



SMILETutor
EFFICIENT . EFFECTIVE . EASY

2022

PRIMARY 5 SCIENCE

TEST PAPERS

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ANGLO-CHINESE SCHOOL (JUNIOR) SA2 PAPER

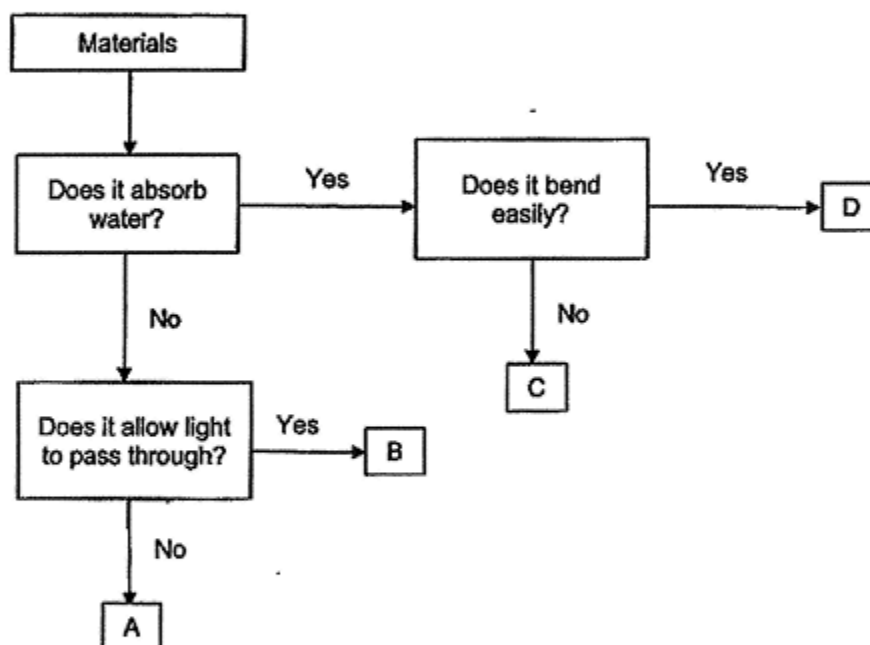
For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). Shade your answer on the Optical Answer Sheet.

(56 marks)

1. Which statement is correct about yeast?

- (1) It is a type of bacteria.
- (2) It is used to make bread.
- (3) It can make its own food.
- (4) It is not a microorganism.

2. Study the flowchart.

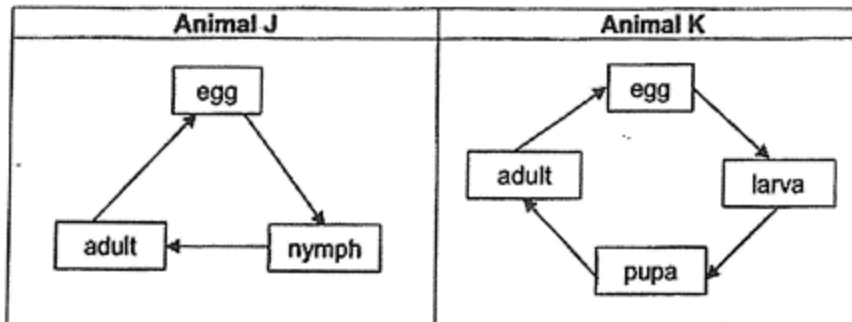


Which material, A, B, C or D, is most suitable to make part X of the sunglasses as shown?



- (1) A
- (2) B
- (3) C
- (4) D

3. Study the life cycles of animals J and K.



Which two statements are true?

- A The larva of animal K eats a lot.
- B Animal J could be a grasshopper.
- C Animal K's young resembles its adult.
- D Both life cycles of animals J and K begin with the egg stage.

- (1) A and B
- (2) A and D
- (3) B and C
- (4) C and D

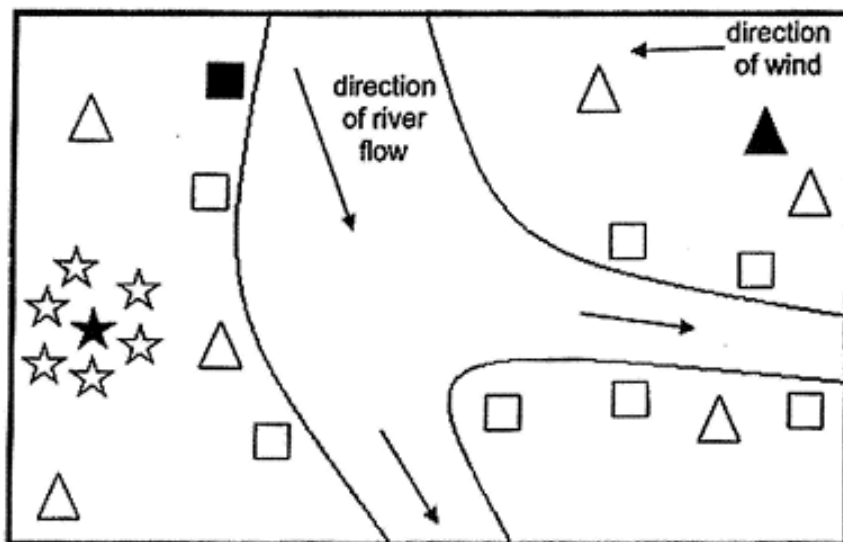
4. Aneesa placed five identical green bean seeds each into four identical containers, A, B, C and D. She placed the containers at different locations as shown and watered the seeds daily for three days.

Container	Location
A	Garden
B	Freezer
C	Dark Cupboard
D	On the kitchen table

In which container(s) will the seeds germinate over the next few days?

- (1) B only
- (2) A and D only
- (3) B and C only
- (4) A, C and D only

5. The diagram shows the seed dispersal patterns of plants A, B and C.



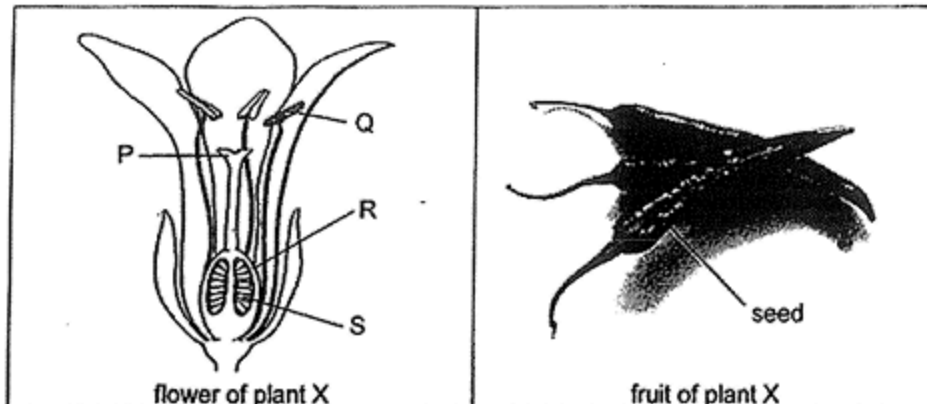
Key :

■ Parent plant A	□ Young plant of A
★ Parent plant B	☆ Young plant of B
▲ Parent plant C	△ Young plant of C

Which of the following characteristics do the fruits/seeds of plants A, B and C have?

	Plant A	Plant B	Plant C
(1)	pod	hooks	wing-like structure
(2)	fibrous husk	pod	hooks
(3)	hooks	wing-like structure	fibrous husk
(4)	wing-like structure	fibrous husk	pod

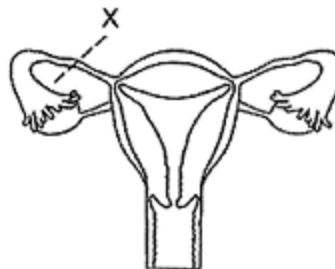
6. The diagram shows the cross-section of a flower and fruit from plant X.



Which parts of the flower did the seed and fruit develop from?

	Seed	Fruit
(1)	P	Q
(2)	Q	P
(3)	R	S
(4)	S	R

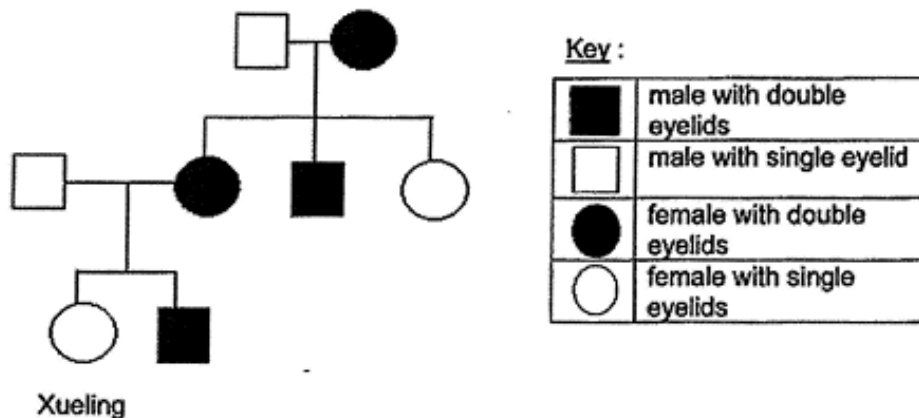
7. The diagram shows the parts of the human female reproductive system. A cut was made at X.



Which of the following statement(s) is/are true?

- A Eggs will not be released.
 - B Fertilization can take place.
 - C Sperms can enter the vagina.
 - D The foetus will not be able to develop.
- (1) D only
 (2) B and C only
 (3) C and D only
 (4) A, B and C only

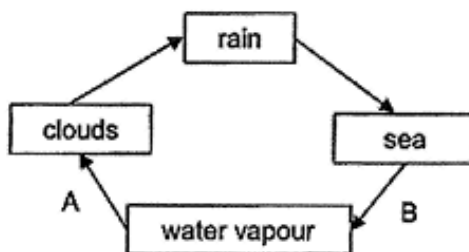
8. Study the family tree.



Which statement about Xueling is true?

- (1) Her aunt has single eyelids.
- (2) Her father has double eyelids.
- (3) Her brother has single eyelids.
- (4) Her grandfather has double eyelids.

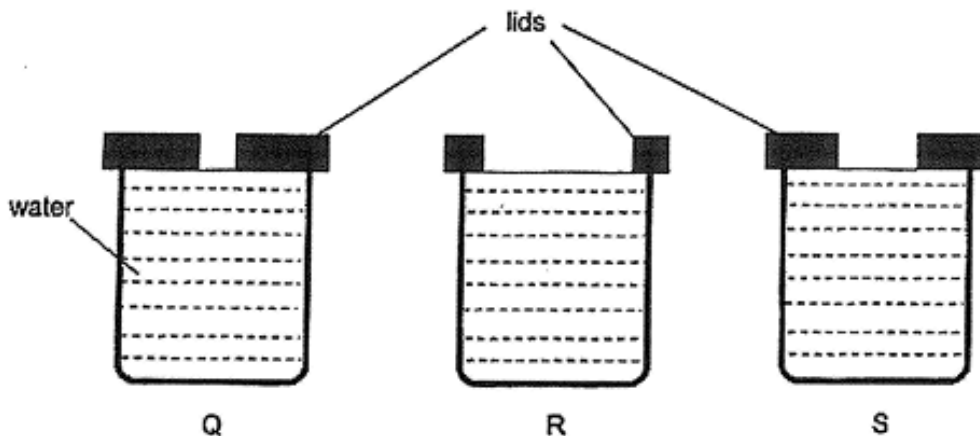
9. The diagram shows the water cycle with processes A and B.



Which statement about process A or B is correct?

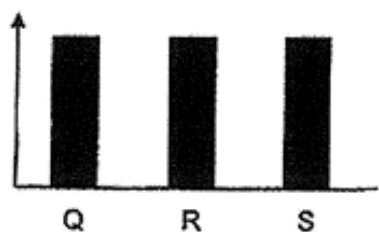
- (1) Water loses heat during process A.
- (2) Water gains heat during process B.
- (3) Process B takes place at a fixed temperature.
- (4) There is no change in the state of matter during process A.

10. Shariq filled identical containers Q, R and S, with 50 ml of water each and covered them with different lids as shown. He left the containers at the Science lab and measured the volume of water left in each container after three hours.

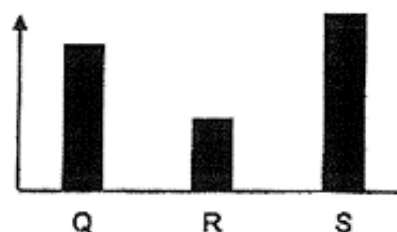


Which of the following graph shows the correct volumes of water left in containers Q, R and S, after three hours?

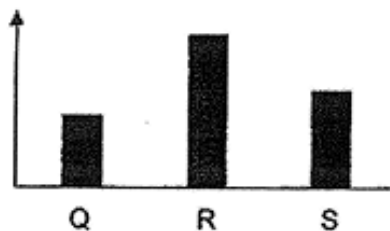
(1) Volume of water left (ml)



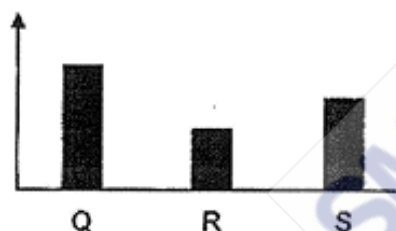
(2) Volume of water left (ml)



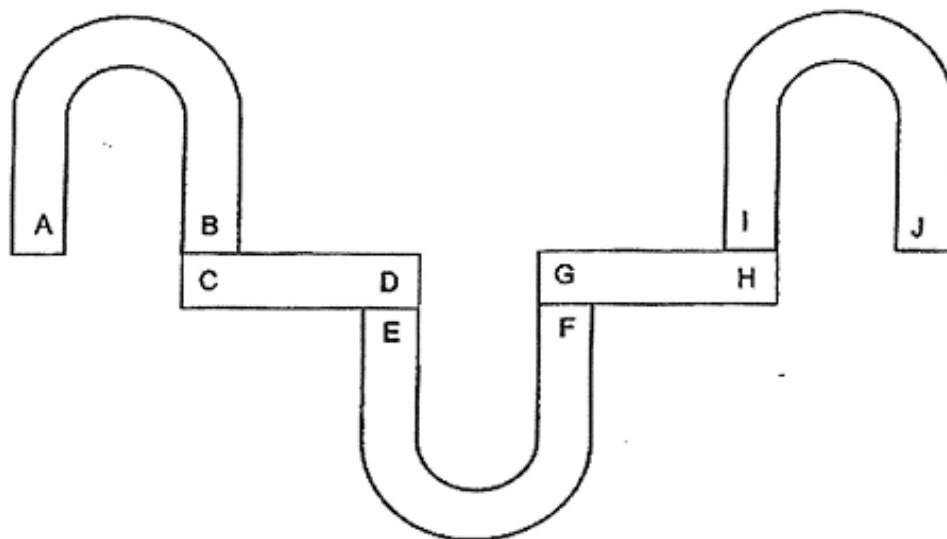
(3) Volume of water left (ml)



(4) Volume of water left (ml)

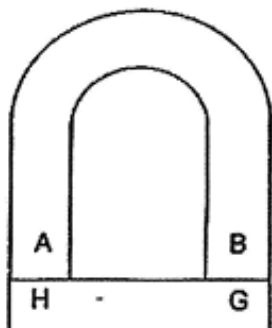


11. The diagram shows the arrangement of five magnets.

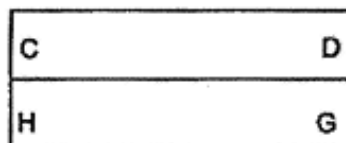


Which of the following arrangements is **not** possible?

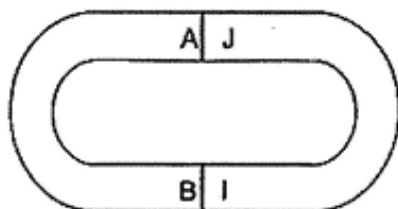
(1)



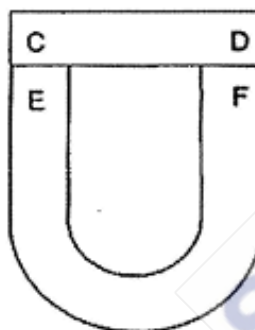
(2)



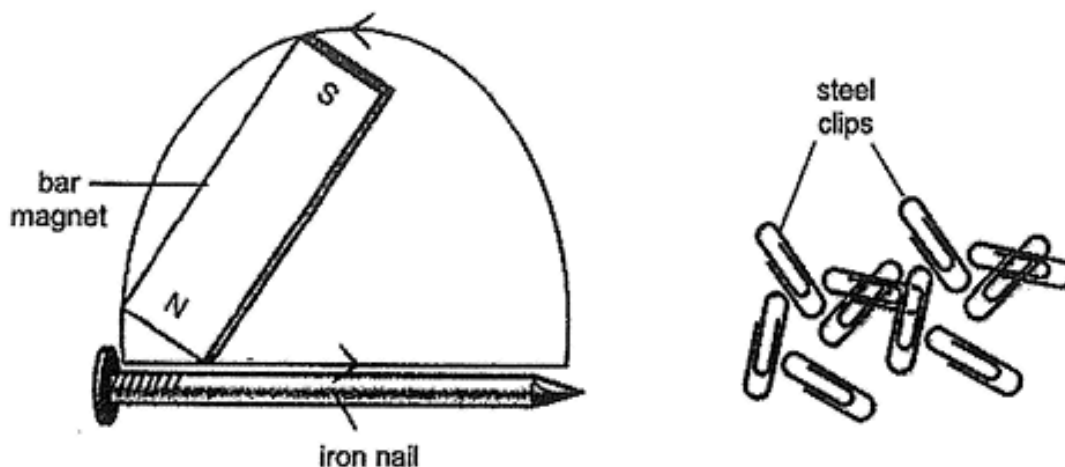
(3)



(4)



12. Adam used the stroke method to make the iron nail into a temporary magnet as shown. He then placed the temporary magnet near some steel clips. Only one steel clip was attracted to the temporary magnet.



What should she do to the temporary magnet so that it can attract more steel clips?

- A Put it over a flame.
- B Drop it from a height.
- C Bring it nearer to the steel clips.
- D Stroke it more times using the North pole of the bar magnet in the same direction.

- (1) C only
- (2) C and D only
- (3) A and B only
- (4) A, B and D only

13. Peter labelled one end of objects J, K, L and M as X. He brought each end of a magnet towards end X of all four objects.



He recorded the interactions in the table as shown.

Object	When North pole of the magnet was brought near end X	When South pole of the magnet was brought near end X
J	Attracted	Attracted
K	No interaction	No interaction
L	Attracted	Repelled
M	Repelled	Attracted

Which of the following statement(s) is/are correct?

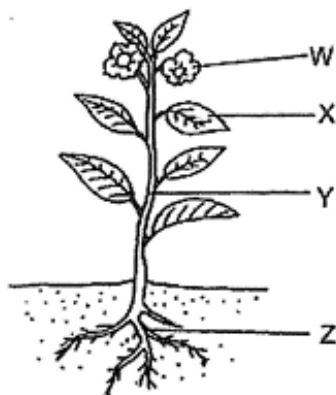
- A Object J is made of aluminium.
- B Objects J, L and M are magnets.
- C Object K is made of a non-magnetic material.

- (1) C only
- (2) A and B only
- (3) A and C only
- (4) A, B and C

14. Which parts of the body are correctly matched to the human organ systems?

	Digestive system	Respiratory system	Skeletal system
(1)	mouth	heart	skull
(2)	stomach	lungs	muscles
(3)	blood vessels	nose	ribcage
(4)	large intestine	windpipe	backbone

15. The diagram shows a plant.

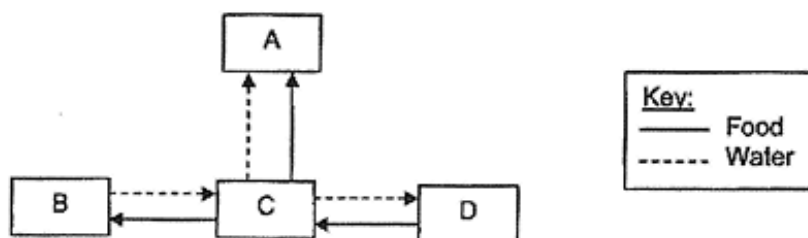


Which statement(s) is/are correct?

- A Part X makes food.
- B Part W contains seeds.
- C Part Y holds the plant upright.
- D Part Z takes in water and mineral salts.

- (1) A only
- (2) B and C only
- (3) A, C and D only
- (4) B, C and D only

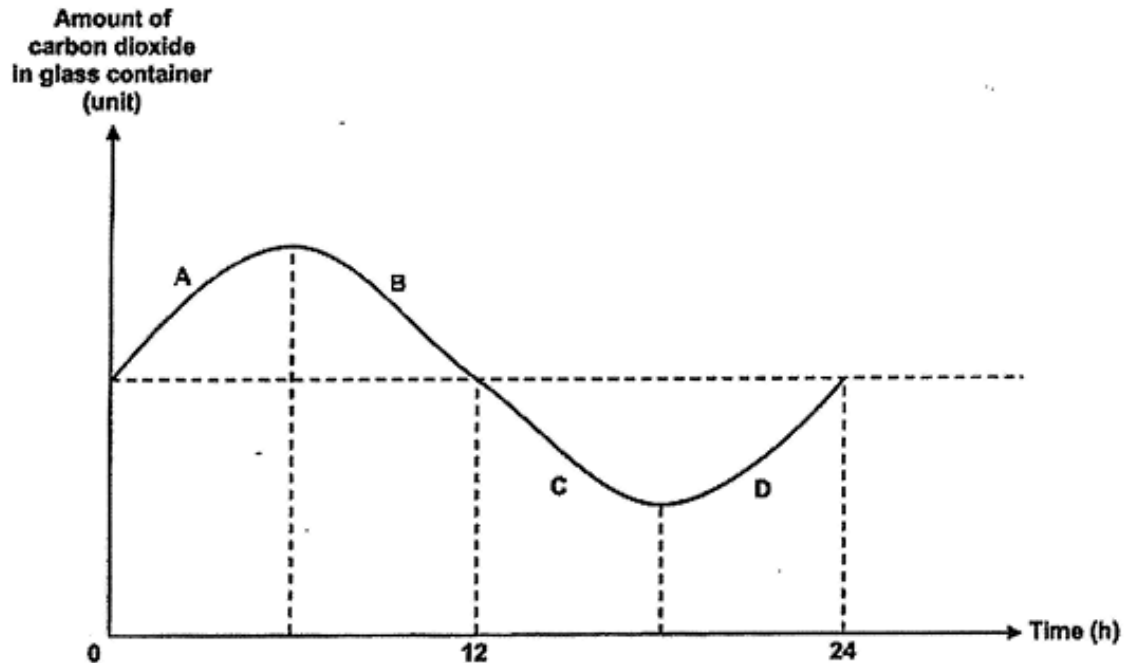
16. The diagram shows the movement of food and water in a plant.



What are parts A, B, C and D?

	A	B	C	D
(1)	Fruit	Roots	Stem	Leaves
(2)	Roots	Stem	Leaves	Fruit
(3)	Fruit	Leaves	Stem	Roots
(4)	Leaves	Stem	Roots	Fruit

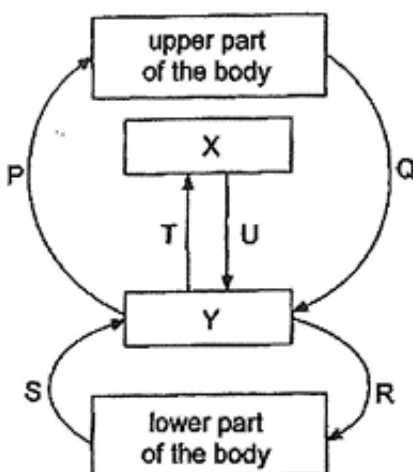
17. A potted plant was placed in a glass container and left in the garden. The amount of carbon dioxide in the glass container was measured and recorded over 24 hours in the graph as shown.



Which two parts of the graph show that the plant was carrying out photosynthesis?

- (1) A and B
- (2) B and C
- (3) C and D
- (4) A and D

18. The diagram shows the flow of blood in the human body. X and Y represent organs in the human body while P, Q, R, S, T and U represent the blood vessels in the body.



Which of the following correctly represents organs X and Y and describes the amount of oxygen and carbon dioxide in the blood of the blood vessels?

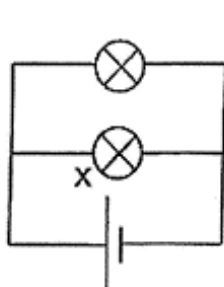
	X	Y	Blood rich in oxygen	Blood rich in carbon dioxide
(1)	Lungs	Heart	P, R and T	Q, S and U
(2)	Heart	Lungs	P, S and T	Q, R and U
(3)	Lungs	Heart	P, R and U	Q, S and T
(4)	Heart	Lungs	Q, R and U	P, S and T

19. The table lists some information about four cell parts.

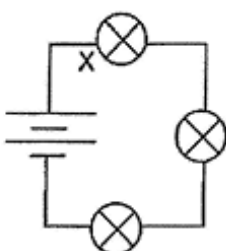
Which of the following is correct?

	Cell part	Function of cell part	Present in animal cell?	Present in plant cell?
(1)	Cytoplasm	Controls the movement of substances in and out of the cell.	Yes	Yes
(2)	Chloroplast	Contains chlorophyll which traps light to make food.	No	Yes
(3)	Cell Membrane	Allows the movement of substances within the cell.	Yes	No
(4)	Cell Wall	Protects the cell and gives it a fixed shape.	Yes	Yes

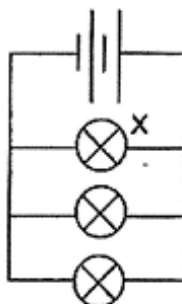
20. Circuits P, Q, R and S are set up using identical batteries and bulbs, which are in working condition.



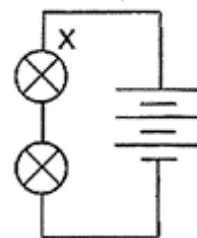
Circuit P



Circuit Q



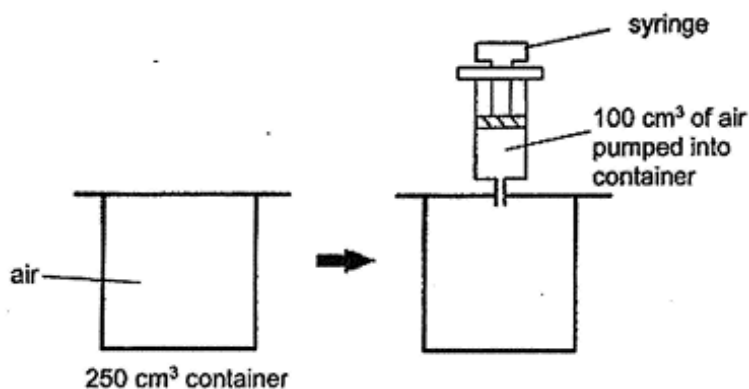
Circuit R



Circuit S

Which of the following shows the correct order of the brightness of bulb X in each circuit, from the dimmest to the brightest?

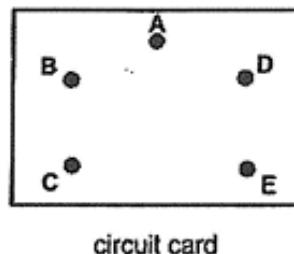
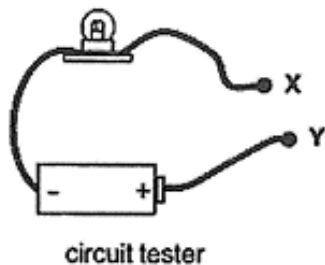
- (1) S, R, Q, P
 - (2) Q, P, S, R
 - (3) P, Q, R, S
 - (4) R, S, P, Q
21. Ari used a syringe to pump 100 cm^3 of air into a container with a volume of 250 cm^3 .



After 100 cm^3 of air was pumped in, which of the following about the mass and volume of air in the container is correct?

	Mass of air in container	Volume of air in container
(1)	increased	increased
(2)	increased	remained the same
(3)	remained the same	increased
(4)	remained the same	remained the same

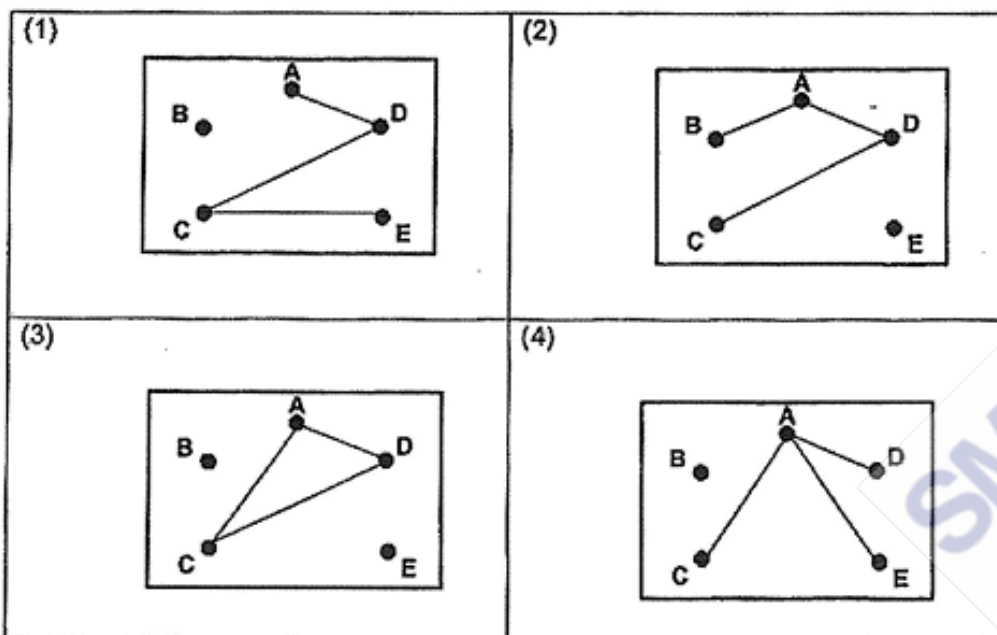
22. Anna used a circuit tester to test a circuit card. She connected points X and Y of the circuit tester to the metal pins A, B, C, D and E on the circuit card and observed if the bulb would light up.



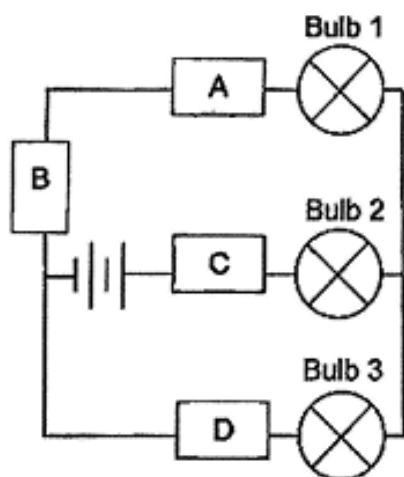
She recorded the results in the table.

Metal pins connected	Did the bulb light up?
A and B	No
A and C	Yes
C and D	Yes
D and E	No

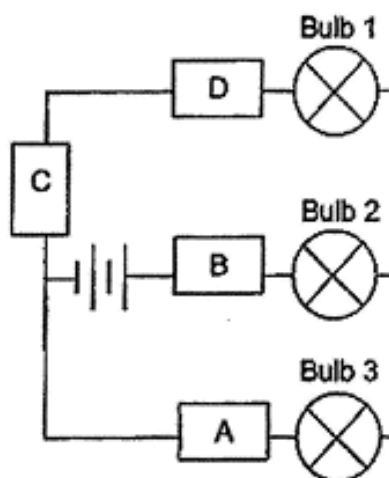
Which circuit card did Anna test?



23. Jeffri sets up two circuits using similar electrical components in working condition and four objects, A, B, C and D, as shown.



Circuit X



Circuit Y

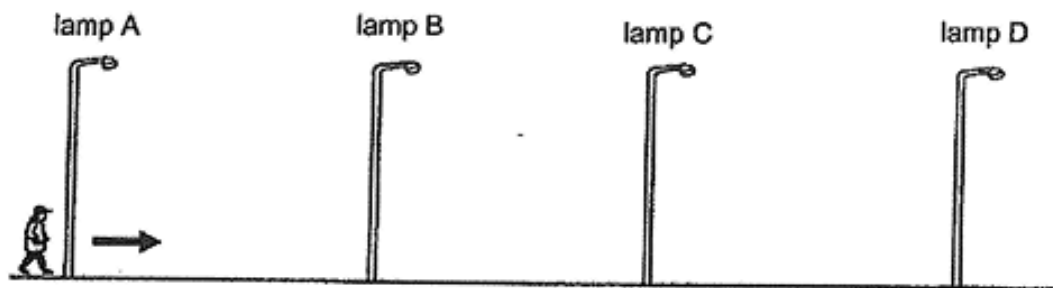
The table shows the results of his experiment.

	Did the bulbs light up?		
	Bulb 1	Bulb 2	Bulb 3
Circuit X	No	No	No
Circuit Y	No	Yes	Yes

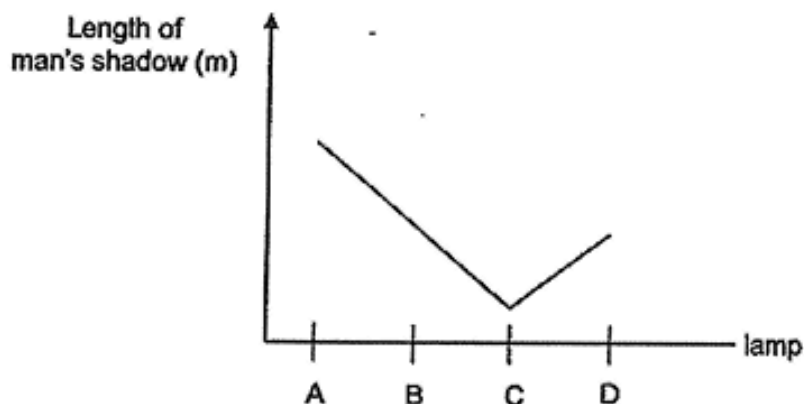
Which one of the following is correct?

	Conductors of electricity	Non-conductors of electricity	Not possible to tell
(1)	A	B	C and D
(2)	A	None	B, C and D
(3)	A and B	C and D	None
(4)	A and B	C	D

24. The diagram shows a man walking down a street from lamp A to lamp D. Of the four street lamps along the street, only one was lighted up. The street lamps were the same distance apart from each other.



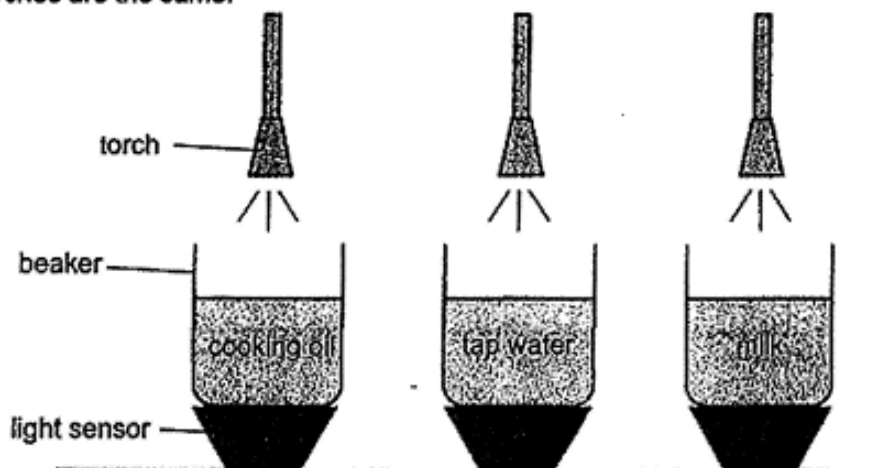
The graph shows how the length of his shadow changes as he walked from lamp A to lamp D.



Based on the graph, which street lamp, A, B, C, or D, was lighted up?

- (1) A
- (2) B
- (3) C
- (4) D

25. Ryan set up an experiment using three identical beakers, each containing a different liquid as shown. The volume of liquid in each beaker and the intensity of light from the torches are the same.

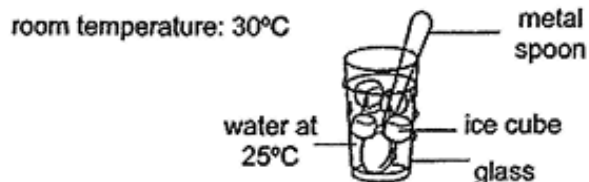


He used identical light sensors, X, Y and Z, to measure the amount of light that passed through each beaker of liquid and recorded the readings.

Which is the most likely reading from the light sensors?

Units of light			
	X	Y	Z
(1)	0	200	100
(2)	200	100	0
(3)	0	100	200
(4)	100	200	0

26. Susie poured herself a glass of water. She then added some ice cubes and a metal spoon to the glass of water as shown.

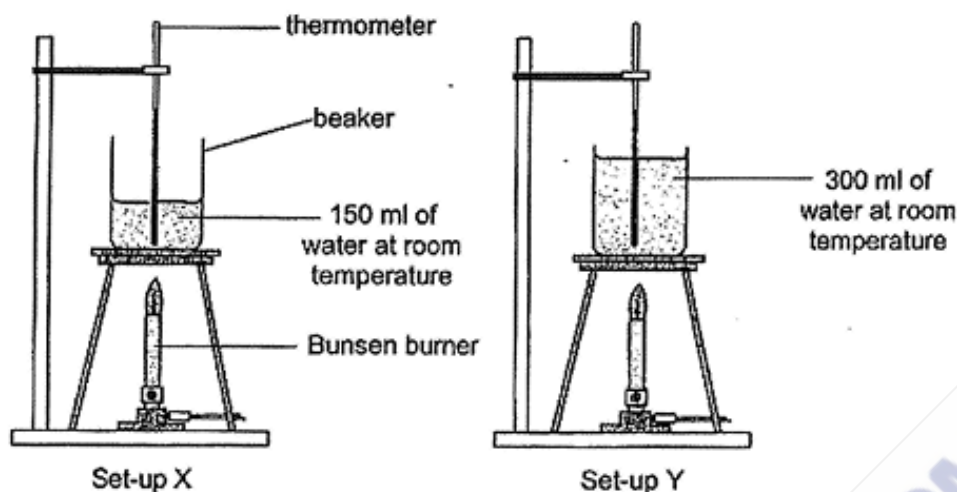


Which two statements are **incorrect**?

- A The glass loses heat to ice cubes.
- B The ice cubes gain heat from the water.
- C The water loses heat to the surrounding air.
- D The metal spoon gains heat from the ice cubes.

- (1) A and B
- (2) B and C
- (3) C and D
- (4) A and D

27. An experiment was carried out using the two identical set-ups with different volumes of water as shown. The Bunsen burners were turned on at the same time to heat the water in the beakers until the water reached 100°C.



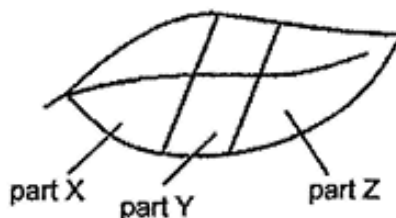
Which statement is correct?

- (1) Water in both set-ups have the same amount of heat.
- (2) Water in both set-ups reached 100°C at the same time.
- (3) Water in Set-up X has more heat than the water in Set-up Y.
- (4) Water in Set-up X will reach 100°C faster than the water in Set-up Y.

28. The diagram shows a leaf of a plant partially covered with black paper on both sides of the leaf.



The plant was then placed in an area with plenty of sunlight and given sufficient water daily. After five days, the same leaf was tested for starch using iodine solution. Iodine solution changes from brown to blue-black in the presence of starch.



Which part(s) of the leaf would the iodine solution remain brown?

- (1) Part X only
- (2) Part Y only
- (3) Parts X and Z only
- (4) Parts X, Y and Z only

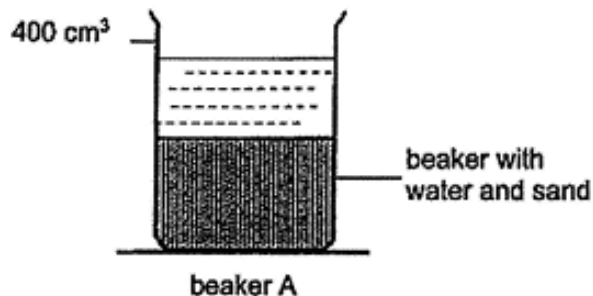
End of Booklet A

For questions 29 to 41, write your answers in this booklet.

The number of marks available is shown in brackets [] at the end of each question or part question.

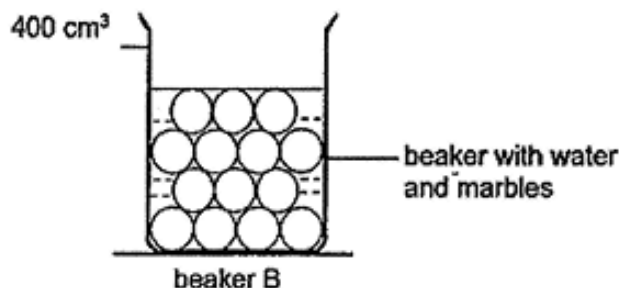
(44 marks)

29. Falisha placed 200 cm^3 of sand into beaker A and poured in 200 cm^3 of water as shown.



- (a) State the property of water that allowed it to be poured into beaker A. [1]

She repeated the experiment by placing 200 cm^3 of marbles and 200 cm^3 of water into beaker B as shown.

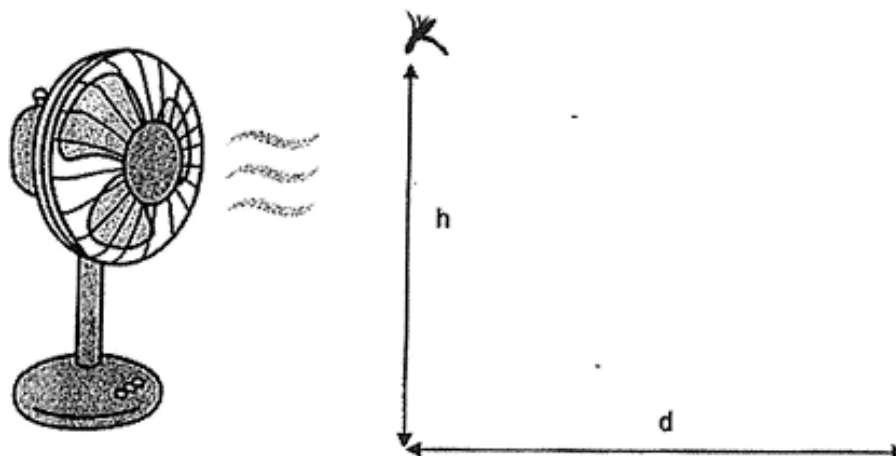


- (b) She noticed that the water level in beaker B is lower than that of beaker A. Explain why. [2]

30. Devi conducted an experiment and prepared three identical fruits, A, B and C, with different numbers of structure X.



She dropped each fruit from the same height, h , in front of a fan as shown. She measured the distance, d , travelled by each fruit.



She recorded her results in the table shown.

Fruit	Number of structure X on the fruit	Distance (d) travelled by the fruit (cm)
A	5	137
B	3	72
C	1	15

- (a) What is the aim of Devi's experiment?

[1]

- (b) State an advantage to the young plant when the fruit travels a further distance from the parent plant.

[1]

- (c) Devi then wanted to find out how the speed of wind affects the distance the fruit travelled.

Identify the variables that should be kept the same to test this new aim. Place a tick (✓) in the correct boxes in the table.

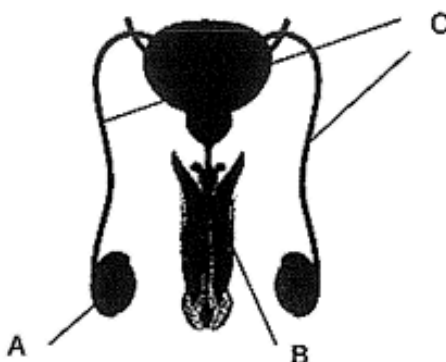
[1]

Variables		Keep the same
(i)	Type of fruit	
(ii)	Wind speed	
(iii)	Number of structure X	
(iv)	Height that the fruit is dropped	

31. (a) Describe the process of pollination in flowering plants.

[1]

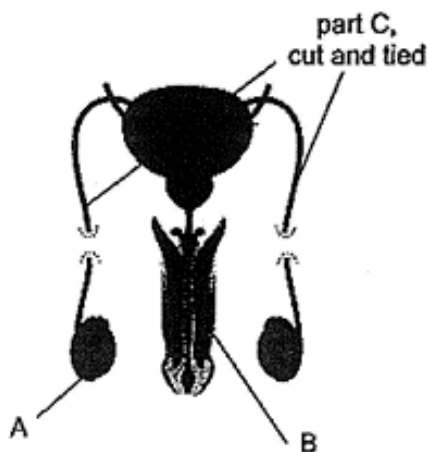
The diagram shows parts A, B and C of the male reproductive system. Part C connects parts A and B where sperms can travel through.



- (b) Which part of the male reproductive system, A, B or C, has the same function as the anther in a flowering plant?

[1]

To prevent reproduction from taking place, adult males go through a medical surgery where part C is cut and tied as shown.

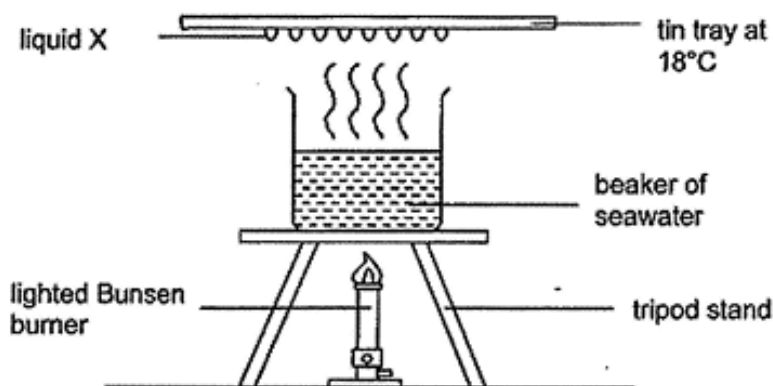


- (c) Give a reason why reproduction cannot take place after part C has been cut and tied.

[1]

32. (a) State one difference between boiling and evaporation of a liquid. [1]

Nirdesh heated a beaker of seawater at 27°C . As the water started boiling, he placed a tin tray at 18°C above the beaker of water as shown in the diagram.



- (b) Nirdesh noticed liquid X forming on the underside of the tin tray. What is liquid X? [1]

- (c) Without increasing the heat from the Bunsen burner, suggest what Nirdesh can do so that liquid X forms at a faster rate on the underside of the tray. [1]

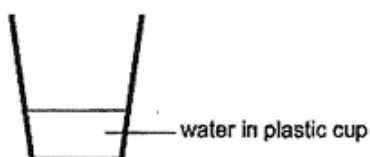
33. Hannah placed some ice cubes in a plastic cup. After five minutes, she noticed that the ice cubes were still melting.



- (a) Name the state(s) of matter present in the cup at the fifth minute.

[1]

After two hours, Hannah observed that the ice cubes have completely melted.



- (b) Without removing the water from the plastic cup, suggest what Hannah could have done so that there will be less water in the cup at the end of two hours. Explain your answer.

[2]

Suggestion: _____

Explanation: _____

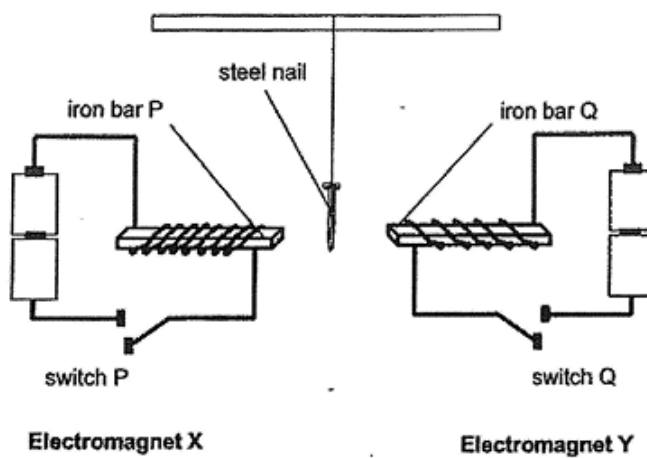
Whilst visiting Switzerland during winter, Hannah noticed that a white 'mist' formed whenever she exhaled.



- (c) Explain clearly how the white 'mist' was formed when Hannah exhaled.

[2]

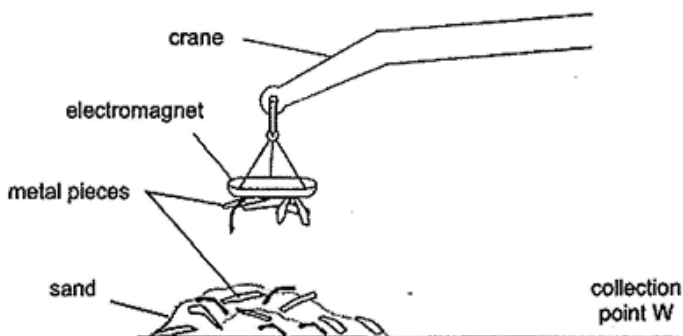
34. Chloe sets up two electromagnets using identical batteries in working condition, wires and iron bars, P and Q, as shown. A steel nail is freely suspended at an equal distance between electromagnets X and Y.



When Chloe closed both switches, P and Q, at the same time, the steel nail moved towards iron bar P.

- (a) Give a reason why the steel nail moved towards iron bar P when both switches P and Q were closed at the same time. [1]

The diagram shows part of a crane that uses an electromagnet to collect metal pieces for recycling.

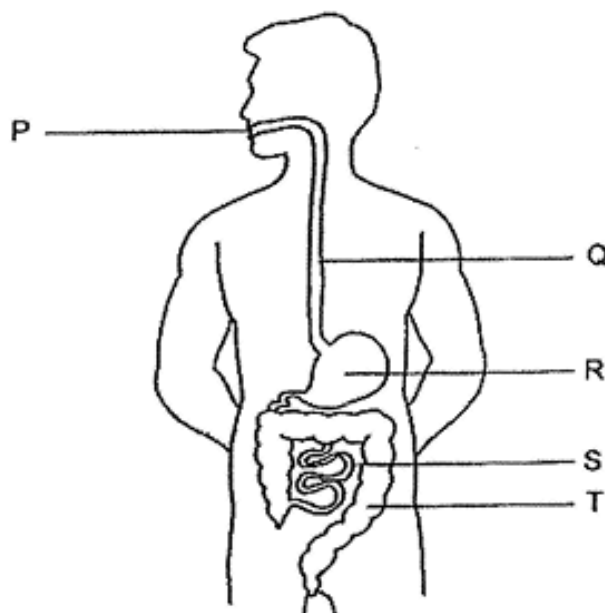


- (b) Explain how the electromagnet of the crane is used to move the metal pieces in the sand to the collection point W in the diagram above. [2]

35. (a) State what digestion is.

[1]

The diagram shows the human digestive system.



(b) State the part(s) which carry out the following functions by writing the letters P, Q, R, S or T in the boxes provided.

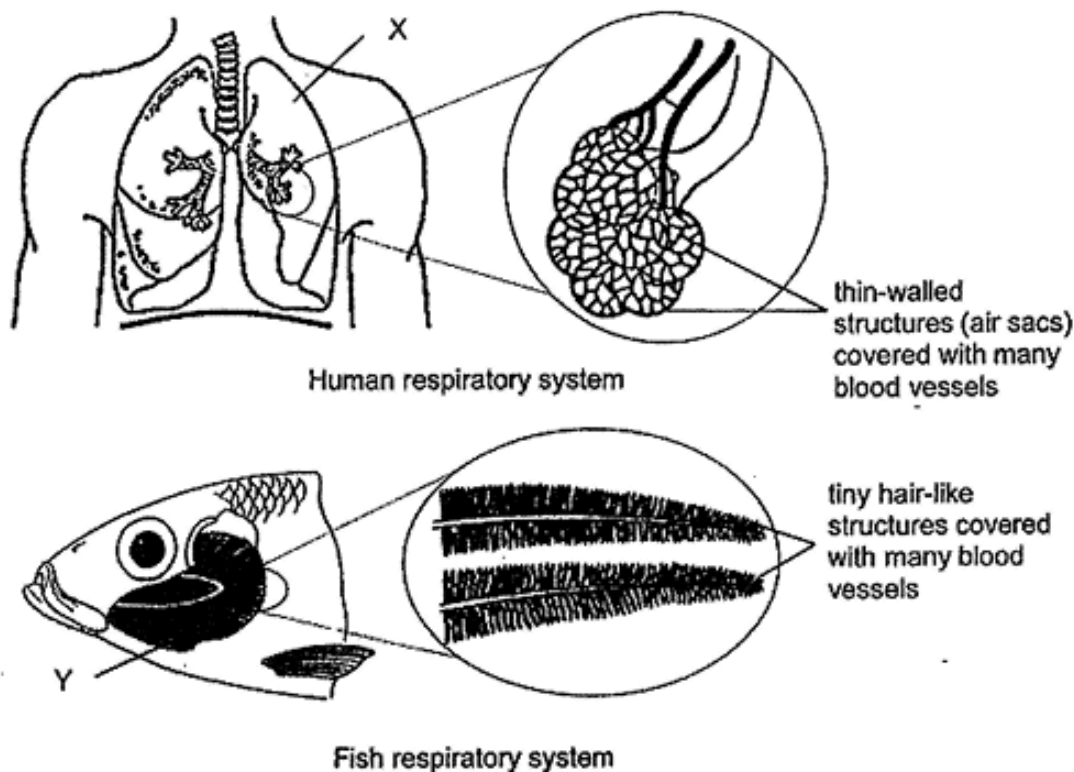
[1]

	Function	Part(s)
(i)	Produces digestive juice	
(ii)	Absorbs water from undigested food	

(c) Describe what happens to digested food at part S.

[1]

36. The diagrams show the respiratory systems of a human and a fish.



- (a) Name organs X and Y of the human and fish respiratory system. [1]

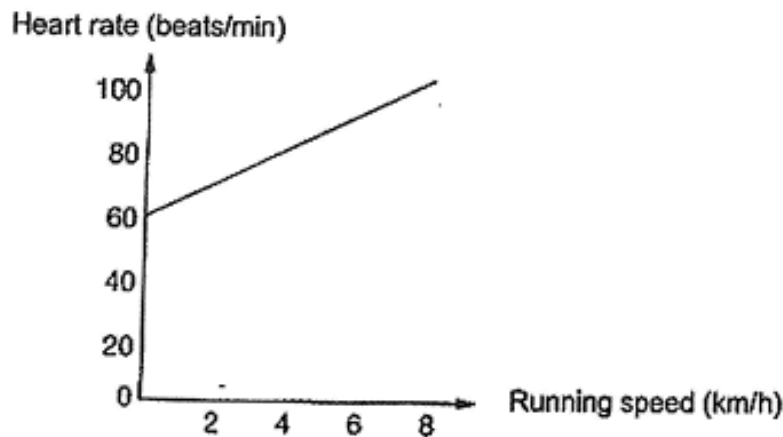
X: _____

Y: _____

- (b) State how the structures covered with many blood vessels in the human and fish respiratory system help in the absorption of oxygen. [1]

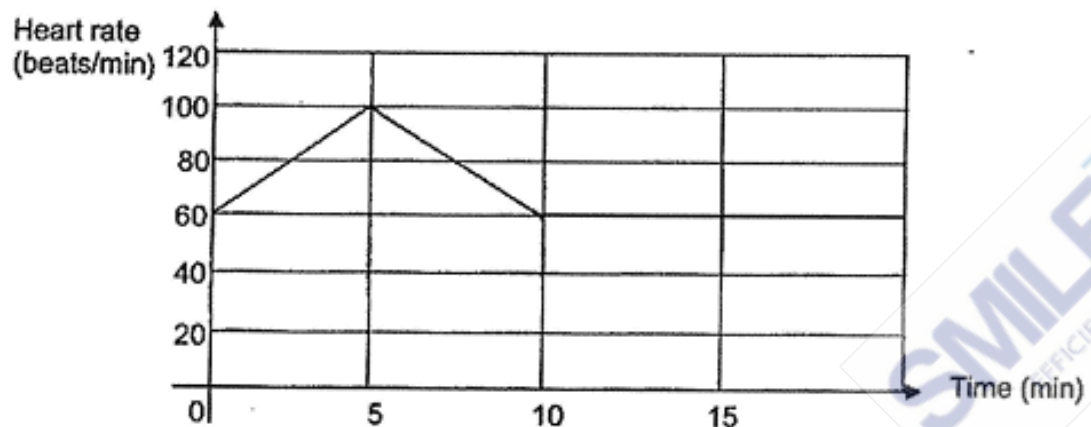
- (c) Describe how oxygen in the environment reaches the blood vessels of the human respiratory system. [1]

37. Jack's resting heart rate is 60 beats per minute. The graph shows the changes in Jack's heart rate as he runs faster on the treadmill.

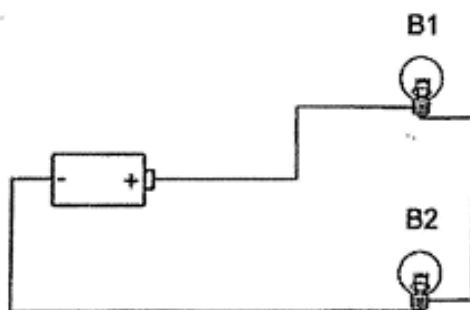


- (a) Explain why Jack's heart rate increases as his running speed increases. [2]

- (b) After running for five minutes, Jack stopped running and sat down to rest for ten minutes. Complete the line graph below to show the changes in Jack's heart rate for the next 10 minutes after he stopped running. [1]



38. The diagram shows a closed circuit. The bulbs and batteries used are in working condition.



- (a) How are the bulbs B1 and B2 arranged? [1]

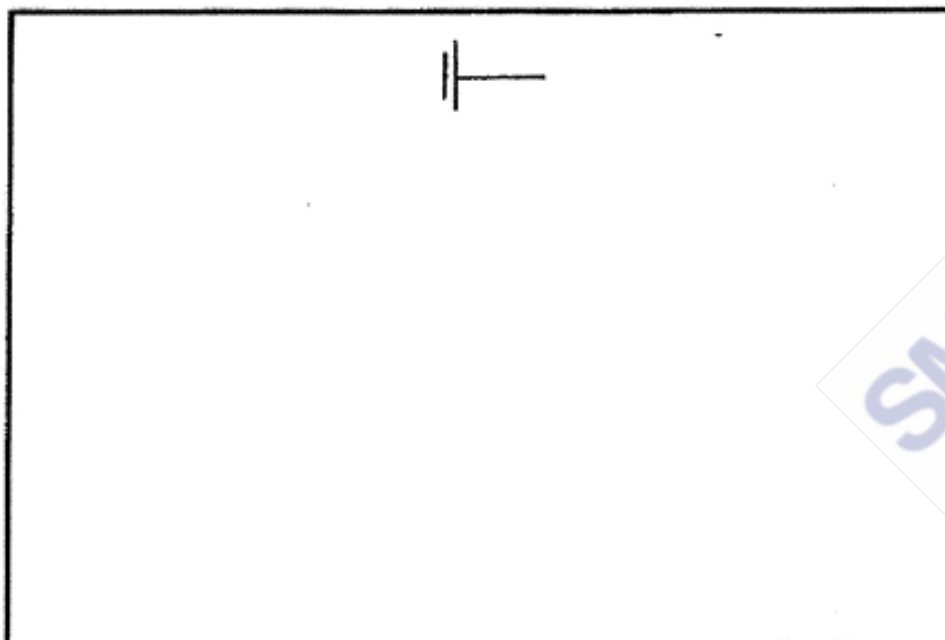
- (b) State one disadvantage of the arrangement of bulbs in (a). [1]

- (c) Using the same electrical parts and an **additional switch**, draw a closed circuit diagram based on the following conditions:

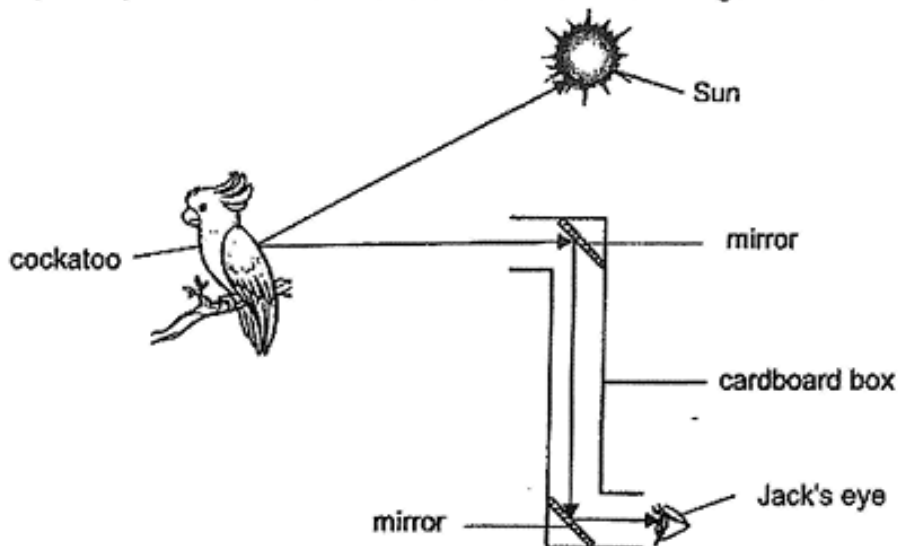
- B1 remains lit all the time
- B2 is controlled by the switch

[2]

Label bulbs, B1 and B2, in your circuit diagram.



39. Jack made a simple periscope using a cardboard box and two small mirrors as shown. The periscope allows him to see the cockatoo while remaining hidden.



- (a) Jack drew arrows to represent light rays that enable him to see the cockatoo on the diagram. However, he drew one of the arrows wrongly. Circle the arrow which has been drawn **wrongly**. [1]

- (b) State two properties of light that allow Jack's periscope to work. [2]

Property 1: _____

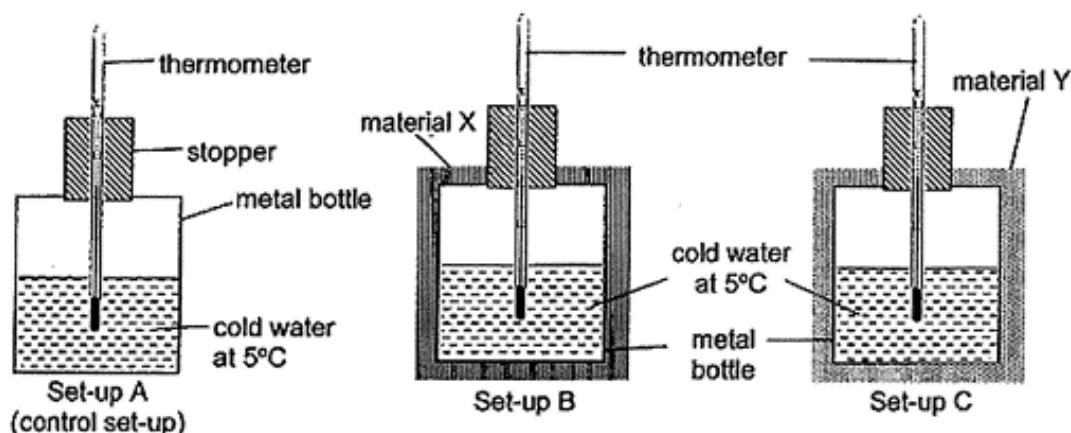
Property 2: _____

- (c) Jack's classmate, Tessa, told him that light is not matter. Give two reasons why Tessa said so. [1]

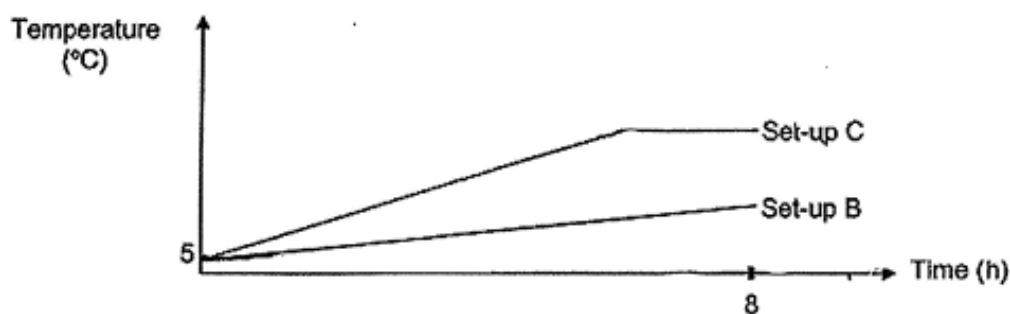
Reason 1: _____

Reason 2: _____

40. Tom prepared three set-ups, A, B and C, with three identical metal bottles containing equal volumes of cold water at 5°C as shown. Set-ups B and C were covered with material X and material Y.



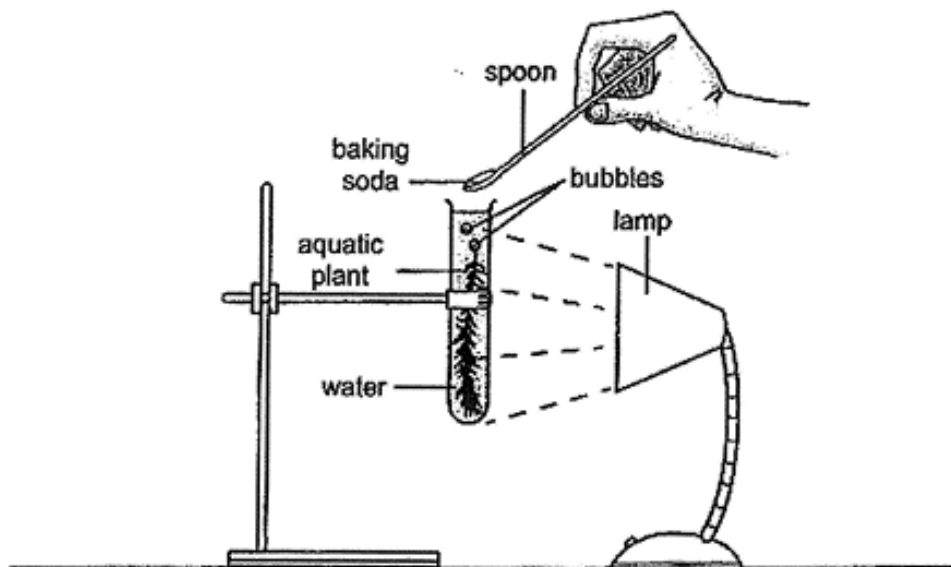
Tom recorded the temperature of the water in set-ups B and C over eight hours in the graph as shown.



- Draw a line in the graph above to show the change in the temperature of the cold water in set-up A over eight hours. [1]
- Compare the rate of heat gain between the water in set-up B and set-up C. [1]
- Which material, X or Y, is more suitable for making a container to keep food warm for a longer period of time? Give a reason. [1]
- What is the purpose of the control set-up? [1]

41. Sally set up an experiment to find out how the amount of carbon dioxide affects the rate of photosynthesis in an aquatic plant as shown.

She added a spoonful of baking soda to the water in the test tube to increase the amount of dissolved carbon dioxide in the water.



After adding the baking soda, she counted the number of bubbles produced by the aquatic plant in five minutes. She repeated the experiment by adding different number of spoonfuls of baking soda to the water and recorded the results in the table.

Number of spoonfuls of baking soda added to the water	1	2	3	4	5	6	7
Number of bubbles produced by the aquatic plant	2	3	5	8	12	12	12

- (a) What is the relationship between the number of spoonfuls of baking soda added to the water and the number of bubbles produced by the aquatic plant? [2]

- (b) Sally kept the distance between the lamp and the aquatic plant the same throughout the experiment. Explain why this ensures a fair test. [1]

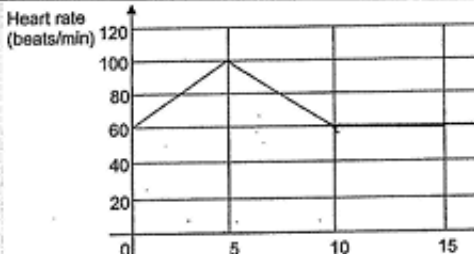
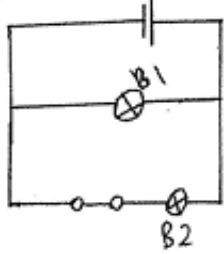
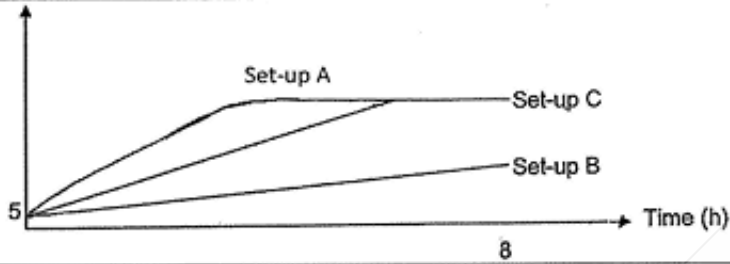
ANSWER SHEET

BOOKLET A

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
2	2	1	4	2	4	2	1	2	4
Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
4	2	1	4	3	1	2	3	2	2
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28		
1	3	4	3	4	3	4	2		

BOOKLET B

Q29a)	Water has no definite shape.
Q29b)	The air spaces between the marbles in beaker B are bigger compared to the air spaces between the sand particles in beaker A. Thus, more water fill up the bigger air spaces in beaker B and the water level in beaker B is lower than that of beaker A.
Q30a)	To find out how the number of structure X on the fruit affects the distance travelled by the fruit.
Q30b)	The young plant would not need to compete with its parent plant for sunlight, water, nutrients and space.
Q30c)	Type of fruit Number of structure X Height that the fruit is dropped
Q31a)	Pollination is the transfer of pollen grains from the anther to the stigma.
Q31b)	A
Q31c)	When part C has been cut and tied, the sperms produced by A are unable to travel up part C to be released through B.
Q32a)	Boiling occurs at a fixed temperature but evaporation occurs at any temperature.
Q32b)	Water droplets
Q32c)	Use a cooler tin tray / tin tray with a lower temperature.
Q33a)	Solid, liquid, gas
Q33b)	Suggestion: Use a fan to blow at the water in the cup. Explanation: The wind from the fan would increase the rate of evaporation of water in the cup.
Q33c)	Warm water vapour exhaled by Hannah came into contact with the cooler surrounding air, lost heat and condensed into water droplets which appeared as white 'mist'.
Q34a)	There are more coils of wires around iron bar P than Q. When both switches were closed at the same time, iron bar P became a stronger electromagnet / had more magnetic strength than Q. Thus, the steel nail would be attracted to iron bar P more than Q and moved towards iron bar P.
Q34b)	When the switch is closed, the circuit is a closed circuit. The electromagnet would be magnetised to attract the metal pieces from the sand and the crane would bring it to collection point W. When the crane reaches collection point W, the switch would be opened to form an open circuit. The electromagnet would be demagnetized and not attract the metal pieces anymore, allowing the metal pieces to drop at collection point W.

Q35a)	Digestion is the process of breaking down food into simpler substances.
Q35b)	(i) P, R, S (ii) T
Q35c)	Digested food would be absorbed into the blood through the walls of part S.
Q36a)	X: Lungs Y: Gills
Q36b)	There would be increased surface area of contact between the blood and oxygen to increase the rate of absorption of oxygen.
Q36c)	Air in the surrounding enters the nose and into the lungs where oxygen is absorbed into the blood.
Q37a)	When Jack's running speed increases, his body needs more energy. His heart would pump blood faster to transport more oxygen and digested food to other parts of his body for a faster rate of respiration to release more energy.
Q37b)	 <p>Heart rate (beats/min)</p> <p>Time (min)</p>
Q38a)	They are arranged in series.
Q38b)	If one bulb fuses, the other bulb would not light up.
Q38c)	 <p>(B1 and B2 must be arranged in parallel)</p>
Q39a)	Circle the arrow pointing towards the Sun.
Q39b)	Light travels in a straight line. Light can be reflected.
Q39c)	Light does not occupy space. Light has no mass.
Q40a)	 <p>Temperature (°C)</p> <p>Time (h)</p> <p>Set-up A</p> <p>Set-up C</p> <p>Set-up B</p>
Q40b)	The rate of heat gain in set-up C is faster than in set-up B
Q40c)	X. Since the water in Set-up B gains heat slower than Set-up C, X is a poorer conductor of heat than Y and can keep food warm longer.

Q40d)	To compare and confirm that the rate which the water in the containers gain heat is only affected by the type of material that covers the container.
Q41a)	When the number of spoonfuls of baking soda added to the water increases from 1 to 5, the number of bubbles produced by the aquatic plant increases. When the number of baking soda added to the water increases from 5 to 7, the number of bubbles produced by the aquatic plant remains the same.
Q41b)	This is to ensure that only the number of spoonfuls of baking soda added to the water affects the number of bubbles produced by the aquatic plant.

AI TONG SCHOOL EOY PAPER

Section A (28 x 2 marks)

For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice and shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet.

1. The diagrams show two animals.



How are the animals similar?

- (1) have fur
 - (2) have dry skin
 - (3) breathe through lungs
 - (4) reproduce by laying eggs
2. The table below shows some information on three cells, D, E and F.
A tick (✓) indicates the presence of the part of a cell.

Part	Cell D	Cell E	Cell F
Cell Membrane	✓	✓	✓
Nucleus		✓	✓
Chloroplasts		✓	
Cell Wall		✓	✓
Cytoplasm	✓	✓	✓

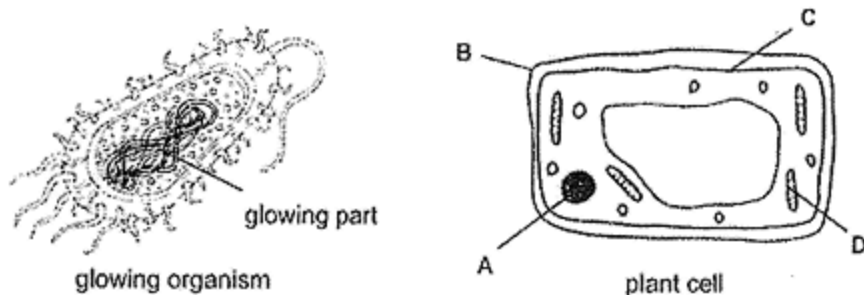
Fatimah wrote some statements about the cells.

- A Cells D, E and F can reproduce.
- B Only Cell D has an irregular shape.
- C Cell E and Cell F come from the same part of the plant.

Which of her statement(s) is/are correct?

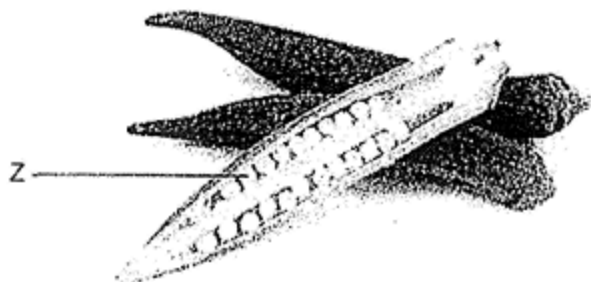
- (1) B only
- (2) A and B only
- (3) A and C only
- (4) A, B and C

3. A group of scientists recently discovered a glowing organism in the ocean. They took out the part that helps it to glow and put it into a plant cell, hoping to get a young plant that produces light.



Where should the scientists insert the glowing part?

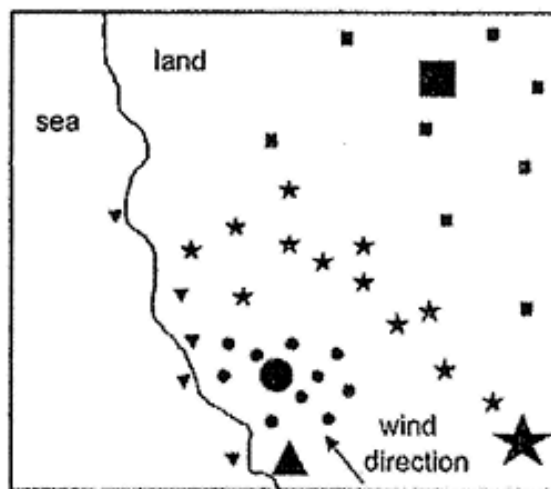
- (1) A
 - (2) B
 - (3) C
 - (4) D
4. The diagram below shows the fruits of a plant.



Which of the following statements about Z are true?

- A They help in dispersal.
 - B They can grow into new plants.
 - C They are the pollen grains of the flower.
 - D They are formed from the ovules of the flower.
- (1) A and C only
 - (2) A and D only
 - (3) B and C only
 - (4) B and D only

5. The map below shows the distribution of four plants, represented by ■, ●, ▲ and ★.



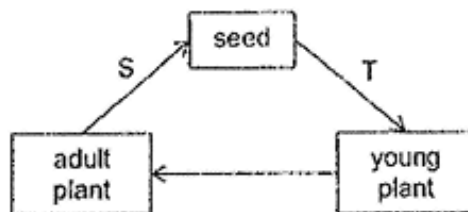
Legend

Parent	Young
★	★
■	■
●	●
▲	▲

How are the plants most likely to be dispersed?

	●	■	★	▲
(1)	animal	splitting	water	wind
(2)	splitting	animal	wind	water
(3)	water	animal	wind	splitting
(4)	wind	splitting	water	animal

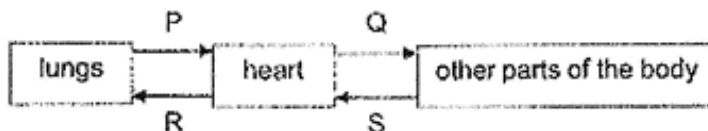
6. The diagram below shows the life cycle of a flowering plant.



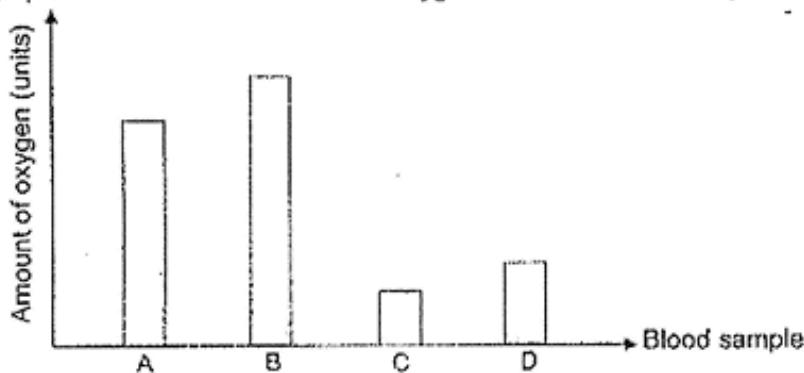
Which of the following shows the correct processes taking place at S and T?

	S	T
(1)	germination and fertilisation	pollination and seed dispersal
(2)	pollination and fertilisation	seed dispersal and germination
(3)	fertilisation and seed dispersal	germination and pollination
(4)	seed dispersal and germination	pollination and fertilisation

7. The diagram below shows the movement of blood in the human circulatory system.



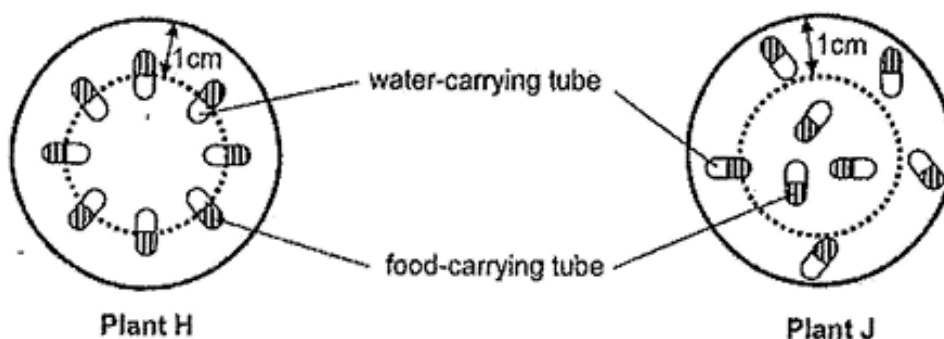
Blood was drawn from the four different blood vessels, P, Q, R and S, in the body. The graph below shows the amount of oxygen in the four blood samples.



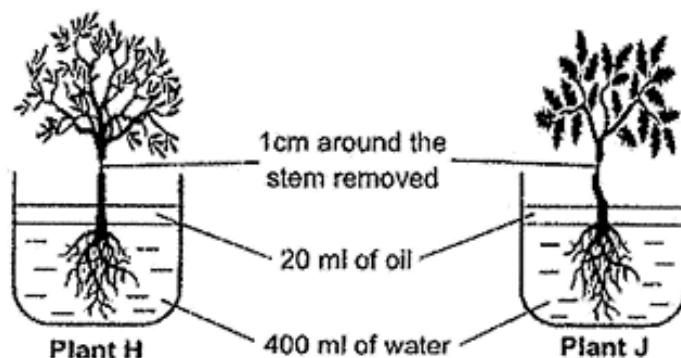
Based on the graph above, which one of the blood samples was taken from vessel S of the circulatory system shown in the diagram above?

- (1) Blood sample A
- (2) Blood sample B
- (3) Blood sample C
- (4) Blood sample D

8. The cross-sections of the stem of plants H and J are shown below.



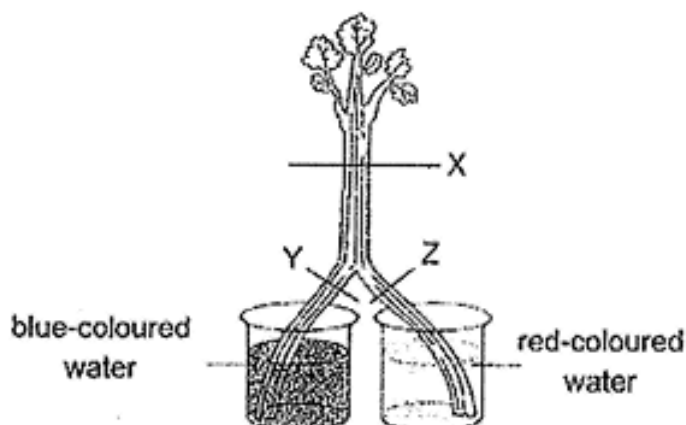
Nicholas removed 1cm around each stem and put the plants into beakers of water. The amount of water in each container is the same at the start of the experiment.



Which of the following results will Nicholas observe after five days?

	Amount of water left in container with plant H (ml)	Amount of water left in container with plant J (ml)
(1)	350	350
(2)	350	370
(3)	370	350
(4)	400	400

9. Clara placed half of a split celery stalk into a beaker containing red-coloured water and the other half of the stalk into a beaker containing blue-coloured water. After a few hours, she cut across at positions X, Y and Z, as shown below.



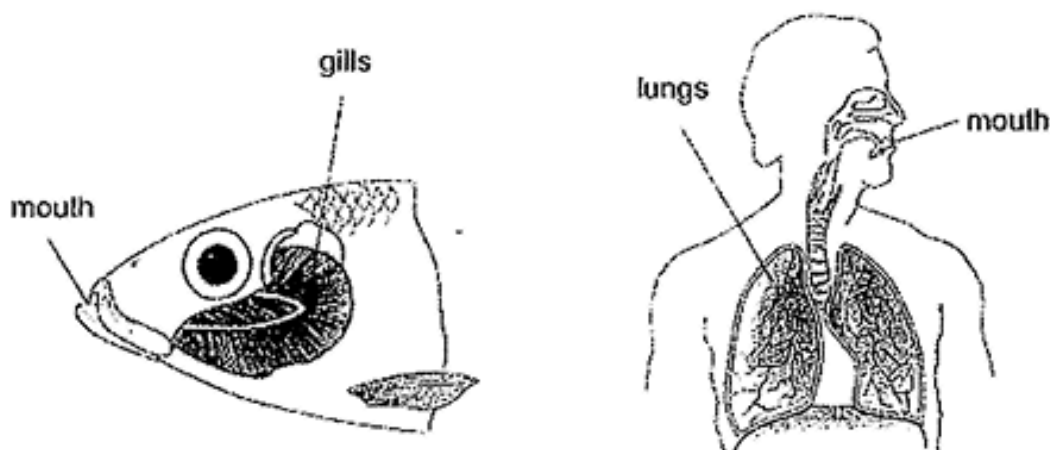
She noticed that the cross-section cuts at X, Y and Z contained coloured dots.



Which one of the following shows the possible colours of the dots at X, Y and Z?

	X	Y	Z
(1)	purple	blue	red
(2)	purple	red	blue
(3)	red and blue	red	blue
(4)	red and blue	blue	red

10. The diagram below shows the respiratory systems of a fish and a human.

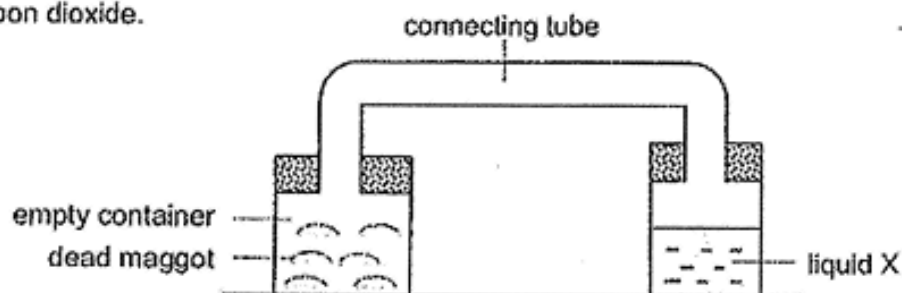


How are the respiratory systems similar?

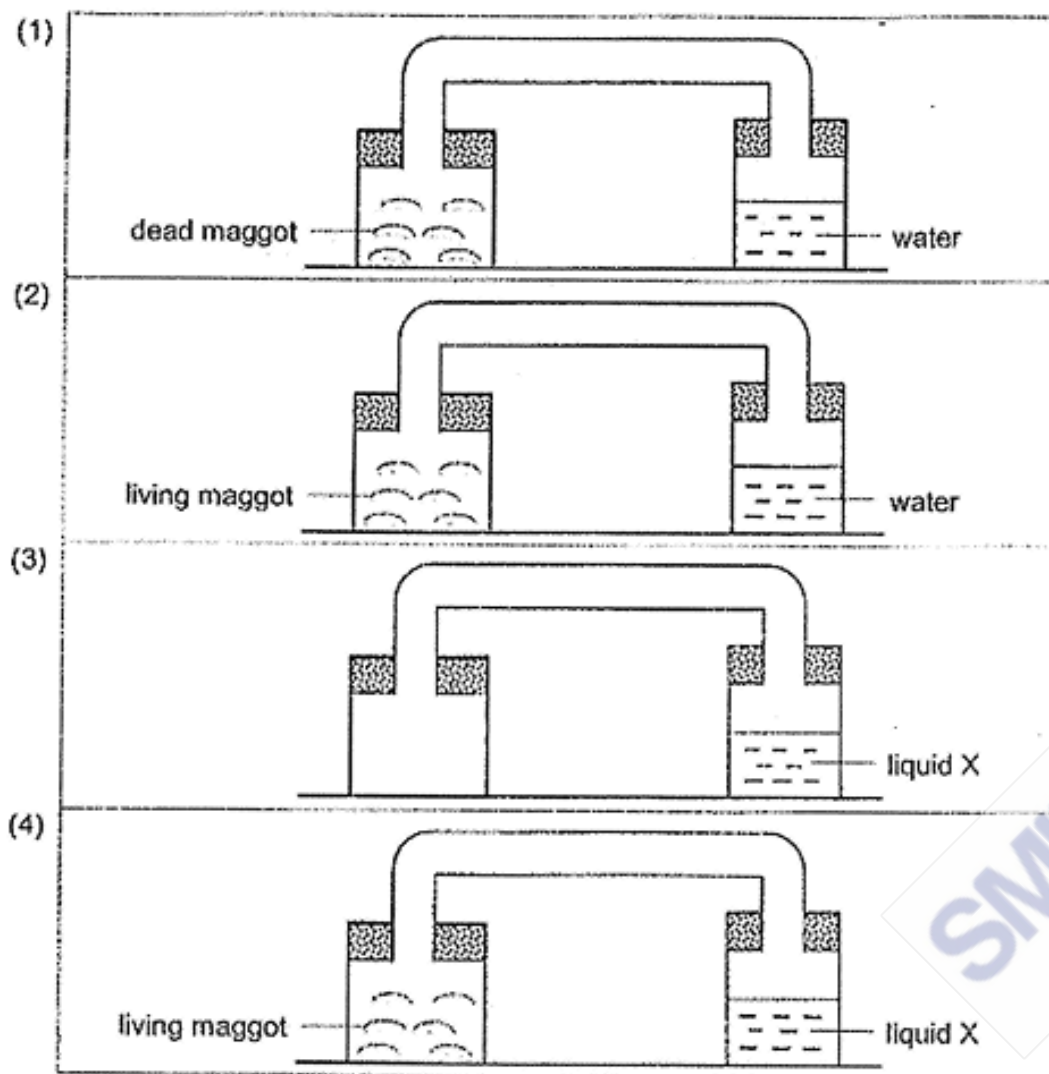
- A Both the gills and lungs take in air from the surroundings.
- B Both the gills and lungs remove carbon dioxide from the body.
- C Both the fish and human remove carbon dioxide through their mouths.

- (1) A and B only
- (2) A and C only
- (3) B and C only
- (4) A, B and C

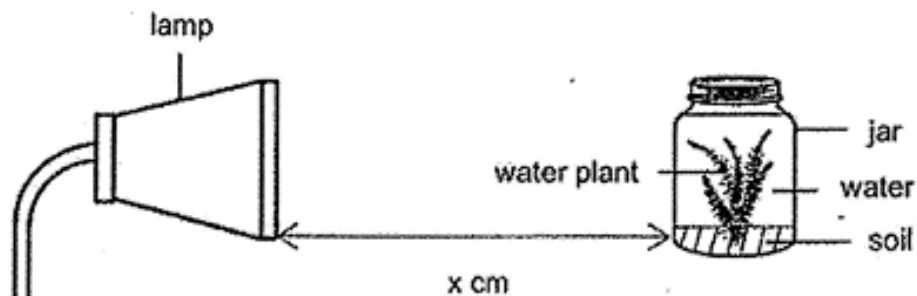
11. Karen wanted to find out if dead maggots produce carbon dioxide. She placed a few dead maggots in an empty container and attached it with a connecting tube to a container of liquid X as shown below. Liquid X turns chalky in the presence of carbon dioxide.



Which of the following set-ups could be used as a control for Karen's experiment?



12. Hasim had a glass jar containing a water plant immersed in the water. He placed the jar at a distance x cm from a lamp as shown in the diagram below. The experiment was carried out in a dark room.



He switched on the lamp and counted the number of bubbles produced by the water plant in one minute. He repeated the experiment by placing the jar at y cm and z cm from the lamp and the results are shown in the table below.

Distance between the jar and the lamp (cm)	Number of bubbles produced by the water plant in one minute
x	19
y	11
z	29

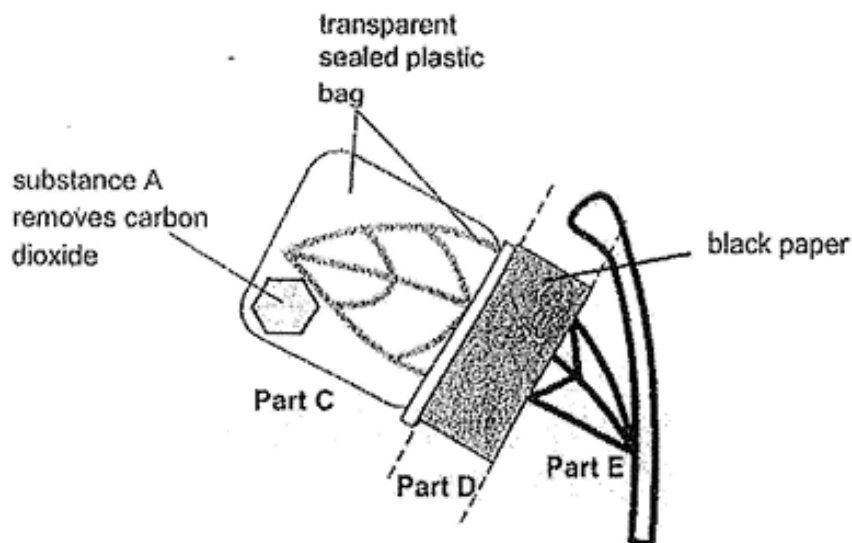
Which one of the following correctly represents distances x , y and z ?

Distance between the jar and the lamp (cm)			
	x	y	z
(1)	5	19	10
(2)	10	5	19
(3)	19	10	5
(4)	10	19	5

13. Andrew took a leaf and placed it in the dark for two days.

After two days, he did the following to the leaf:

- sealed Part C of the leaf with a plastic bag and added substance A into the plastic bag
- covered Part D with a piece of black paper
- left Part E untouched



Andrew then placed the leaf under sunlight for a few hours and tested for starch with iodine solution. Iodine turns dark blue when starch is present.

Which one of the following shows the correct observations?

	Part C	Part D	Part E
(1)	iodine turned dark blue	iodine turned dark blue	iodine remained yellowish brown
(2)	iodine remained yellowish brown	iodine turned dark blue	iodine remained yellowish brown
(3)	iodine turned dark blue	iodine remained yellowish brown	iodine turned dark blue
(4)	iodine remained yellowish brown	iodine remained yellowish brown	iodine turned dark blue

14. David observed the properties of four materials, P, Q, R and S. He recorded his observations in the table below. A tick (✓) shows that the material has the property.

Material	Flexible	Strong	Waterproof
P		✓	✓
Q	✓	✓	✓
R	✓		
S		✓	

The diagram below shows a tent made of parts A and B.

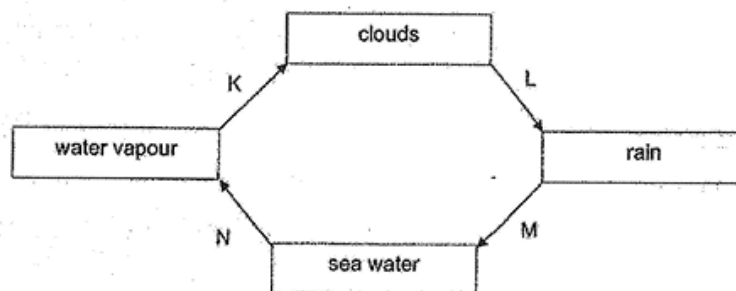


B is used to protect campers from the rain and can be stretched to form the shape of the tent. A is the centre pole that helps to support the weight of B.

Based on the information above, which of the materials, P, Q, R or S, are most suitable for making parts A and B of the tent?

	A	B
(1)	P	Q
(2)	Q	R
(3)	S	P
(4)	R	S

15. Study the diagram of the water cycle shown below.



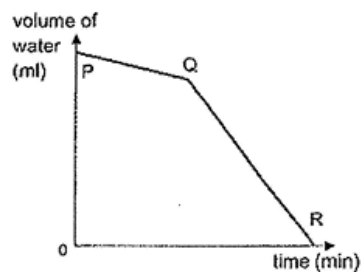
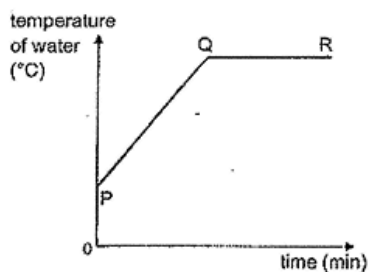
Which one of the following describes processes K, L, M or N correctly?

	Process	Description
(1)	K	heat gained
(2)	L	heat gained
(3)	M	heat loss
(4)	N	heat gained

16. 50ml of water in a small dish is heated over some time.



The graphs below show the temperature and the volume of water from the start of the experiment.



Based on the graphs, which of the following statements are true?

- A The water starts to boil at P.
- B The water starts to boil at Q.
- C The volume of water decreases at PR due to boiling only.
- D The volume of water decreases at PQ due to evaporation.

- (1) A and C only
- (2) A and D only
- (3) B and C only
- (4) B and D only

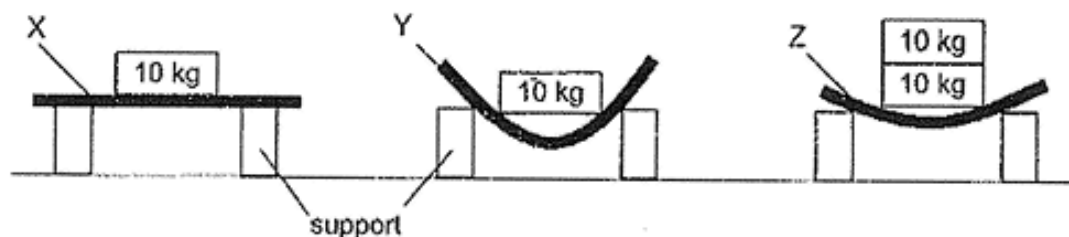
17. Four students listed ways to conserve water.

Student	Ways to conserve water
T	Wash the car using a water hose.
U	Turn off the tap when brushing our teeth.
W	Fix tap that is leaking as soon as possible.
V	Wash forks and spoons under running water.

Which students suggested ways that help in reducing the usage of water?

- (1) T and W only
- (2) T and V only
- (3) U and W only
- (4) U and V only

18. Liling had three planks made of different materials X, Y and Z. They were of the same length and size. She placed some bricks of 10 kg each on the planks. The diagram below shows her result.



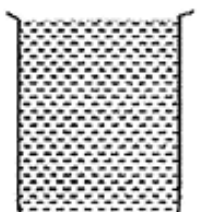
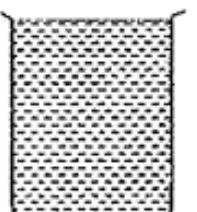
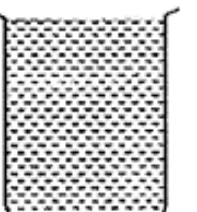
Liling wrote the following statements about the planks.

- A Plank Y is more flexible than plank X.
- B Plank Z is not as flexible as plank Y.
- C Planks X and Z have the same strength.

Based on the results, which of the following statement(s) is/are correct?

- (1) A only
- (2) A and B only
- (3) B and C only
- (4) A, B and C

19. Kasim wanted to find out how different conditions in the environment would affect the rate of evaporation of water. He placed three similar beakers containing 500 ml of water in different environment as shown in the diagram below.

Beaker A	Beaker B	Beaker C
		
Air-conditioned room Temperature: 22°C Wind: Not present	Open field Temperature 32°C Wind: Present	Open field Temperature: 32°C Wind: Not present

Which of the following shows the correct order of beakers?

	Highest amount of water left in the beaker	→	Lowest amount of water left in the beaker
(1)	A	B	C
(2)	A	C	B
(3)	B	C	A
(4)	C	A	B

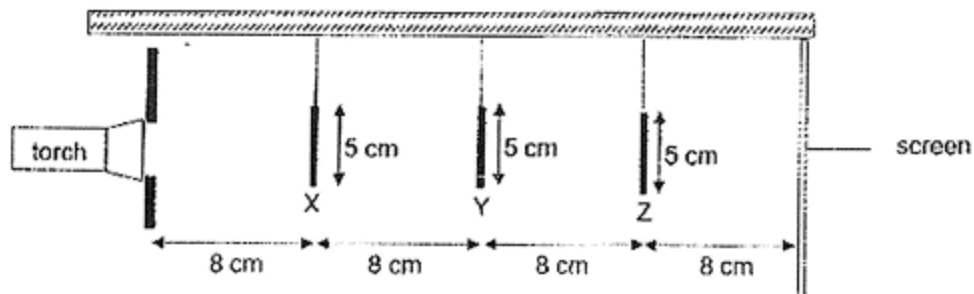
20. The table below shows the freezing and boiling points of three substances, E, F and G.

Substance	Freezing point (°C)	Boiling point (°C)
E	19	102
F	-5	18
G	71	134

Which one of the following statements is correct about the substances if they are placed in a room at 26°C?

- (1) Substance E will be in the solid state.
- (2) Substance G will be in the solid state.
- (3) Substances E and F will be in the liquid state.
- (4) Substances E and G will be in the gaseous state.













21. The set up below shows light shining on three wooden objects, X, Y and Z, hanging from a ceiling. They are placed at different distances from the torch.



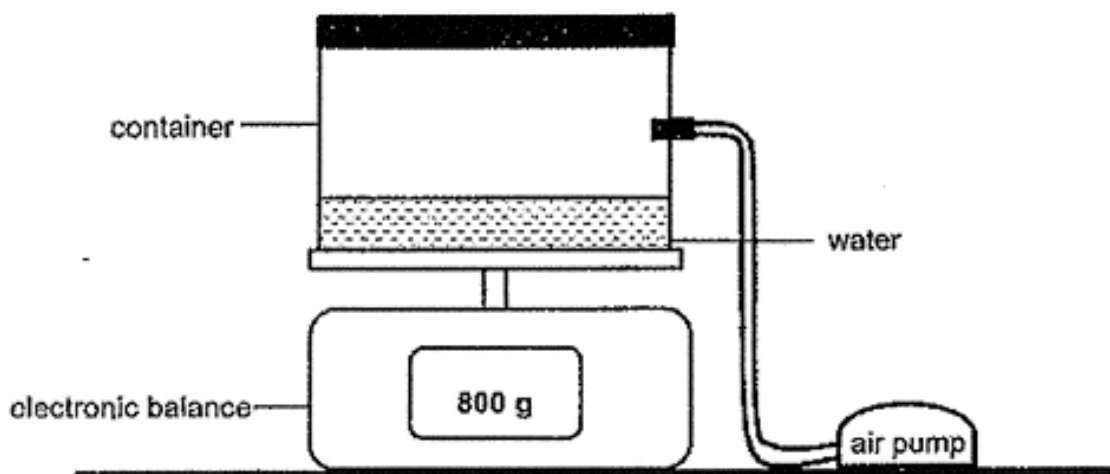
The diagram below shows the shadow of the objects formed on the screen.



What are objects X, Y and Z?

	X	Y	Z
(1)			
(2)			
(3)			
(4)			

22. The diagram below shows a pump connected to a container which is placed on an electronic balance. The capacity of the container is 3000 cm^3 . It also contains 500 cm^3 of water.

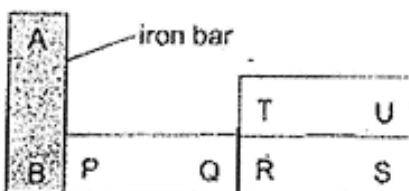


An additional 1000 cm^3 of air was pumped into the container.

Which of the following states the volume of air in the container and the reading on the electronic balance?

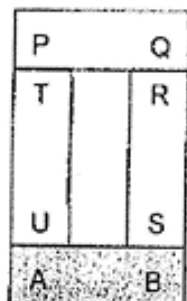
	Volume of air in the container (cm^3)	Reading on the electronic balance (g)
(1)	4000	800
(2)	2500	More than 800
(3)	1000	800
(4)	4500	More than 800

23. Susan set up three magnets PQ, RS, TU and an iron bar AB as shown in the arrangement below.

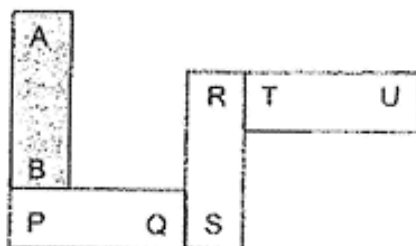


She then re-arranged the three magnets and the iron bar. Which one of the following is another possible arrangement?

(1)



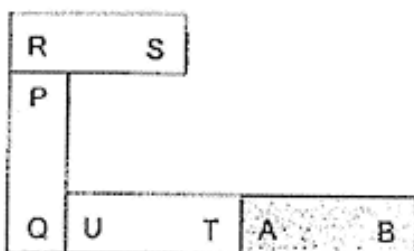
(2)



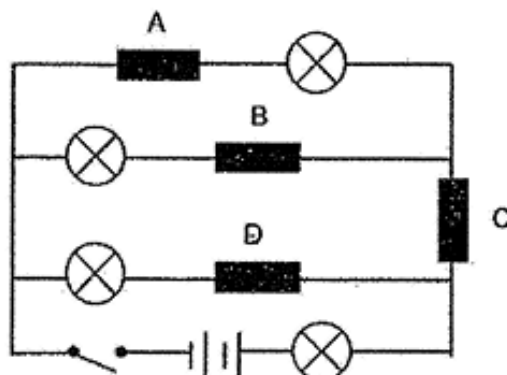
(3)



(4)

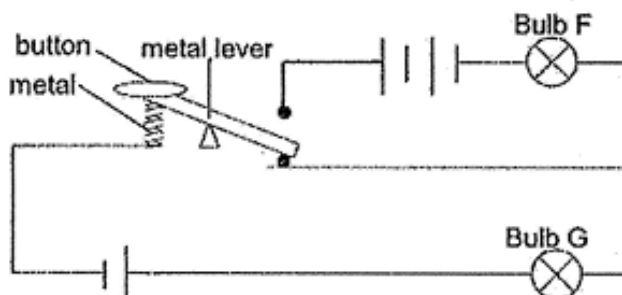


24. A circuit diagram is shown below. There are four blocks, A, B, C and D. Only one of the four blocks is an insulator of electricity. When the switch is closed, only two bulbs light up.



Which one of the blocks is the insulator of electricity?

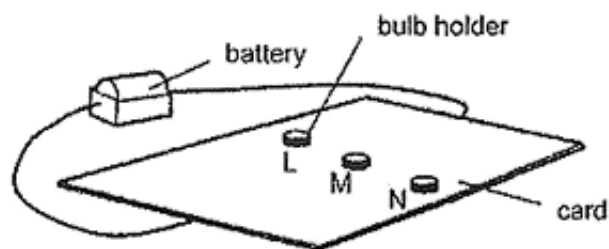
- (1) A
 - (2) B
 - (3) C
 - (4) D
25. Kenneth sets up an electric circuit using identical bulbs and batteries. In his circuit below, bulb F is unlit while bulb G is lit with a brightness of 2 units.



When the button is pressed and held down, what would happen to bulbs F and G?

	Bulb F	Bulb G
(1)	dimmer than 2 units	unlit
(2)	brighter than 2 units	unlit
(3)	dimmer than 2 units	brighter than 2 units
(4)	brighter than 2 units	brighter than 2 units

26. Jia Jun created a game using an electric circuit. The wires were hidden under the card so that only the bulb holders L, M and N could be seen.

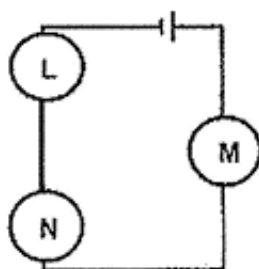


Jia Jun wanted to find out how bulb holders L, M and N were connected using two light bulbs. He recorded his results in the table below.

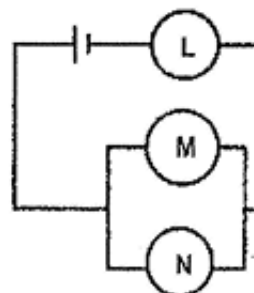
Bulbs placed at	Observation
M and N	bulbs did not light up
L and N	bulbs lit up
L and M	bulbs lit up

Which one of the following shows the correct circuit used in the game?

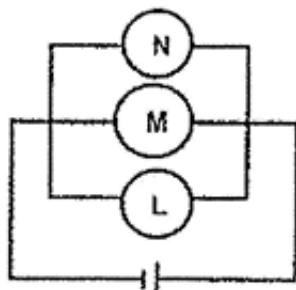
(1)



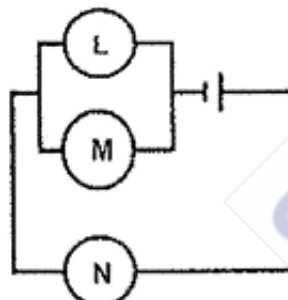
(2)



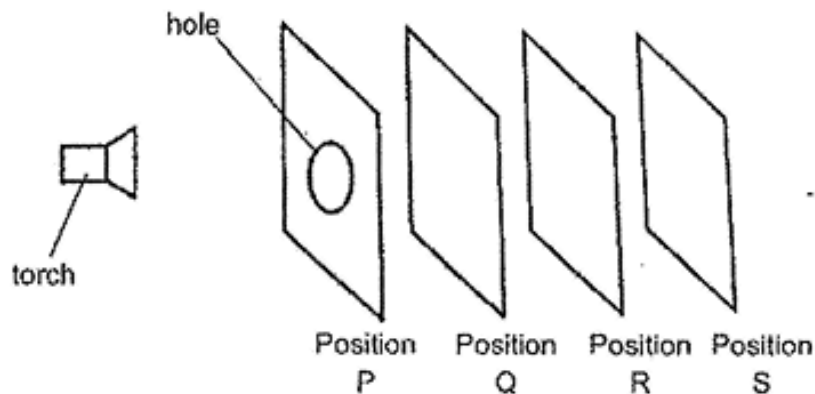
(3)



(4)



27. Mel set up the following experiment in a dark room. Four sheets of materials, A, B, C and D are arranged in one row at different positions as shown in the diagram below. A circular hole is cut in the middle of the sheet at position P.



The table below shows the properties of Materials A, B, C and D.

Property of Materials	Materials
Allows light to pass through	A and B
Does not allow light to pass through	C and D

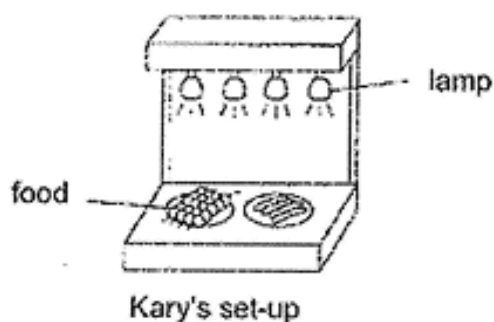
The sheet at Position R is-as shown below.



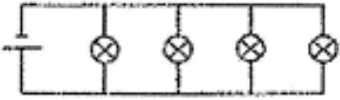

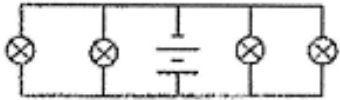
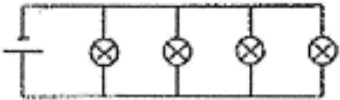
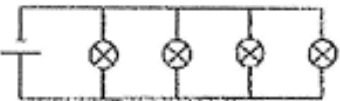
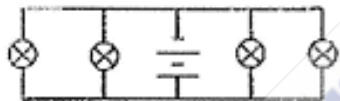
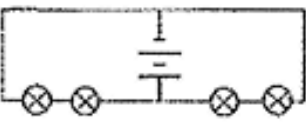

How did Mel arrange the sheets of Materials A, B, C and D to obtain the image at Position R?

	Position P	Position Q	Position R	Position S
(1)	A	B	C	D
(2)	B	C	A	D
(3)	C	A	D	B
(4)	D	C	B	A

28. Kary and Eva constructed the set-ups below that used four identical lamps to heat food. When the lamps were brighter, they gave out more heat. Kary found out that Eva's set-up was hotter than her set-up.



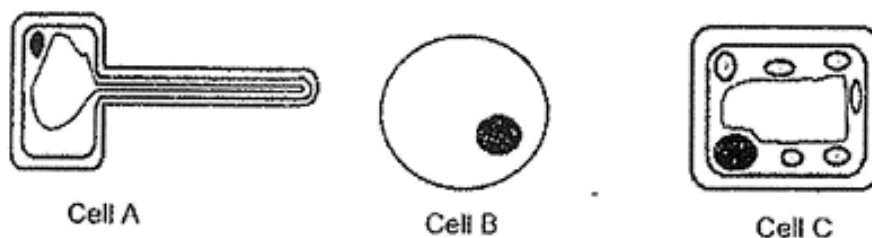
Which one of the following correctly shows the two set-ups?

	Kary's set- up	Eva's set up
(1)		
(2)		
(3)		
(4)		

Section B: 44 marks

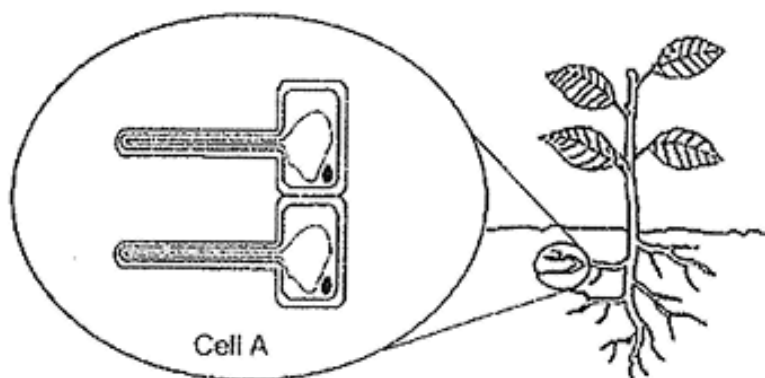
Read the questions carefully and write down your answers in the spaces provided.

29. The diagram below shows three cells, A, B and C.



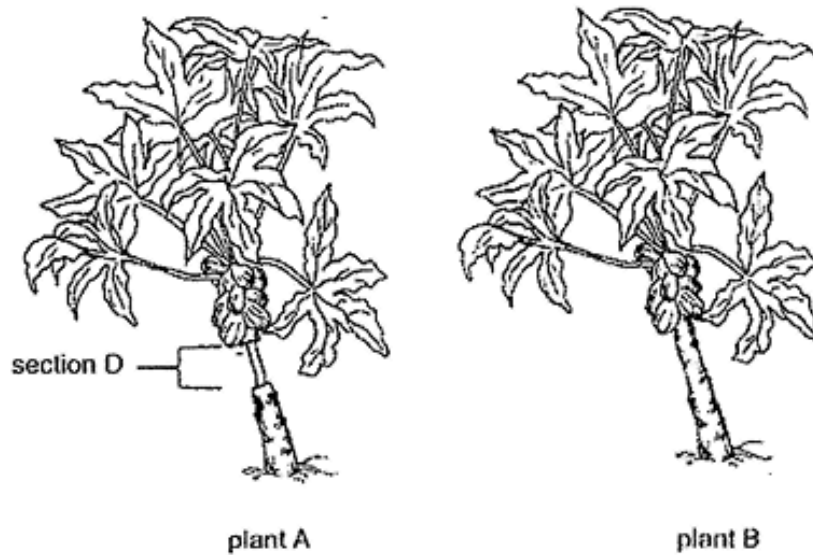
- (a) Identify one part of the cell that can be found in all the three cells and state its function.
[1]

The diagram below shows the close-up view of Cell A. Cell A has a long structure and it is found in the roots.



- (b) Based on the diagram above, explain how a longer structure on Cell A helps the plant to grow healthier.
[2]

30. Alex conducted an experiment using two similar plants, A and B in his garden. He removed only the food-carrying tubes from plant A at section D as shown below.



After some time, the two plants produced fruits as shown below.



- (a) Explain why plant A produced bigger fruits.

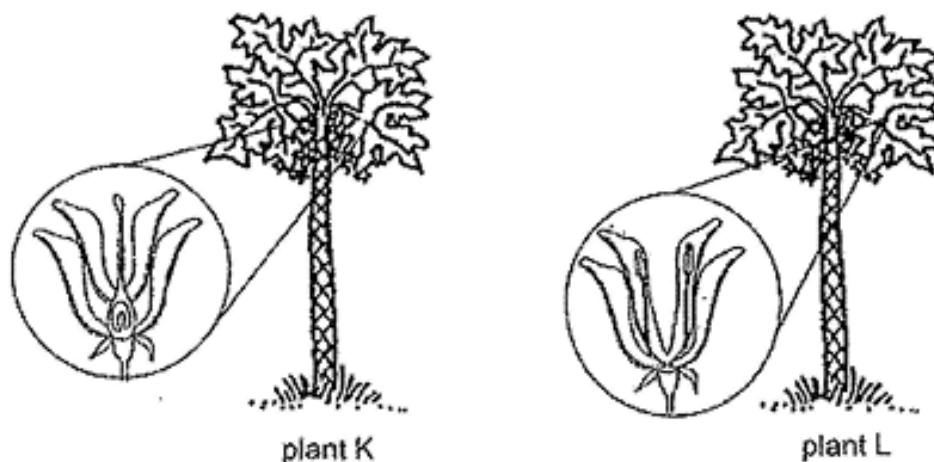
[2]

Question 30 continues on the next page.



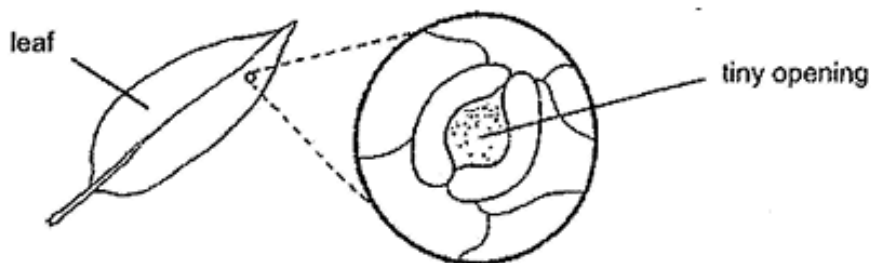
Question 30 continues.

In Alex's garden, there are two other similar plants, K and L. He observed that both plants produce flowers but only one bears fruits. He found that all the flowers on plant K looked different from the flowers on plant L.



(b) Which plant, K or L, does not bear fruits? Explain your answer. [2]

31. Zac studied the leaf under the microscope as shown in the diagram below.



- (a) What is the function of these tiny openings on the surfaces of leaves? Include in your answer the gases involved. [1]

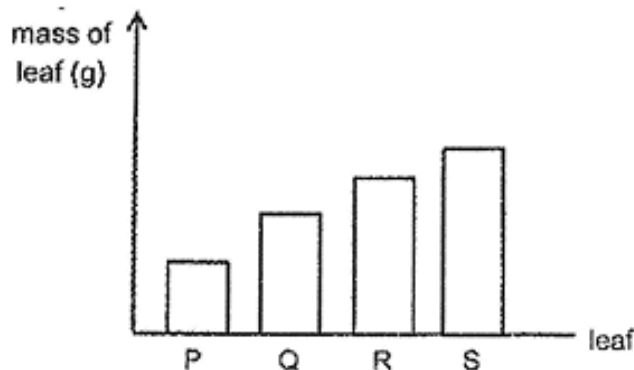
Zac set-up an experiment using four similar leaves, P, Q, R and S found on a plant that grows on land. These leaves have tiny openings on both their upper and lower surfaces. He coated some surfaces of the leaves with oil as shown in the table below.



Leaf	Coated with oil	
	Upper surface	Lower surface
P	no	no
Q	yes	no
R	no	yes
S	yes	yes

Question 31 continues.

The plant was placed under bright sunlight. He weighed the four leaves after some time. His results are shown in the graph below.

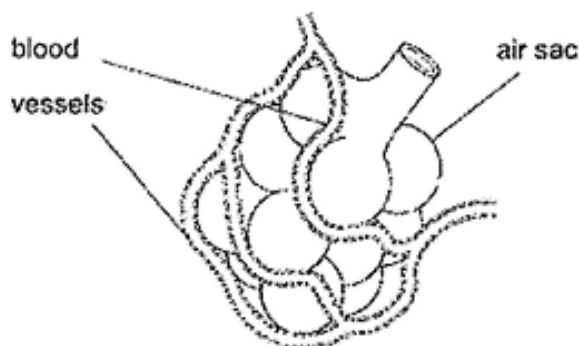


- (b) Arrange the leaves, P, Q, R and S, in order of mass, starting from the leaf that lost the least amount of water through the tiny openings. [1]

- (c) Based on Zac's experiment, are there more tiny openings on the upper or lower surface of the leaf? Explain why. [1]

- (d) Besides using the four leaves from the same plant, what is another characteristic of the leaves that should be kept the same for Zac's experiment to be fair? [1]

32. There are many air sacs found in our lungs for gaseous exchange to take place. The diagram below shows how each air sac is surrounded by many blood vessels.



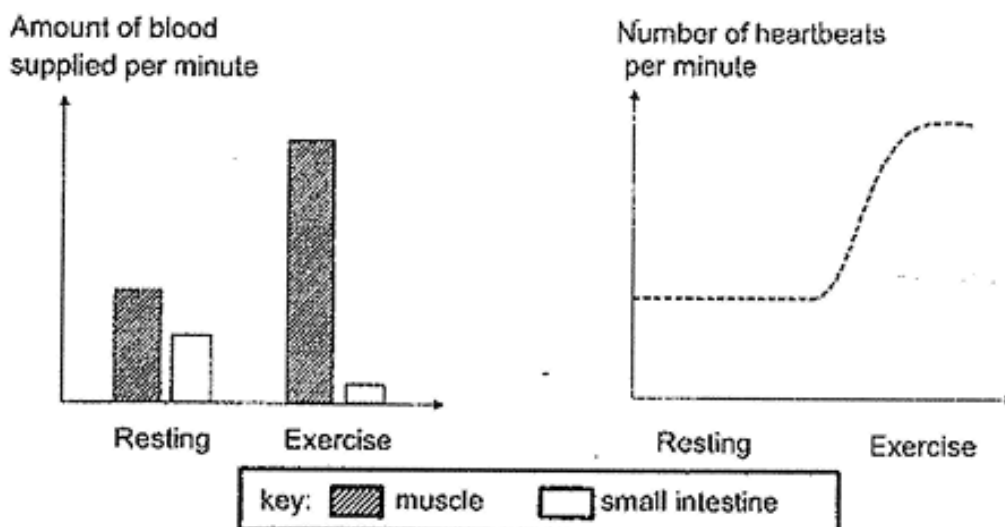
The table below shows the number of breaths taken by two non-smokers and two smokers at rest, as well as the number of air sacs found in a sample of their lungs.

	Number of air sacs	Number of breaths taken in per minute
Non-smoker 1	25	10
Non-smoker 2	18	15
Smoker 1	10	20
Smoker 2	7	25

- (a) Based on the table above, state the relationship between the number of air sacs found in the sample and the number of breaths taken in per minute. [1]

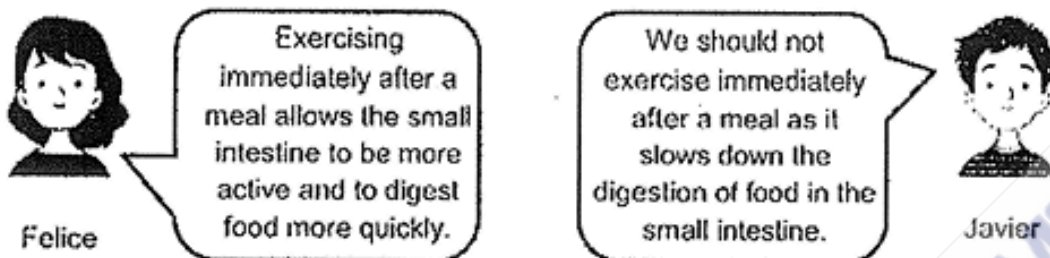
- (b) Explain why the breathing rate of both smokers is higher compared to the breathing rate of the non-smokers. [2]

33. The graphs below show the amount of blood transported to the muscles and small intestine and the heart rate of a person during resting and exercise.



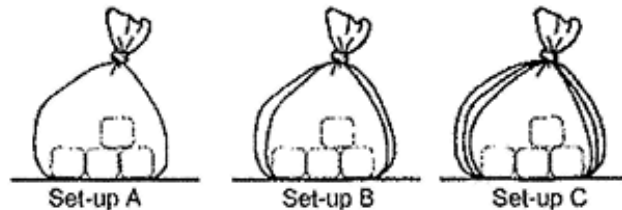
- (a) Based on the graph, explain how the changes in the heart rate during exercise affects the amount of blood transported to the muscles. [2]

The diagram below shows a conversation between two students.



- (b) Whose statement, Felice or Javier, is correct? Explain why. [1]

34. Mark wanted to find out how the number of plastic bags used to wrap ice cubes would affect the time taken for ice cubes to change completely into water. He prepared three set-ups, A, B and C, as shown below, with ice cubes of the same size.



The time taken for all the ice cubes to change into water completely is shown in the table below.

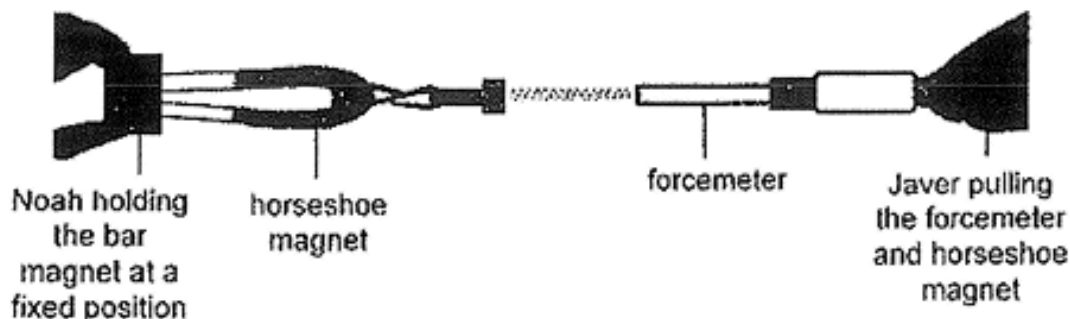
Set-up	Time taken for the ice cubes to change into water completely (minutes)
A	30
B	62
C	54

- (a) Name the process that caused the ice cubes to change into water. [1]

- (b) Explain how using ice cubes of the same size ensures a fair test. [1]

- (c) Do you agree with the results shown in the table above? Explain your answer. [2]

35. Noah and Javier wanted to find out the amount of force needed to pull different bar magnets apart from a horseshoe magnet. They set up an experiment as shown below. A forcemeter is used to measure the amount of force needed to pull the magnets apart.



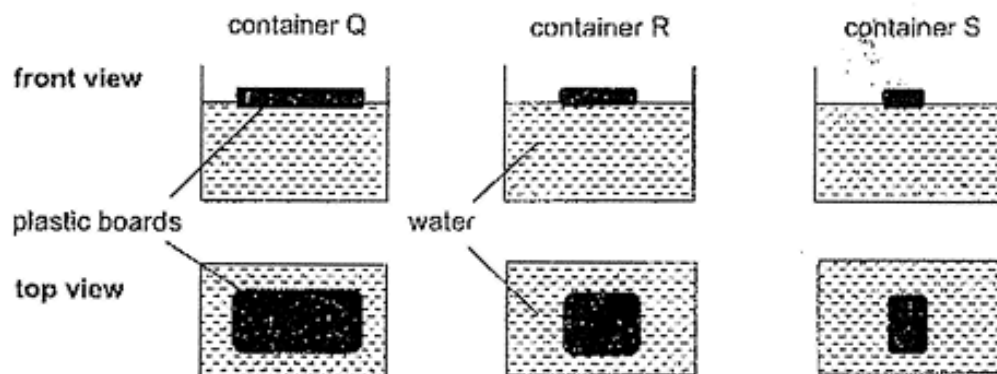
Noah and Javier tested four bar magnets, P, Q, R and S, and recorded their data in the table below.

Bar magnet	P	Q	R	S
Amount of force needed to pull the magnets apart (units)	4	3	9	7

- (a) Based on their results, state and explain which bar magnet, P, Q, R or S has the weakest magnetic strength. [1]

- (b) Using only a steel paper clip and a ruler, describe another way the strength of the bar magnets can be measured. [2]

36. Craig placed three plastic boards of different sizes in identical containers, Q, R and S, filled with 500ml of water as shown below. The containers were then placed under the sun for three hours.



At the end of three hours, Craig recorded the volume of water left in the table below.

Container	Surface area of plastic board (cm ²)	Volume of water left (ml)
Q	80	385
R	40	?
S	20	315

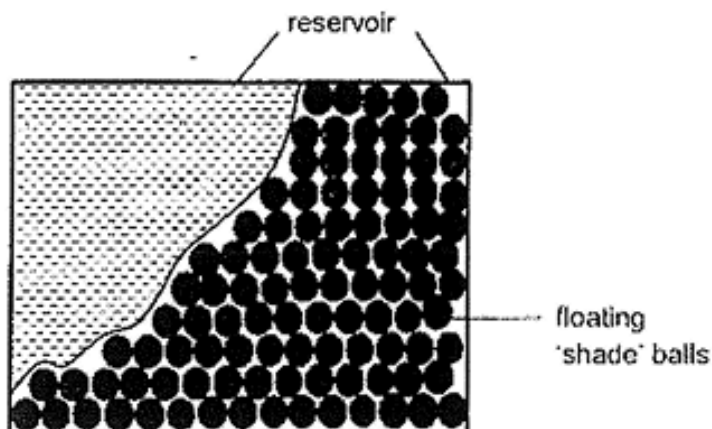
- (a) Based on the results above, predict the amount of water left in container R. [1]

- (b) Suggest how Craig can improve on the reliability of his results. [1]

Question 36 continues.

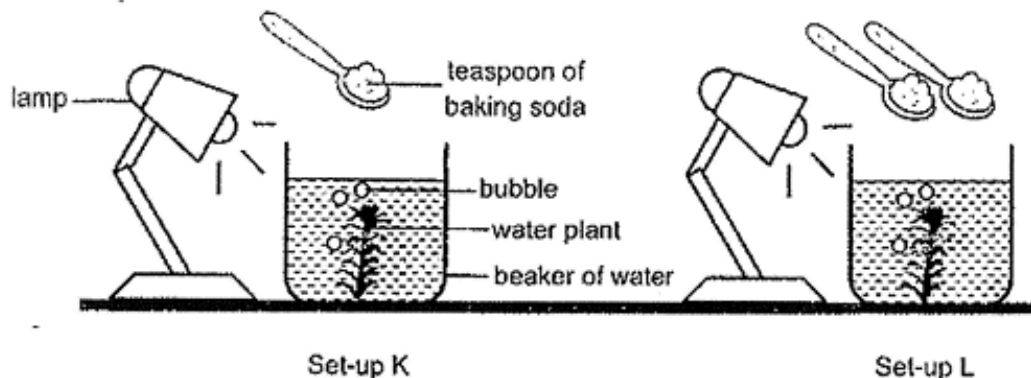
In some countries that experience prolonged periods of hot weather, the reservoirs dry up quickly, resulting in water shortage.

To solve this problem, many floating plastic 'shade' balls are released into the reservoirs as shown in the diagram below.



(c) Explain how the plastic balls help to solve the problem on water shortage. [2]

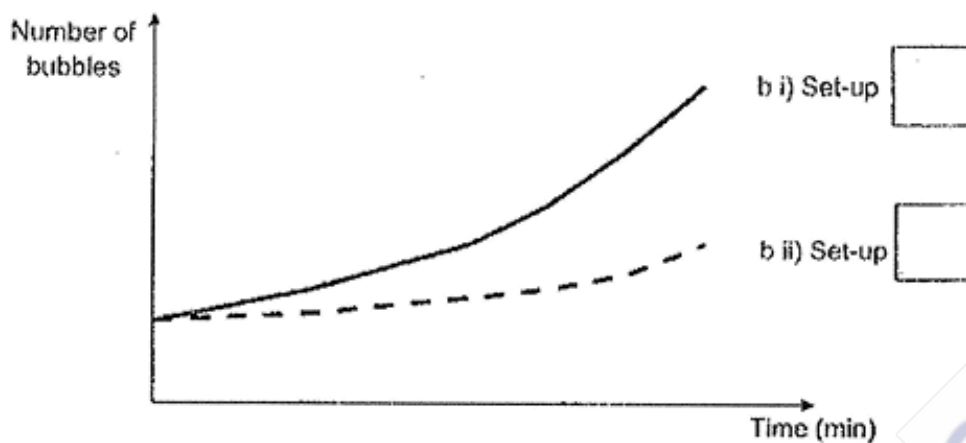
37. An experiment was carried out to study the effect of the amount of carbon dioxide in water and the number of bubbles formed. Two similar set-ups, K and L, were prepared as shown in the diagram below.



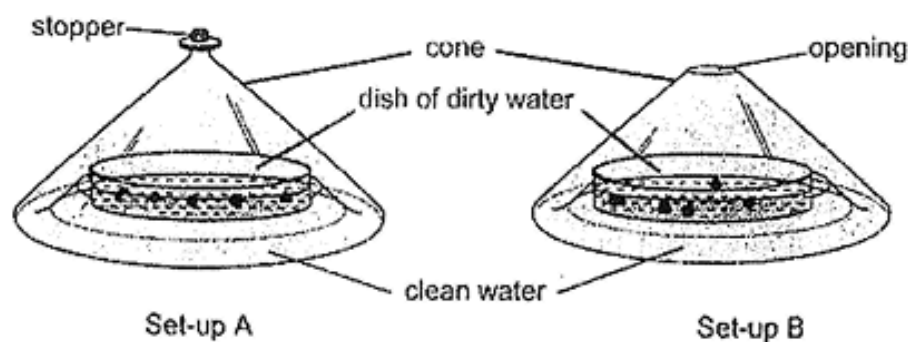
Baking soda was added to increase the amount of carbon dioxide in the water. Bubbles were observed appearing on the plant. The results were recorded in the graph below.

- (a) State what the bubbles are and explain how they are formed. [1]

- (b) On the graph, indicate in each box which line in the graph represents Set-up K and Set-up L. [1]



38. On a sunny day, Li Wei conducted an experiment using the set-ups as shown below. After several hours, he observed that clean water was collected at the base of each cone.

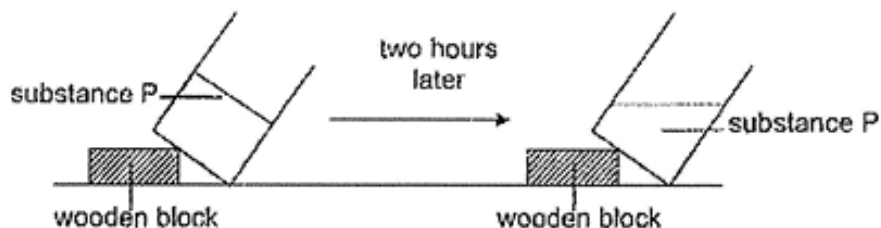


- (a) Explain how clean water is collected at the base of the cone in Set-up A. [2]

- (b) What would you observe about the amount of water collected in Set-up A and Set-up B? Explain your answer. [2]

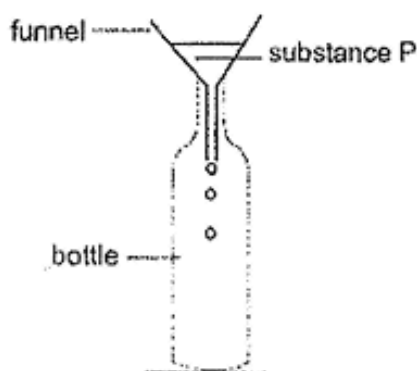
- (c) Without making changes to the dish of dirty water, suggest how Li Wei can collect more clean water in Set-up A. [1]

39. A beaker which contains substance P is left on the table for two hours. After two hours, the shape of substance P in the beaker changes as shown below.



- (a) Which state of matter is substance P at the start of the experiment? Explain why using properties of matter. [1]

A funnel was used to fill a bottle with substance P as shown below.

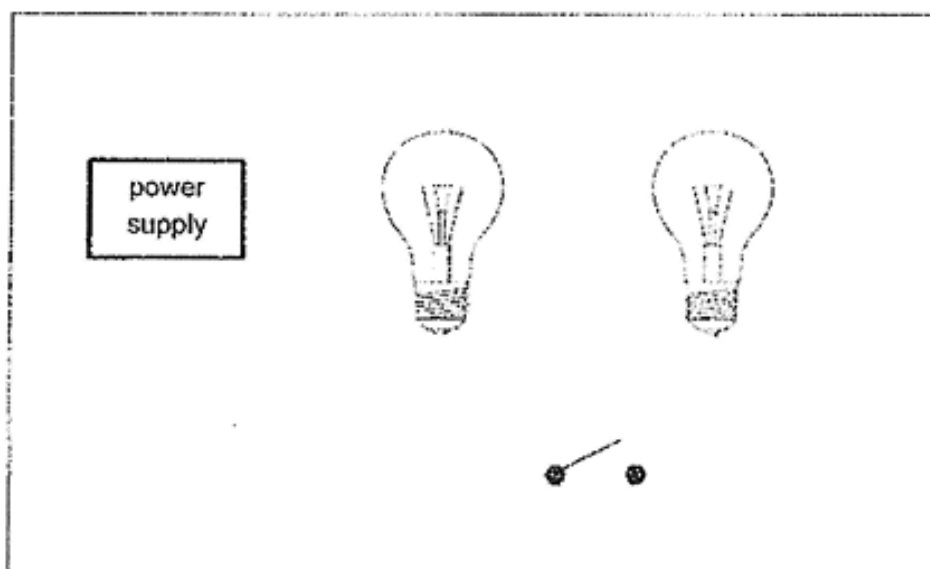


Mary observed that substance P trickled slowly into the bottle at the start. After the funnel was lifted slightly above the mouth of the bottle, substance P entered the bottle at a faster rate.

- (b) Explain Mary's observation. [2]

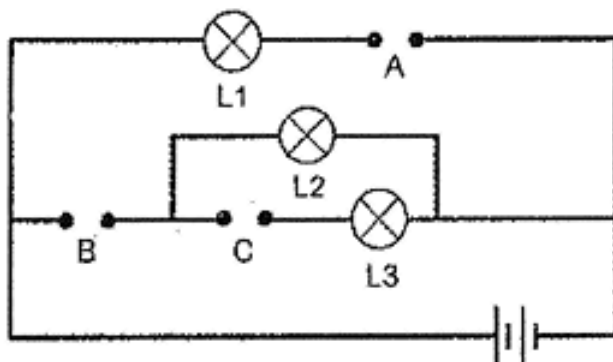
40. Wallace wants to set up an electric circuit.

- (a) Complete the circuit diagram below with wires which will enable Wallace to connect the bulbs in maximum brightness and turn on one of the bulbs without affecting the other bulb. [2]



- (b) What is an advantage of the circuit arrangement that you have drawn? [1]

41. Kai Ming had an aluminium rod, a steel rod and a wooden rod. He connected the three rods at the positions A, B and C as shown in the circuit diagram below.



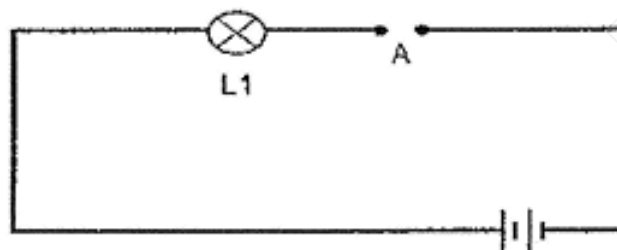
- (a) He observed that only bulbs L1 and L2 were lit. Complete the table below to indicate the position, A, B or C, where the rods are placed in the circuit. [1]

Position			
Material	aluminium	wood	steel

In another experiment, Kai Ming was given a battery, a bulb and a magnet. He chose one of the three objects to place at position C while leaving positions A and B open. Bulbs L2 and L3 were lit.

- (b) Based on his observation, which one of the objects, battery, bulb or magnet, did he place at position C? Explain your answer. [1]

Kai Ming removed some electrical components from the circuit and formed a new circuit as shown below.



Question 41 continues.

- (c) Kai Ming placed two more batteries at A. He observed that bulb L1 lit up brightly only for a short while and then did not light up. Explain why. [1]

ANSWER SHEET

SECTION A

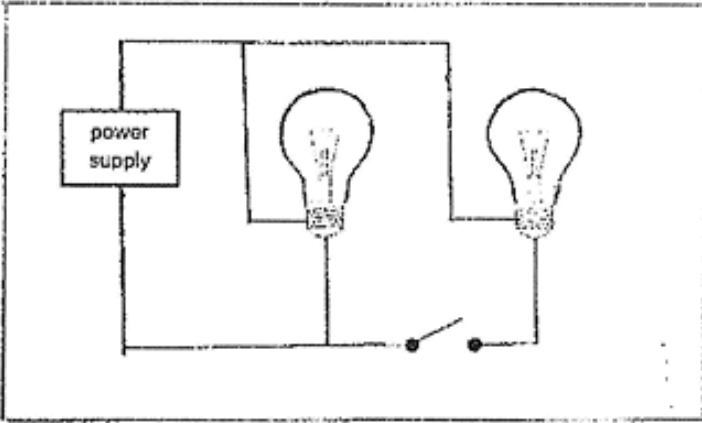
Q 1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
3	1	1	4	2	2	4	2	4	1
Q 11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
3	4	4	1	4	4	3	2	2	2
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28		
3	2	1	3	4	2	3	3		

No.	Suggested Answers (full marks or partial marks)	Things to note.
29a	<p>Cell membrane - Controls <u>movement</u> of substances in and out of the cell.</p> <p>Nucleus - Contains <u>genetic</u> information OR controls all activities in the cell.</p> <p>Cytoplasm - Place where cell <u>activities</u> take place OR Allows substances to move around within the cell.</p>	
29b	<p>Point 1: The longer structure on cell A increases the exposed <u>surface</u> area of the root in contact with the soil.</p> <p>Point2: Therefore, the root can <u>absorb</u> more water and mineral salts.</p>	<p>Nutrients are not the same as mineral salts.</p> <p>Nutrients include all substances that provide nourishment e.g., carbohydrates, proteins, fats, minerals etc.</p> <p>Roots absorb mineral salts from the soil,</p>
30a	<p>Point 1: Food made by the leaves could not be <u>transferred</u> to the parts of the plant below Section D.</p> <p>Point 2: Hence, the food <u>was stored</u> in the fruits above section D.</p>	<p>Use the labelling provided in the diagram (e.g., below/above section D) to explain your answers clearly.</p> <p>Not all the food is transported to the fruits.</p>

30b	<p>Choice: Plant L</p> <p>Data: The <u>female</u> reproductive parts of the flower are absent.</p> <p>Explain: Hence, no <u>pollination</u> and <u>fertilisation</u> could take place.</p>	Name the process instead of defining them if not required by the question.
31a	<p>The tiny opening allows the plant to take in gases and give out gases like <u>oxygen</u> and <u>carbon dioxide</u>. Water vapour also escapes through the tiny openings.</p>	
31b	S, R, Q, P.	
31c	<p>Choice: There are more <u>stomata</u> on the lower surface of the leaf</p> <p>Data: The <u>mass</u> of leaf Q is lesser than the mass of leaf R.</p> <p>Explain: Q lost <u>more</u> water through the tiny openings on the lower surface than R.</p>	Structure your answers using CDE.
31d	<p>The mass of the leaf at the <u>start of experiment</u></p> <p>OR</p> <p>Surface area or size of the leaves.</p>	<p>Answer must be practical.</p> <p>e.g., Number of tiny openings on the upper and lower surface of the leaf is not accepted as it is not possible to count.</p>
32a	<p>As the number of air sacs <u>increases</u>, the number of breaths taken in per minute <u>decreases</u>.</p>	<p>Use the sentence structure, As the (cause) <u>increases/decreases</u>, the (effect) <u>increases/decreases/ remains the same</u>.</p>

32b	<p>Data: A smoker has a lesser number of air sacs.</p> <p>Explain: Hence, the breathing rate increases to increase the amount of <u>oxygen</u> taken in.</p>	
33a	<p>During exercise our body needs more energy. The heart rate increases during exercise to pump more <u>blood</u> faster to transport more <u>oxygen</u> and <u>digested food</u> to our muscles to release more energy for the exercise.</p> <p>At the same time more carbon dioxide and other waste materials can be transported away from the muscles quickly.</p>	
33b	Javier. There is lesser blood supplied to the small intestine during exercise.	
34a	Melting.	
34b	The difference in the results of the experiment is solely due to the number of plastic bags and not other variables like the size of ice cubes.	Do not confuse fair test with reliability (Q36a) of results.
34c	<p>Choice: No.</p> <p>Data: The time taken for the ice in set-up C to melt should be <u>longer</u> than that in set-up B.</p> <p>Explain: C has more plastic bags which is a <u>poor</u> conductor of heat. Therefore, heat transfer from the surroundings to the ice is <u>slower</u>.</p> <p>OR</p> <p>There is more air trapped in between the plastic bags. Air is a poor conductor of heat. Therefore, heat transfer from the surroundings to the ice is slower.</p>	Ensure heat transfer is described clearly.

35a	Magnet Q. The amount of force needed to pull the magnets apart is the <u>least</u> .	Use the measure variable given in the table to ensure your wording are clear.
35b	Place the paper clip on a table at a fixed position. Use the magnet to attract it at a distance. Measure the <u>distance</u> between the magnet and paper clip when it attracts.	State the measured variable clearly.
36a	Any value between 315 to 385 ml.	Remember to write your units.
36b	To obtain reliable results, he should <u>repeat</u> the experiment at least three times, check for <u>consistency</u> of his result and calculate the average.	
36c	The floating shade balls decrease the exposed surface area of <u>water</u> in the reservoir. Hence, less water will gain heat from the surrounding air slowing down the rate of evaporation of water	
37a	Oxygen. The water plant carries out photosynthesis.	
37b	b(i) L b(ii) K	
38a	Water in the dish gains heat from the surroundings and <u>evaporates</u> to form water vapour. The warmer water vapour from the dirty water comes into contact with the <u>cooler</u> upper surface of the cone, loses heat and <u>condenses</u> to form water droplets which then drips down and is collected at the base of the cone.	Ensure the source of water vapour is identified. Temperature difference between the water vapour and cooler surface must be stated clearly.

38b	<p>The amount of water in B would be less than A.</p> <p>Some water vapour in the cone in set-up B <u>escaped</u> into the surrounding through the opening at the top of the cone. This results in lesser water vapour condensing to form lesser water in B.</p>	<p>Explain why B collects less water vapour. Need to show comparison.</p>
38c	Add a cold ice pack on the cone.	
39a	<p><u>Solid</u> state. Substance P has a <u>definite</u> shape and does not take the shape of the container when tilted.</p>	
39b	<p>Air in the bottle occupies the <u>space</u>.</p> <p>Therefore, substance P trickled slowly into the bottle.</p> <p>Air will <u>escape</u> when the funnel is lifted, causing P in the funnel to enter the bottle to occupy the space previously occupied by air.</p>	
40a		<ol style="list-style-type: none"> Determine the type of circuit (parallel or series) to draw. Clue: bulbs in maximum brightness'. Therefore, the bulb needs to be connected parallel to each other. Ensure that the metal tip and the metal casing of the bulb are connected to the opposite terminals of the power supply.
40b	When one bulb <u>fuses</u> , the other bulbs can still be lit.	Incomplete answer:

		When one bulb fuses, the other bulbs will not fuse - doesn't show that the circuit the other bulb is connected to remains closed and that the other bulb will continue to light up																
41a	<table border="1"> <tr> <td>position</td> <td>A</td> <td>C</td> <td>B</td> </tr> <tr> <td>material</td> <td>aluminium</td> <td>wood</td> <td>steel</td> </tr> </table> <p>OR</p> <table border="1"> <tr> <td>position</td> <td>B</td> <td>C</td> <td>A</td> </tr> <tr> <td>material</td> <td>aluminium</td> <td>wood</td> <td>steel</td> </tr> </table>	position	A	C	B	material	aluminium	wood	steel	position	B	C	A	material	aluminium	wood	steel	
position	A	C	B															
material	aluminium	wood	steel															
position	B	C	A															
material	aluminium	wood	steel															
41b	Battery. At position C, the battery and the two bulbs, L2 and L3, formed a <u>closed</u> circuit, allowing electricity to follow through.																	
41c	Too much electricity flowed through the circuit, causing the light bulb to <u>fuse</u> .																	

CATHOLIC HIGH SCHOOL EOY PAPER

Booklet A (28 × 2 marks)

For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). Shade your answer on the Optical Answer Sheet. (56 marks)

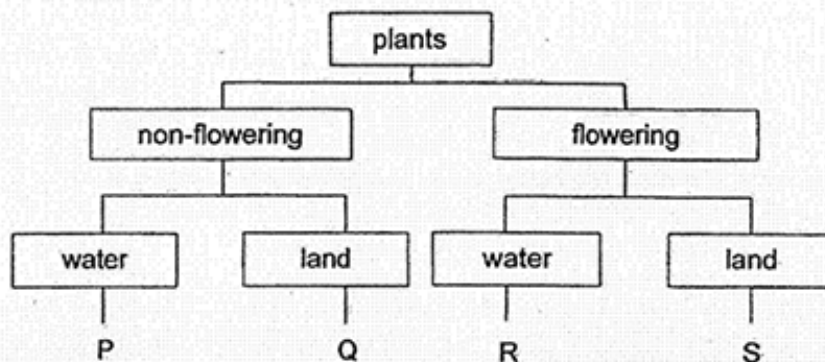
- 1 The table shows the characteristics of four things, A, B, C and D. A tick (✓) indicates the presence of the characteristic.

Thing	needs air, food and water	can make food	can move from place to place	has four legs
A	✓		✓	✓
B				✓
C	✓		✓	
D	✓	✓		

Which of the following correctly represents A, B, C and D?

	A	B	C	D
(1)	bee	hibiscus plant	chair	giraffe
(2)	giraffe	chair	hibiscus plant	bee
(3)	chair	bee	giraffe	hibiscus plant
(4)	giraffe	chair	bee	hibiscus plant

2 Study the diagram.

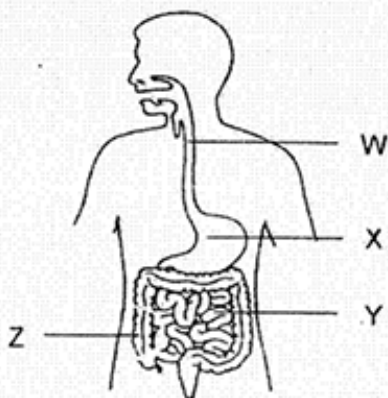


Plant G reproduces from spores and grows on the branches of a tall tree.

Based on the characteristics of plant G, which letter, P, Q, R or S, represents plant G?

- (1) P
- (2) Q
- (3) R
- (4) S

3 The diagram shows the human digestive system.



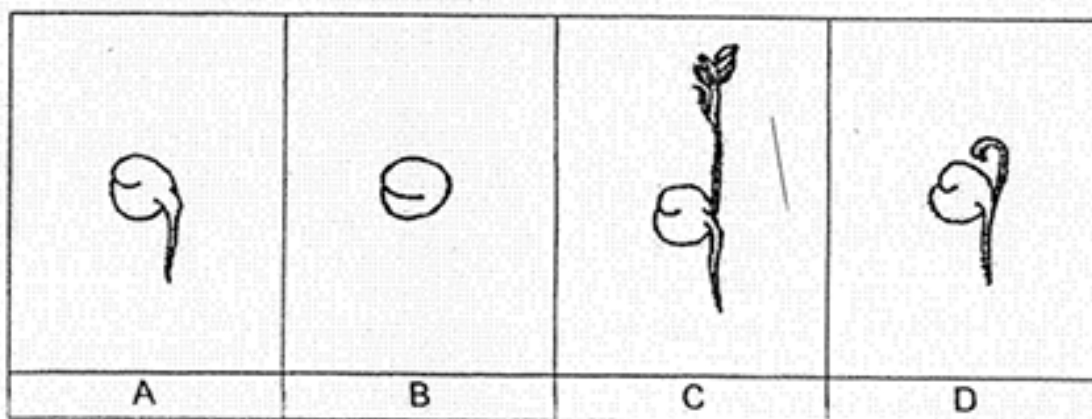
Which of the following correctly shows the functions of the organs?

	absorption of digested food	absorption of water
(1)	W	X
(2)	X	Y
(3)	Y	Z
(4)	Z	Y

4 Which plant part is **not** matched correctly to its functions?

	plant part	function
(1)	seed	to grow into a new plant
(2)	leaf	to make food for the plant
(3)	stem	to anchor the plant firmly to the ground
(4)	root	to absorb water and mineral salts from the soil

5 The diagrams show the stages of the development of a seed.



Which of the following shows the correct order of growth of a seed?

- (1) B → A → C → D
- (2) B → A → D → C
- (3) B → D → A → C
- (4) B → D → C → A

- 6 Squirrels store a large number of nuts during winter. The squirrels often eat the nuts halfway because the bottom part of the nut tastes bitter. As the winter turns to spring, these half-eaten nuts can still germinate and grow into young plants.

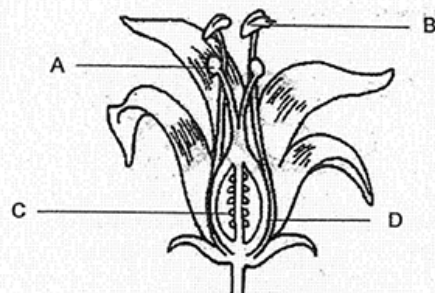


Which are possible reasons why the half-eaten nuts can still germinate and grow into young plants?

- A They receive light to germinate.
- B There is food stored for the young plant.
- C The baby plant is found at the bottom of each nut.
- D There is warmth for germination when winter turns to spring.

- (1) A and C only
- (2) B and D only
- (3) B, C and D only
- (4) A, B, C and D

- 7 Raja conducted an experiment using two insect-pollinated flowers, P and Q, from the same plant. The diagram shows the parts of one flower.



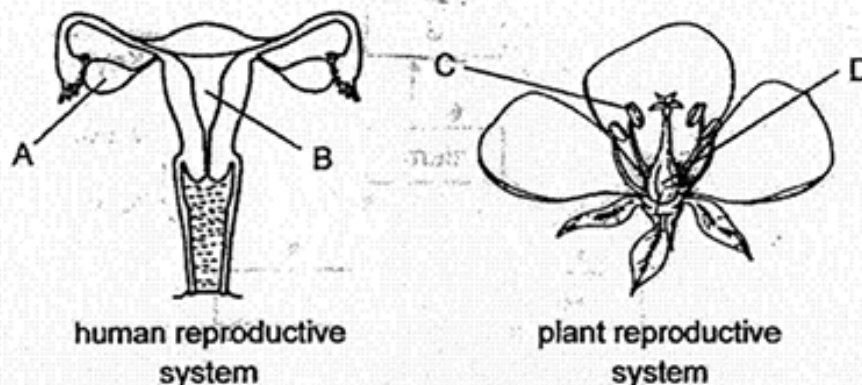
He removed a part from flower P and another part from flower Q. He recorded his observations of the development of the flower over time.

flower	develops into a fruit
P	yes
Q	no

Which of the following shows the parts removed from the flowers?

	flower P	flower Q
(1)	A	B
(2)	C	D
(3)	C	A
(4)	B	D

8 The diagrams show the human and the plant reproductive systems.



Which statement is correct about both reproductive systems?

	part	statement
(1)	A and C	Both parts produce female reproductive cells.
(2)	A and D	Both parts need to be present for fertilisation to occur.
(3)	B and C	Both parts produce male reproductive cells.
(4)	B and D	The male and female reproductive cells fuse in these parts.

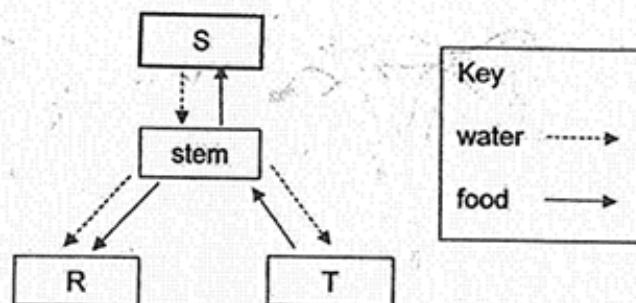
9 The table shows some characteristics of Jane's parents and herself.

	has dimples	able to roll tongue	long hair
Jane's father	No	Yes	No
Jane's mother	Yes	No	Yes
Jane	Yes	Yes	No

Based on the table, how many characteristics did Jane inherit from each of her parents?

- (1) one from father and one from mother
- (2) one from father and two from mother
- (3) two from father and one from mother
- (4) two from father and two from mother

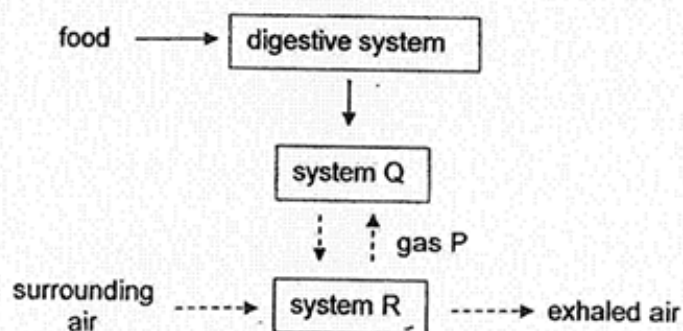
- 10 The diagram shows how water and food are transported in a plant.



Which of the following correctly shows the parts of the plant?

	R	S	T
(1)	roots	flowers	leaves
(2)	leaves	roots	flowes
(3)	flowers	leaves	roots
(4)	flowers	roots	leaves

- 11 The diagram shows how food and various gases are transported in the human body.



What are systems Q and R and gas P?

	system Q	system R	gas P
(1)	circulatory	respiratory	oxygen
(2)	respiratory	circulatory	oxygen
(3)	circulatory	respiratory	carbon dioxide
(4)	respiratory	circulatory	carbon dioxide

- 12 Diagrams 1 and 2 show how gases are transported in the circulatory system of a fish and a human respectively.

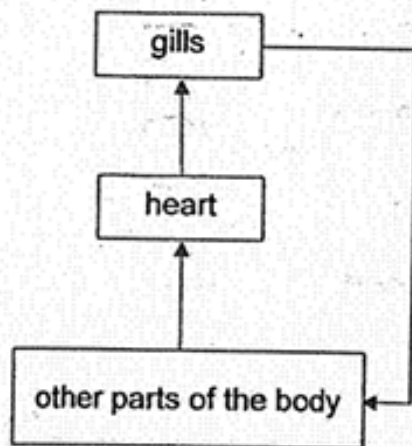


diagram 1

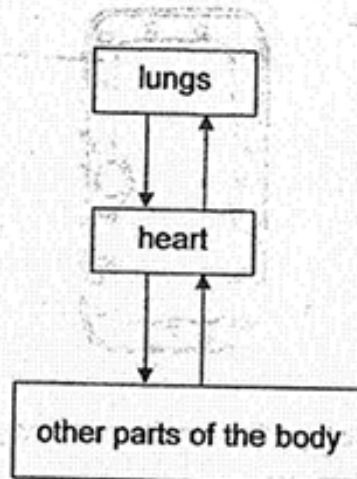


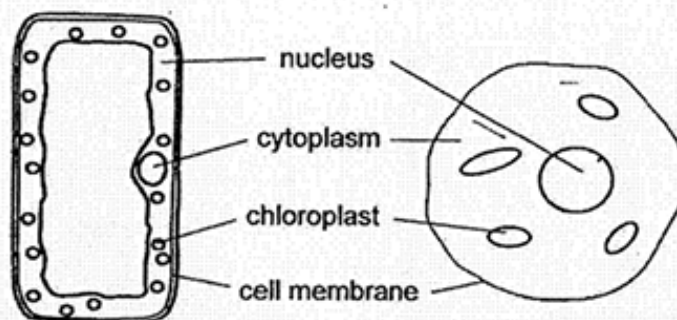
diagram 2

Based on the diagrams, which statement(s) is/are correct?

- A A fish has a single circulation but a human has a double circulation.
- B Exchange of gases takes place in the gills for the fish and lungs for the human.
- C The human circulatory system transports substances around the body but the fish circulatory system does not transport substances around the body.

- (1) A only
- (2) A and B only
- (3) B and C only
- (4) A, B and C

13 The diagram shows two cells.



Which part is labelled correctly?

- (1) nucleus
- (2) cytoplasm
- (3) chloroplast
- (4) cell membrane

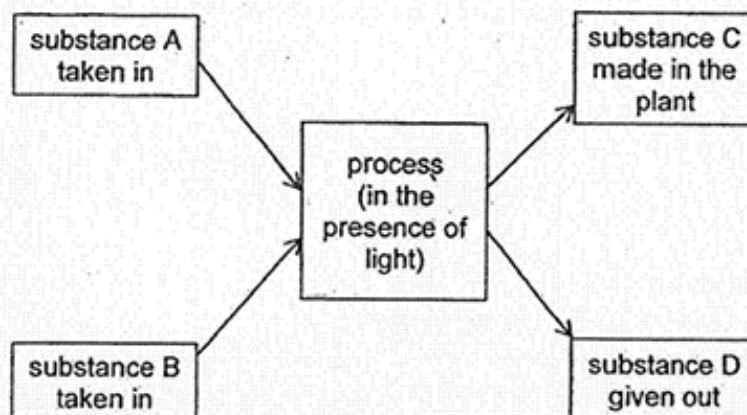
14 The table shows the characteristics of two cells, G and H.
A tick (✓) indicates the presence of the characteristic.

parts of the cell	cell G	cell H
cell wall	✓	
nucleus	✓	✓
chloroplast		
cell membrane	✓	✓

Which of the following correctly represents cells G and H?

	cell G	cell H
(1)	cheek cell	root cell
(2)	root cell	cheek cell
(3)	root cell	leaf cell
(4)	leaf cell	cheek cell

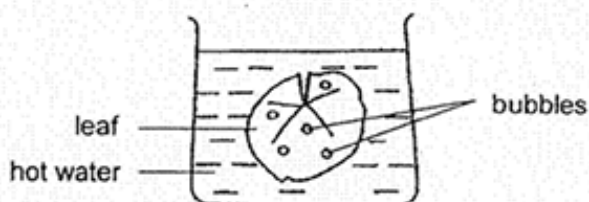
- 15 The diagram shows a certain process that takes place in green plants.



Which of the following correctly identifies substances A, B, C and D?

	substance A	substance B	substance C	substance D
(1)	food	water	oxygen	carbon dioxide
(2)	oxygen	food	carbon dioxide	water
(3)	carbon dioxide	water	food	oxygen
(4)	carbon dioxide	food	oxygen	water

- 16 Wei Yang plucked a leaf from a plant and placed it in a beaker of hot water.



He observed that the bubbles formed only on the upper surface of the leaf.

Which statement is correct?

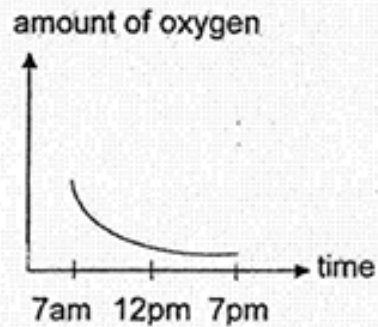
- (1) Bubbles formed in the water and landed on the upper surface of the leaf.
- (2) Air escaped through tiny openings found on both surfaces of the leaf.
- (3) The leaf had tiny openings on the upper surface but not on the lower surface.
- (4) Air entered the lower surface of the leaf and escaped through the upper surface.

- 17 Pete painted the glass jar black and watered the plant before placing the set-up in the sun. He measured the amount of oxygen in the glass jar from 7 am to 7 pm.

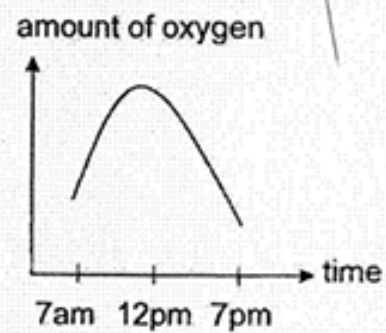


Which graph shows how the amount of oxygen in the glass jar changed from 7 am to 7 pm?

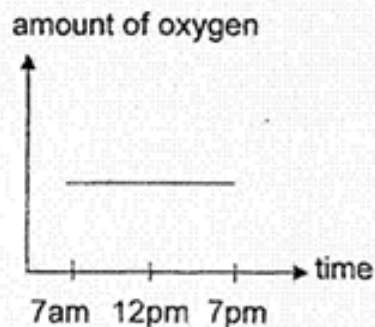
(1)



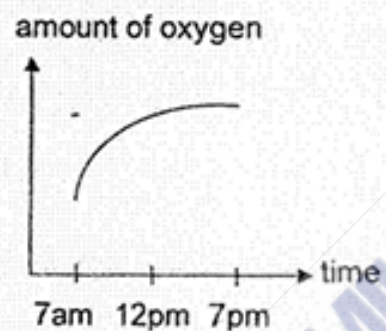
(2)



(3)



(4)

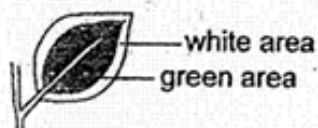


- 18 Devi wanted to find out if adding fertiliser to four similar plants, P, Q, R and S, would affect the rate of photosynthesis. The table shows the conditions for the four plants.

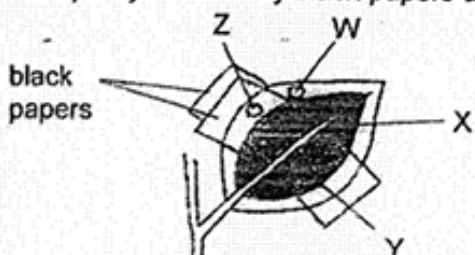
	plant			
	P	Q	R	S
amount of water (ml)	60	60	60	0
amount of light (units)	4000	0	4000	2000
amount of fertiliser (g)	0	12	6	12

Which two plants should she use for her experiment?

- (1) P and R
 - (2) P and S
 - (3) Q and R
 - (4) Q and S
- 19 The diagram shows a leaf on a plant. At the start of the experiment, there was no food on the leaf.



Next, the leaf was partly covered by black papers as shown.

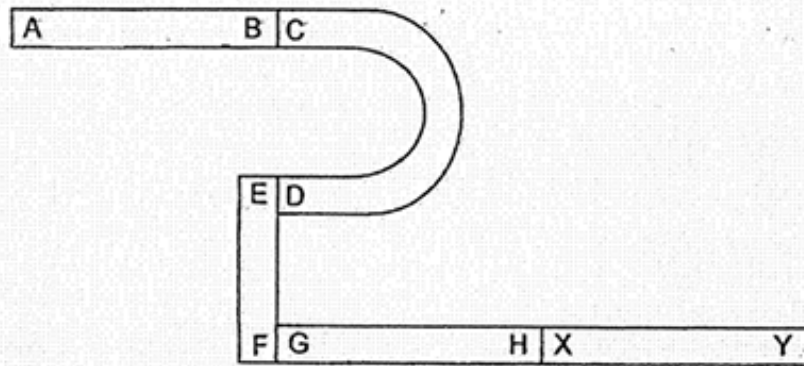


The plant was then put in the sun. After several hours, the leaf was plucked and the black papers were removed. The leaf was tested for food.

Which part(s), W, X, Y and Z, is/are food mostly found?

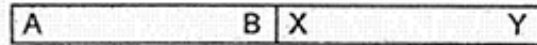
- (1) W only
- (2) X only
- (3) W and X only
- (4) Y and Z only

20 Five magnets are arranged as shown.

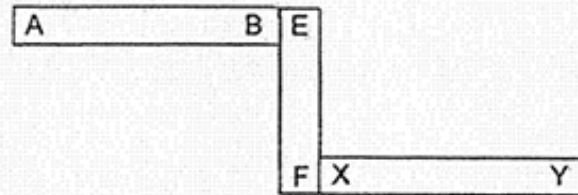


Which arrangement is **not** possible?

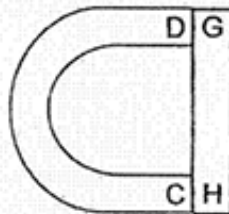
(1)



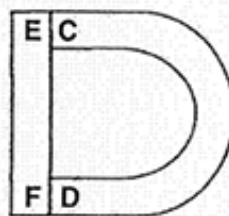
(2)



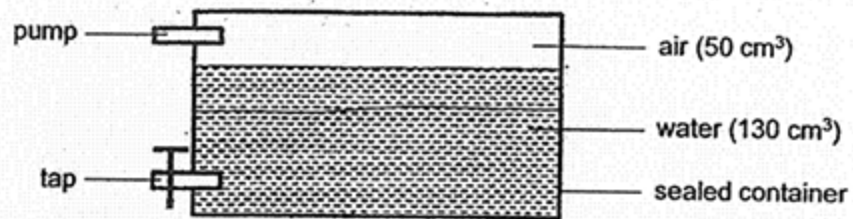
(3)



(4)



21 Study the diagram.

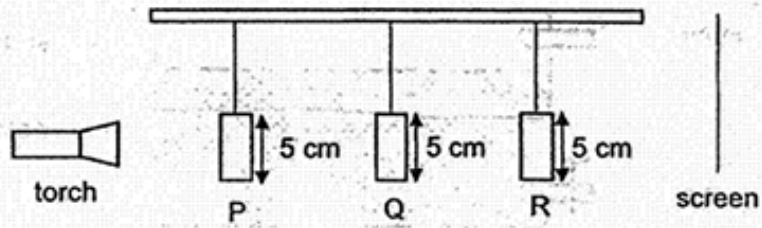


Mayah used the tap to remove 30 cm³ of water. She then used the pump to add 20 cm³ of air into the container.

What was the final volume of air in the container?

- (1) 50 cm³
- (2) 70 cm³
- (3) 80 cm³
- (4) 100 cm³

- 22 Shapes P, Q and R are made of cardboard. They are placed at different distances from the torch.















The shapes of the objects are as shown.



The diagram below shows the shadows that were cast on the screen.



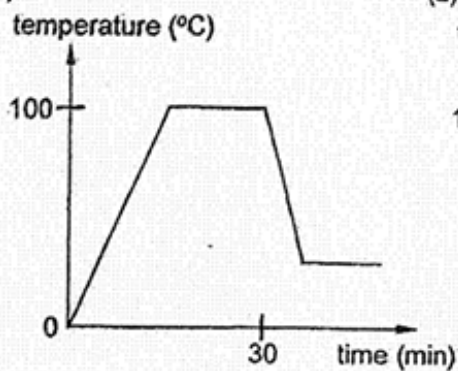
Which of the following correctly represents shapes, P, Q and R?

	P	Q	R
(1)			
(2)			
(3)			
(4)			

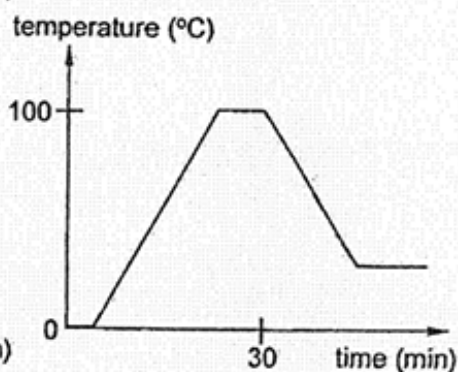
- 23 A beaker of ice was heated for 30 minutes and then left on the table to cool to room temperature. The changes in the temperature were recorded on a graph.

Which graph correctly shows the changes in the temperature over a period of time?

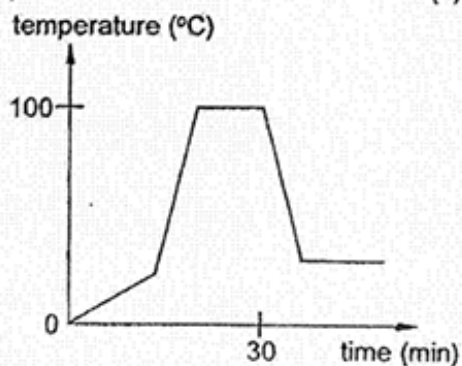
(1)



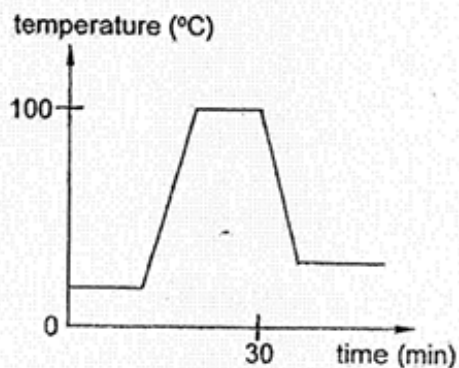
(2)



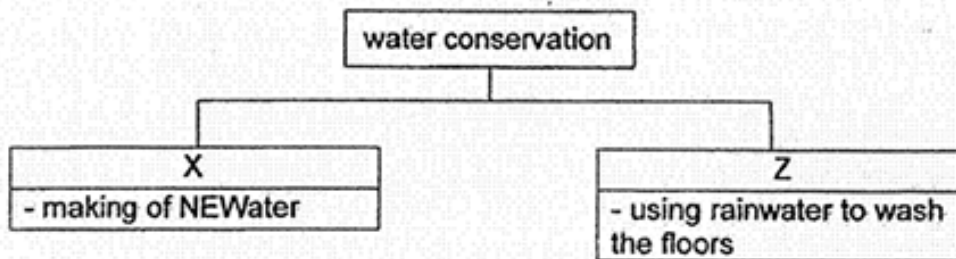
(3)



(4)



24 Study the diagram.



What do X and Z represent?

	X	Z
(1)	recycling	reducing
(2)	reducing	reusing
(3)	reusing	recycling
(4)	recycling	reusing

25 The table shows the melting and boiling points of substances A, B and C.

substance	melting point (°C)	boiling point (°C)
A	42	78
B	28	63
C	54	90

At which temperature will the three substances be in the same state?

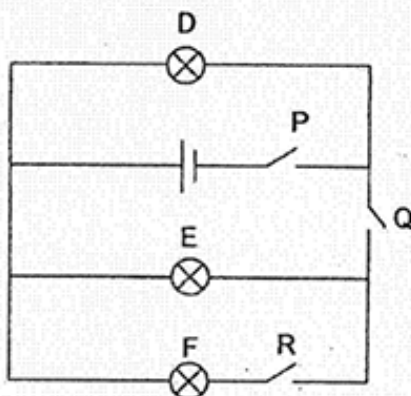
- (1) 32°C
- (2) 60°C
- (3) 75°C
- (4) 80°C

26 Which of the following actions can we take to conserve electricity?

- A use air-conditioners
- B use energy-saving light bulbs
- C switching on the water heater only when you need it
- D switching on the electrical appliances when they are not in use

- (1) A and B only
- (2) B and C only
- (3) A, C and D only
- (4) B, C and D only

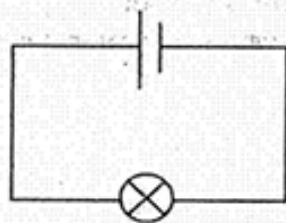
27 Bulbs D, E and F and switches P, Q and R are connected in a circuit as shown. All the components in the circuit are working properly.



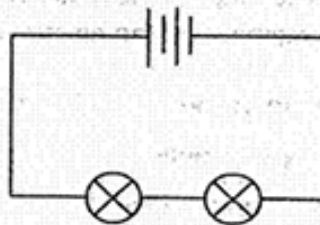
Which of the following is correct?

	Does the bulb light up?			Switch		
	D	E	F	P	Q	R
(1)	yes	yes	no	closed	closed	open
(2)	no	yes	no	open	closed	open
(3)	yes	no	yes	closed	open	closed
(4)	no	no	yes	open	open	closed

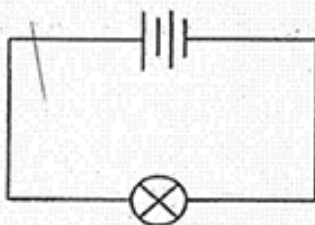
- 28 Suling wants to find out how the number of batteries will affect the brightness of the bulbs.



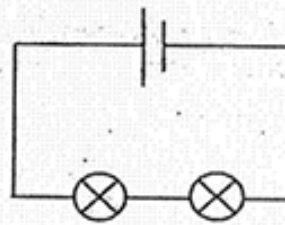
circuit R



circuit S



circuit T



circuit U

Which circuits should she use for her experiment?

- (1) R and S
- (2) R and U
- (3) S and U
- (4) T and U

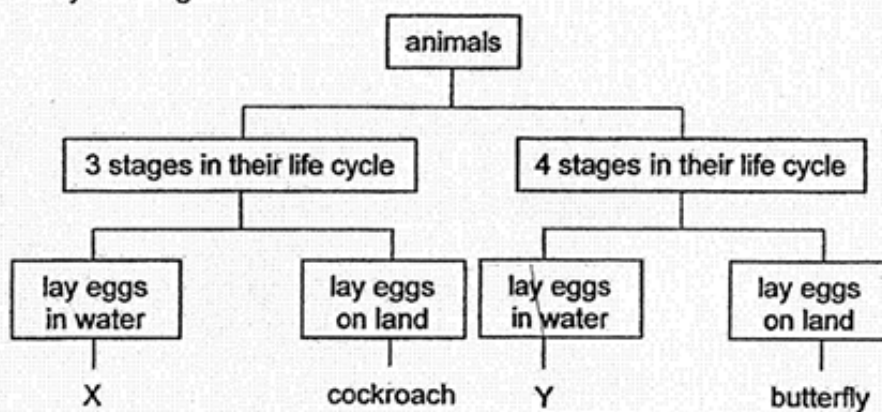
End of Booklet A

Booklet B (44 marks)

For questions 29 to 41, write your answers in this booklet.

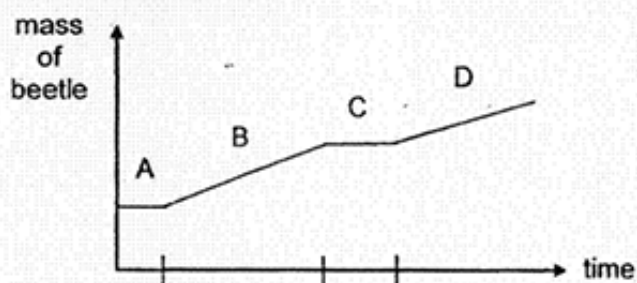
The number of marks available is shown in brackets [] at the end of each question or part question. (44 marks)

29 Study the diagram.



(a) Based on the diagram, state one difference between animals X and Y. [1]

The graph shows the mass of a beetle at different stages of its life cycle.



(b) Name stage C. Give a reason why there is no gain in mass during stage C. [1]

- 30 Siva observed plants P, Q and R growing on a piece of land as shown in diagram 1. After a few months, he visited the same piece of land and made the observations shown in diagram 2.

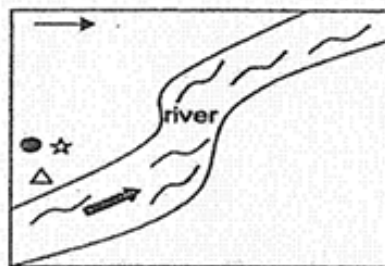


diagram 1

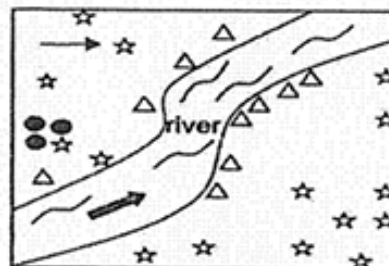


diagram 2

Key

△ plant P

☆ plant Q

● plant R

→ direction of water flow

→ direction of wind

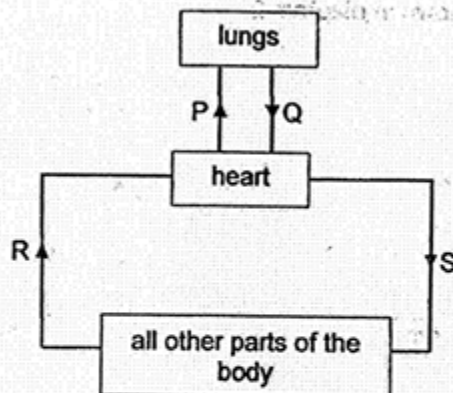
- (a) Based on the physical characteristics of the three fruits shown, which fruit is likely to be the fruit of plant Q? Put a tick (✓) in the appropriate box. [1]



- (b) Explain your choice in (a). [2]

- (c) Explain why it is important for seeds to be dispersed. [1]

- 31 The diagram shows the direction of blood flow in some parts of the human body.



- (a) Which arrow, P, Q, R or S, represents the flow of blood that contains the greatest amount of carbon dioxide? Give a reason.

[1]

Muthu wanted to find out how his pulse rate would change with different activities. He recorded his pulse rate immediately after each activity in the table.

activity	pulse rate per minute
P	75
Q	85
R	95
S	115

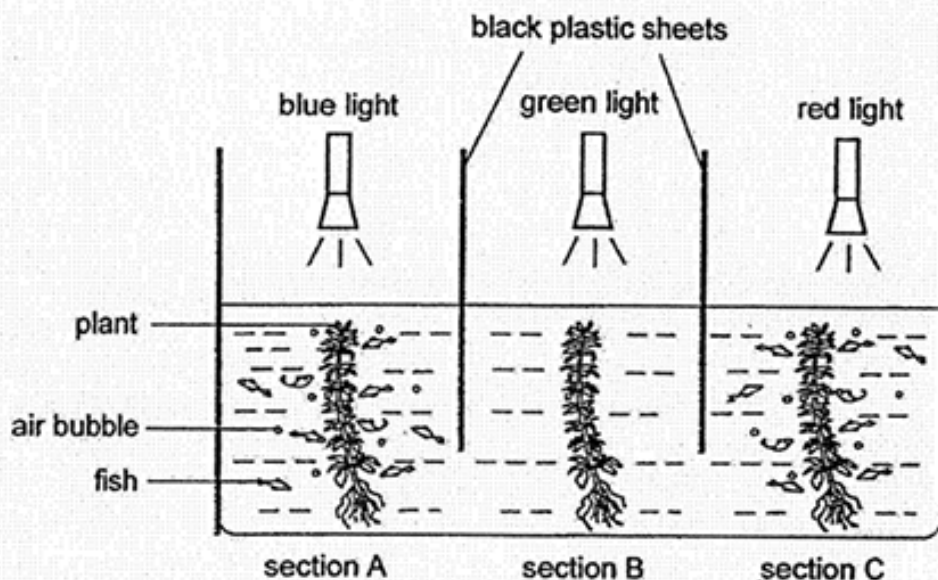
- (b) Suggest one variable that Muthu had to keep constant.

[1]

- (c) Muthu's pulse rate at rest was 65 beats per minute. Explain why his pulse rate increased when doing activity S.

[2]

- 32 Jasmine wanted to find out how different coloured lights affect the rate of photosynthesis. She set up a tank as shown in a dark room. She then introduced some fish into each section with the same amount of water plant.

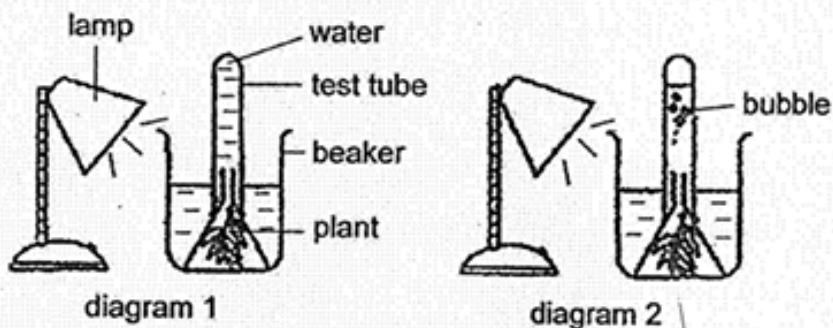


- (a) Explain why the fish were found in sections with blue and red lights. [1]

- (b) Which coloured light(s) could be used for photosynthesis? [1]

- (c) Jasmine's teacher suggested that she repeated her experiment with the same set-up. Why did her teacher say that? [1]

Jasmine set up another experiment as shown in diagram 1 to find out how the rate of photosynthesis of a plant is affected by light intensity. Diagram 2 shows some bubbles observed in the test tube at the end of the experiment.



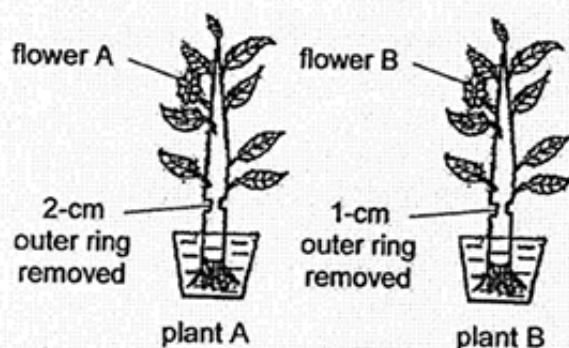
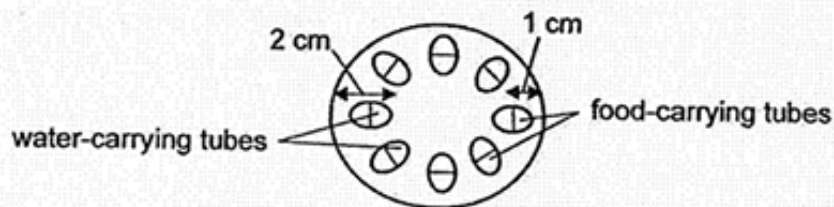
She recorded the number of bubbles produced per minute.

light intensity (units)	number of bubbles produced per minute
10	1
20	3
30	4
40	5
50	6

- (d) State the relationship between the light intensity and the rate of photosynthesis. [1]

- (e) Suggest one other change Jasmine could make to the set-up in order to collect more bubbles. [1]

33. Huimin placed two similar plants, A and B, in two identical pots containing the same amount of blue-coloured water. She made a 2-cm cut to the stem of plant A and a 1-cm cut to the stem of plant B.



A day later, she noticed flower A remained white while flower B had turned blue.

- (a) Explain why flower A remained white.

[1]

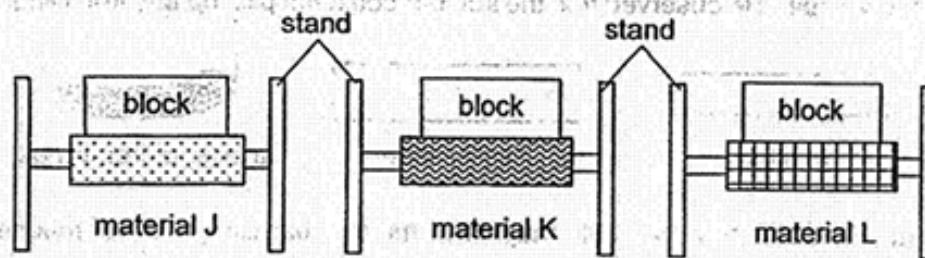
- (b) Huimin also found that the stem below the cut section of plants A and B shrivelled after a few days. Explain why.

[1]

- (c) Suggest a control set-up.

[1]

- 34 Chitra conducted an experiment by putting similar blocks of different masses onto three materials, J, K and L.



She recorded the mass that each material could hold before it broke in the table as shown.

Material	Mass of blocks each material could hold before it broke (g)
J	1200
K	2600
L	600

- (a) State the property that Chitra was testing. [1]

- (b) Put a tick (✓) in the box(es) below to indicate the changed variable. [1]

variables	changed
type of material	
mass of blocks	
thickness of material	

- (c) Which material should Chitra choose to make a chair?
Explain why. [1]

- 35 Dave was given an iron bar, a bar magnet and a bowl of iron filings as shown. His teacher asked him to pick up the iron filings from the bowl using the iron bar. He observed that the iron bar could not pick up any iron filings.



iron bar



bar magnet

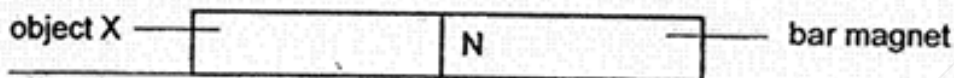


a bowl of iron filings

- (a) Describe how he could magnetise the iron bar using the bar magnet so that he could pick up the iron filings from the bowl. [2]

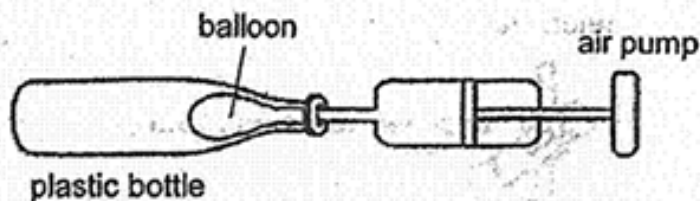
- (b) Dave then decided to use a glass rod instead of the iron bar for part (a). However, the method could not work. Explain why. [1]

Next, his teacher gave him object X. She told him to put the bar magnet and object X near to each other. He observed that object X was attracted to the bar magnet as shown in the diagram.



- (c) Dave concluded that object X was a magnet. Do you agree with him? Give a reason. [1]

36 Junwei placed a balloon into a plastic bottle.

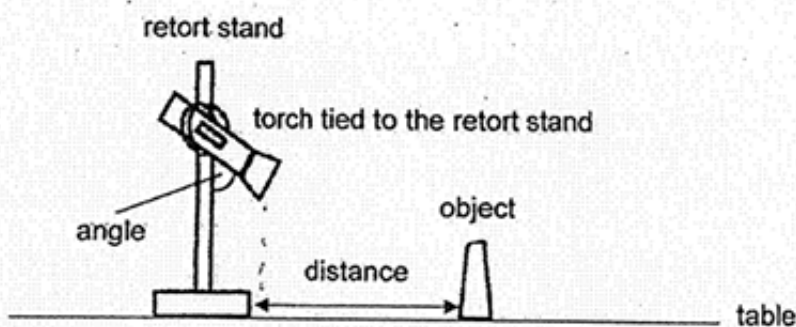


- (a) Junwei tried inflating the balloon using the air pump but found it difficult to do so. Explain why. [1]

- (b) Without adding or removing anything in the set-up, what could Junwei do to make it easier for him to inflate the balloon inside the plastic bottle? [1]

- (c) Explain your answer in part (b). [1]

37 Study the set-up.



The table shows the results of the experiment.

distance of object from torch (cm)	length of shadow cast on the table (cm)
10	7
20	15
30	22

(a) What was the aim of the experiment?

[1]

(b) Based on the experiment, why was the shadow formed on the table?

[1]

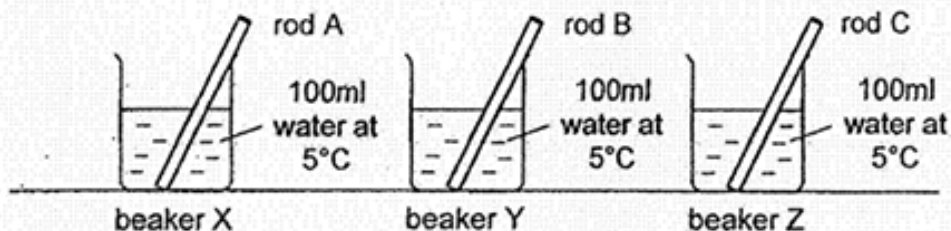
(c) Give a reason how keeping the angle of the torch shining at the object constant make the experiment a fair test.

[1]

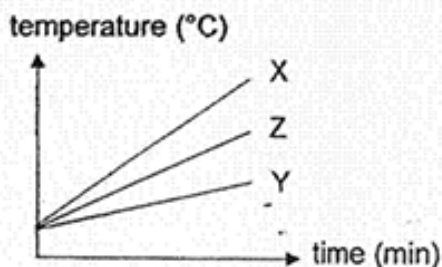
- 38 Ahmad had three rods, A, B and C, made of different materials. When he touched the rods with his hands, rod A felt the coldest, followed by rod C and then rod B.

(a) Give a reason why Ahmad's hand felt cold when he touched the rods. [1]

Then, Ahmad heated the rods to 90°C . He placed each rod into a beaker of water.

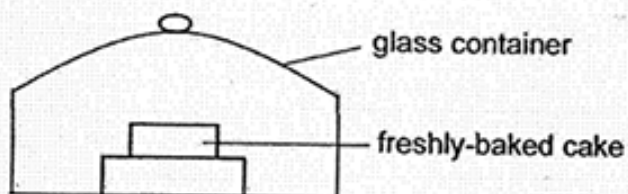


He left the beakers in his room and measured the temperature of water in each beaker over a period of time. The graph shows the results.



- (b) Based on the results, which rod should be placed in a cup of hot tea to cool the tea the fastest? Explain why. [2]

- 39 Mrs Chen took a freshly-baked cake out of the hot oven and immediately placed it in a glass container as shown.



Some water droplets were observed on the inner surface of the glass container a few minutes later.

- (a) Explain how the droplets of water were formed.

[2]

Mrs Chen and her daughter then baked another cake and left it to cool in the kitchen for half an hour before putting it in another glass container.

- (b) Compared to part (a), would the amount of water droplets observed on the inner surface of the glass container increase, decrease or remain the same a few minutes after the cake was placed in the glass container? Explain your answer.

[1]

Continue from question 39

After the baking session, Mrs Chen's daughter washed her hair. Then, she tied her wet hair as shown in diagram 1.

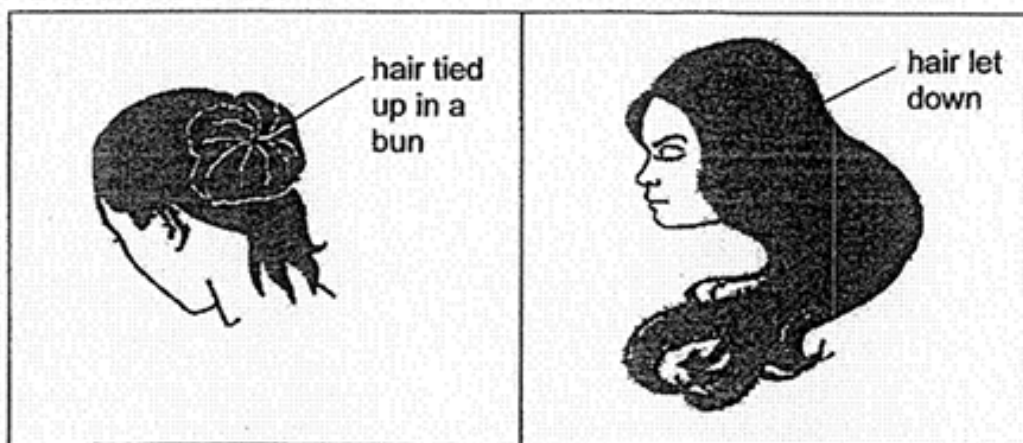


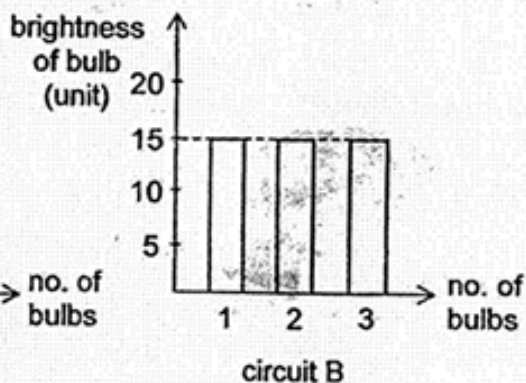
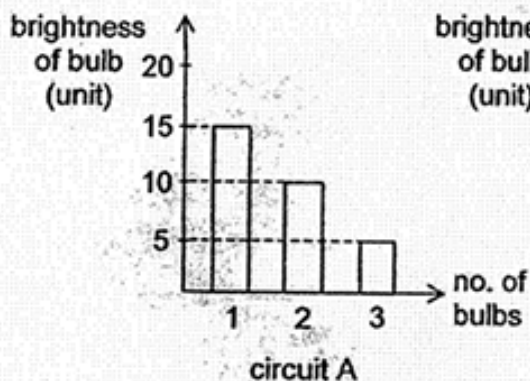
diagram 1

diagram 2

- (c) Mrs Chen told her that her hair would dry faster if she let it down as shown in diagram 2. Do you agree with her mother? Explain why. [1]

- (d) State another way the daughter could dry her hair faster. [1]

- 40 The graphs show the relationship between the number of bulbs and the brightness of the bulbs in circuit A and circuit B. All the bulbs and batteries are identical.

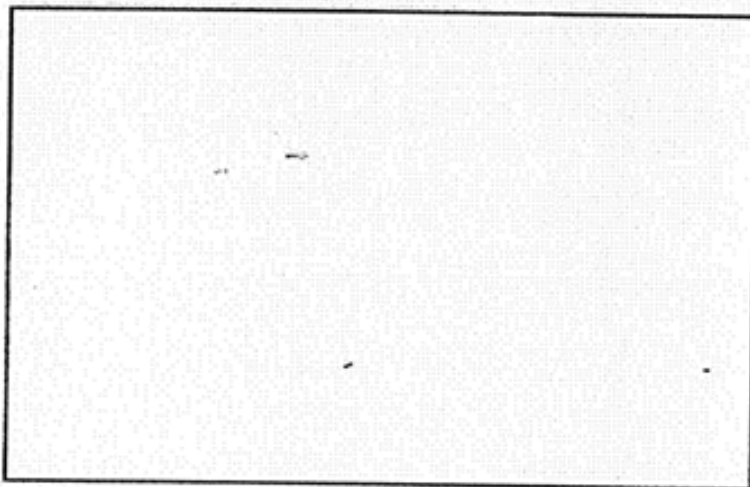


- (a) Based on the above graphs, state the arrangement of the bulbs in each of the circuits. [1]

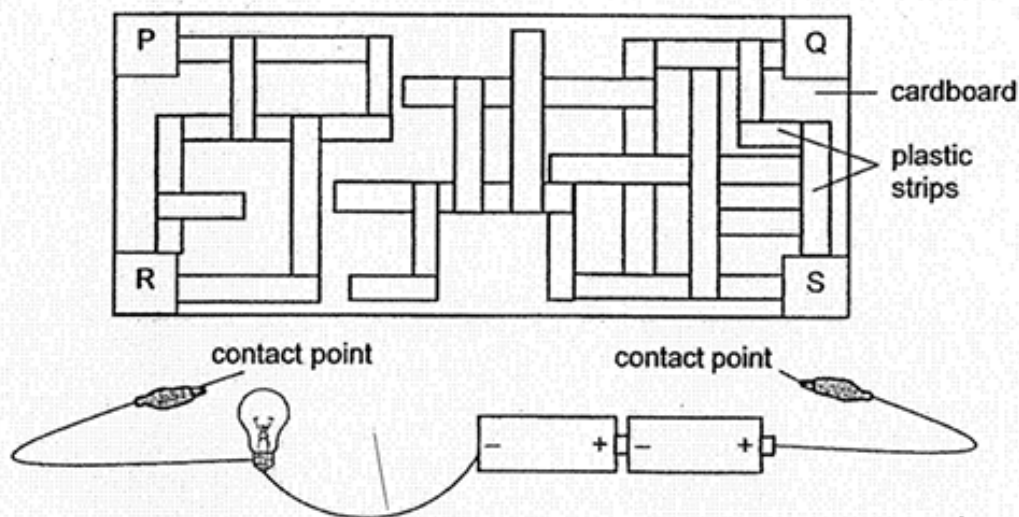
circuit A: _____

circuit B: _____

- (b) Complete the circuit diagram of circuit B in the box. The batteries have been drawn for you. [1]



- 41 Jack made a circuit maze with strips of plastic on a cardboard as shown. The four corners labelled P, Q, R and S were made of aluminium foil.




- (a) When Jack clipped the contact points to corners Q and S in the circuit maze, the bulb did not light up. Explain why. [1]
- _____
- _____
- (b) Suggest what Jack should do to solve the problem in part (a). [1]
- _____
- _____
- (c) Once Jack had solved the problem, he clipped the contact points to corners R and S. He noticed that the bulb still did not light up. Explain why. [1]
- _____
- _____

ANSWER SHEET

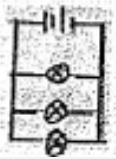
Booklet A

Q1	4	Q2	2	Q3	3	Q4	3	Q5	2
Q6	3	Q7	4	Q8	2	Q9	1	Q10	4
Q11	1	Q12	2	Q13	4	Q14	2	Q15	3
Q16	3	Q17	1	Q18	1	Q19	2	Q20	4
Q21	3	Q22	1	Q23	2	Q24	4	Q25	2
Q26	2	Q27	1	Q28	3				

Booklet B

Q29	<p>(a) Animal X has 3-stage life cycle but animal Y has 4-stage life cycle.</p> <p>(b) Pupa stage. The pupa does not eat.</p>
Q30	 <p>(a) <input checked="" type="checkbox"/></p> <p>(b) Fruit Q has hook-like structures that can hook onto the body covering of animals or human clothing. The fruit loosens and drops off when the animal moves to different locations.</p> <p>(c) This is to reduce overcrowding so that the young plants and the adult plant do not compete for sunlight, water, nutrients and space.</p>
Q31	<p>(a) Arrow P. Blood rich in carbon dioxide produced by all parts of the body is transported to the heart and then the lungs to be exhaled.</p> <p>(b) The duration for each activity/the time he took to do for each activity.</p> <p>(c) His heart needs to pump harder to carry blood faster to supply more oxygen and more digested food to various parts of the body to release more energy.</p>
Q32	<p>(a) The plants with blue and red lights could carry out photosynthesis and produced oxygen for the fish.</p>

	<p>(b) blue and red lights</p> <p>(c) To ensure that the results are more reliable.</p> <p>(d) As the light intensity increases, the photosynthesis also increases.</p> <p>(e) – add more water plants</p> <p>- add baking soda where water plant is</p>
Q33	<p>(a) The water-carrying tubes of plant A were removed so the blue-coloured water absorbed by the roots could not be transported to the flower.</p> <p>(b) As the food-carrying tubes were cut off, food made by the leaves could not be transported to the other parts of the plant below the cut/roots.</p> <p>(c) A similar set-up with no cuts on the plant.</p>
Q34	<p>(a) strength</p> <p>(b) tick : type of material</p> <p>(c) Material K. Material K could hold the greatest mass of blocks before it broke so it was the strongest material.</p>
Q35	<p>(a) Stroke the iron bar with one pole of the magnet repeatedly.</p> <p>(b) Glass is a non-magnetic material so it cannot be magnetised.</p> <p>(c) No. There was no repulsion.</p>
Q36	<p>(a) There was air in the bottle and air occupies space.</p> <p>(b) He could poke a hole in the plastic bottle.</p> <p>(c) The air in the bottle could escape from the plastic bottle so that the balloon could take up the space previously occupied by the air in the bottle.</p>
Q37	<p>(a) To find out how the distance of object from the torch affects the length of shadow cast on the table.</p> <p>(b) Light travels in a straight line. The light from the torch was blocked by the object, causing the shadow to be formed on the table.</p> <p>(c) To ensure that the object received the same amount of light.</p>
Q38	<p>(a) Ahmad's hand lost heat to the rods.</p> <p>(b) Rod A. The temperature of water in the beaker increased the fastest so rod A was the best conductor of heat as it conducted the heat away from the hot tea to the rod the fastest.</p>
Q39	<p>(a) The warm water vapour from the cake then came into contact with the cooler inner surface of the glass container, lost heat and condensed to form water droplets.</p> <p>(b) Decrease. Some of the water would have evaporated from the cake so less water vapour could condense</p>

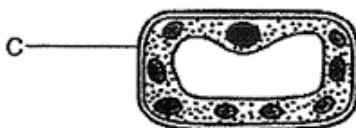
	<p>(c) Yes. The exposed surface area of the wet hair would be greater so that the rate of evaporation of water would be faster.</p> <p>(d) She could dry her hair with a dryer.</p>
Quiz 2 Q2	<p>(a) Circuit A: series Circuit B: parallel</p>  <p>(b)</p>
Quiz 2 Q3	<p>(a) The plastic strips were electrical insulators so there was an open circuit and electric current could not flow through the circuit.</p> <p>(b) Replace the plastic strips with metal strips.</p> <p>(c) The strips were not touching each other, so there is still an open-circuit so electric current could not flow through the circuit.</p>

MAHA BODHI SCHOOL SA2 PAPER

BOOKLET A : [28 x 2 marks = 56 marks]

For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). **Shade your answer on the Optical Answer Sheet.**

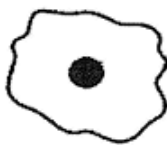
1. The diagram below shows a cell.



Which of the following statements is correct about part C of this cell?

- (1) It controls all the activities in the cell.
- (2) It supports and gives the cell its shape.
- (3) It is where cell activities take place in the cell.
- (4) It contains information passed from parents to their young.

2. The diagram below shows two cells, X and Y.



Cell X



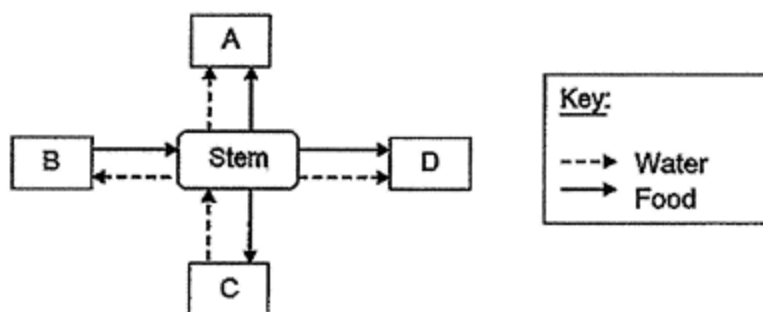
Cell Y

Which of the following statements about these cells is/are correct?

- A. Cells X and Y are found in plants.
- B. Cells X and Y have fixed shape.
- C. Cell Y can trap light energy but Cell X cannot.
- D. Cell X can reproduce on its own but Cell Y cannot.

- (1) C only
- (2) A and B only
- (3) C and D only
- (4) A, B and D only

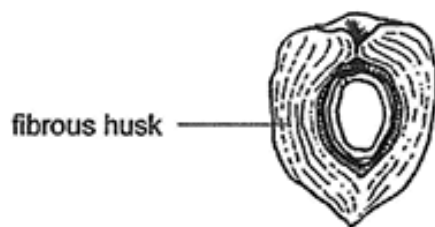
3. Which of the following is a function of the human circulatory system?
- (1) protects organs in the body
 - (2) protects the muscular system
 - (3) carries substances around the body
 - (4) exchange gases with the surroundings
4. Which of the following statements about the air we breathe out is correct?
- (1) It is less warm than the air that we breathe in.
 - (2) It has less oxygen than the air that we breathe in.
 - (3) It has less water vapour than the air that we breathe in.
 - (4) It has lesser carbon dioxide than the air that we breathe in.
5. The diagram below shows how water and food are transported to and from different parts, A, B, C and D, of a plant.



Which of the following correctly shows the parts of a plant that A, B, C and D represent?

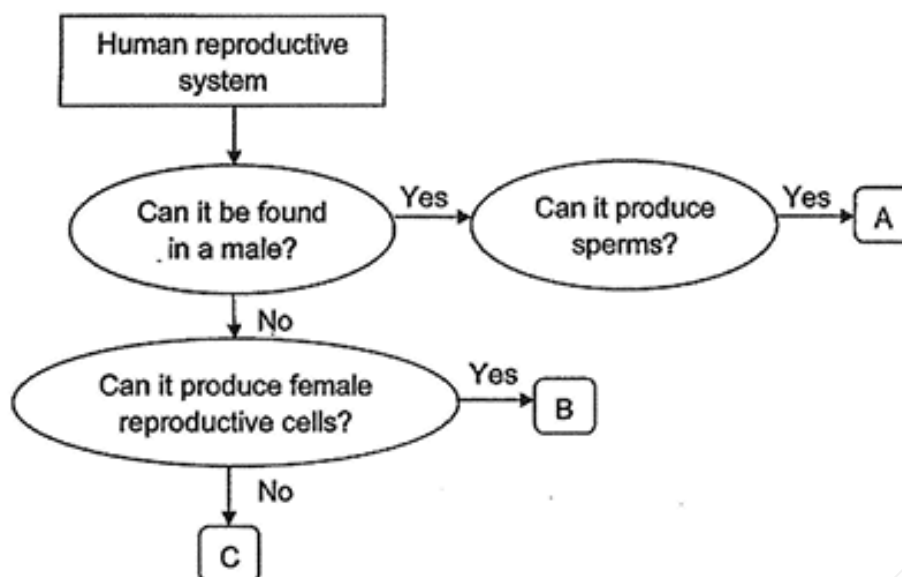
	A	B	C	D
(1)	fruits	roots	flowers	leaves
(2)	fruits	leaves	roots	flowers
(3)	roots	leaves	fruits	flowers
(4)	leaves	flowers	roots	fruits

6. Study the fruit shown below.



How is the seed in the fruit above dispersed?

- (1) by wind
 - (2) by water
 - (3) by animals
 - (4) by splitting
7. The flow chart below is used to identify the different parts of the human reproductive system.



What are parts A, B and C?

	A	B	C
(1)	penis	egg	womb
(2)	penis	ovary	vagina
(3)	testes	egg	ovary
(4)	testes	ovary	womb

8. Which of the following show the similarity in the reproduction of flowering plants and humans?

- A. Pollination must occur before fertilisation.
- B. Both involve the production of male and female reproductive cells.
- C. Fertilisation occurs when the male reproductive cell fuses with an egg cell.
- D. The male reproductive cell travels down the style to meet the egg cell in the ovary.

- (1) A and B only
- (2) B and C only
- (3) B, C and D only
- (4) A, B, C and D

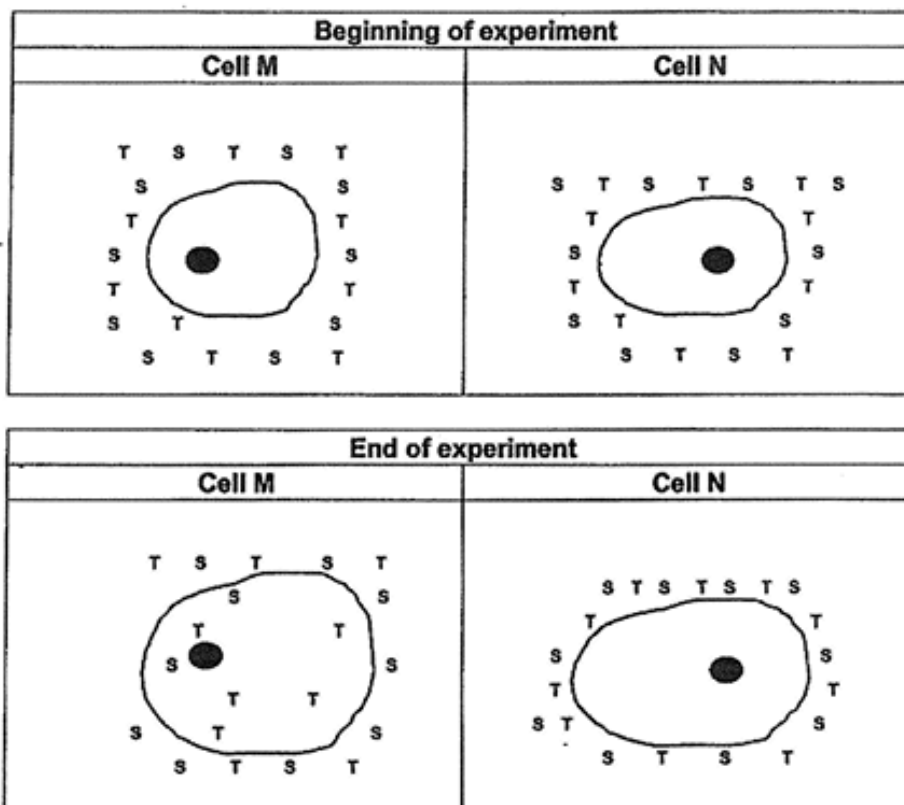
9. The table below shows some information about two animals, Q and P.

Characteristics	Animal Q	Animal P
the young resembles the adult	No	No
3-stage life cycle	No	Yes
spends part of its life cycle in water	Yes	Yes

Which of the following correctly shows what Animal Q and Animal P could represent?

	Animal Q	Animal P
(1)	butterfly	frog
(2)	butterfly	cockroach
(3)	cockroach	mosquito
(4)	mosquito	frog

10. Mr Lim carried out an experiment by placing two different cells, M and N, in separate dishes containing water and equal amounts of two substances, S and T. Cells, M and N, could expand when water and other substances entered them. The diagrams below show the observations made at the beginning and end of the experiment.

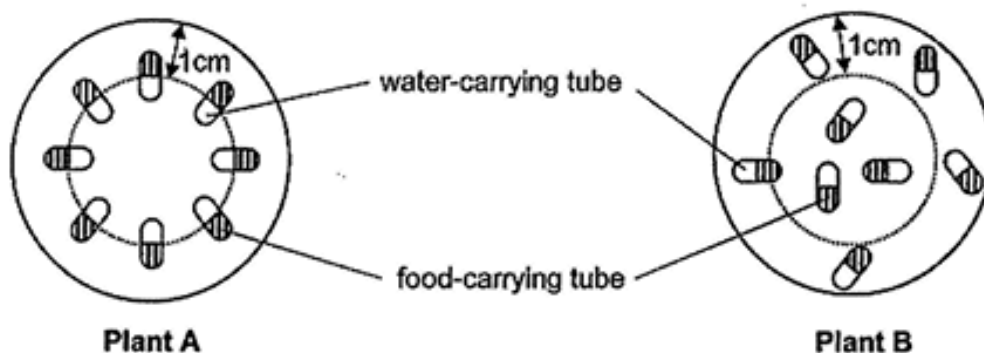


Cell M and Cell N were bigger at the end of the experiment.

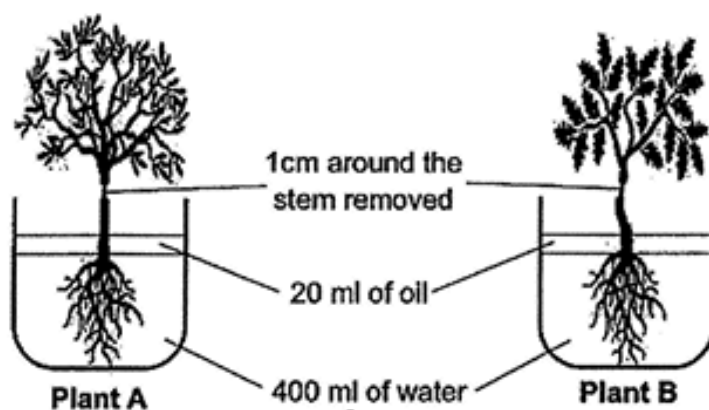
Which of the following statements are correct?

- A. Only Cell M had a cell membrane.
 - B. The cell membrane of Cell N allowed water to enter.
 - C. The cell wall of Cell N prevented the substances from entering.
 - D. The cell membrane controlled the substances entering the cells.
- (1) A and C only
 (2) B and C only
 (3) B and D only
 (4) A, C and D only

11. The cross sections of the stem of plants A and B are shown below.



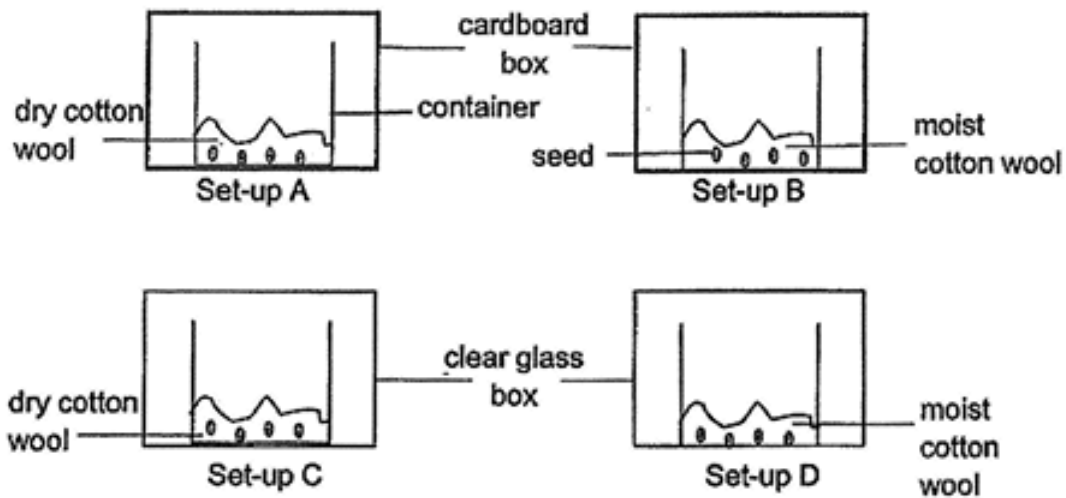
Gary removed 1cm around each stem and put the plants into beakers of water. The amount of water in each container is the same at the start of the experiment.



Which of the following would he likely to observe after 5 days?

	Amount of water left in container with plant A (ml)	Amount of water left in container with plant B (ml)
(1)	350	350
(2)	350	370
(3)	370	350
(4)	400	400

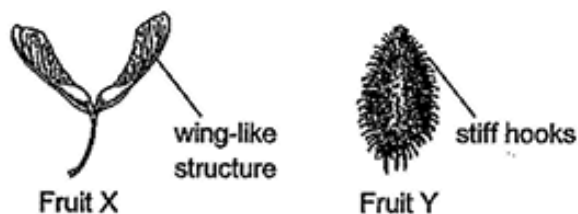
12. Joyce wanted to find out if light is required for seeds to germinate. She placed same number of seeds into each container at the same place as shown below.



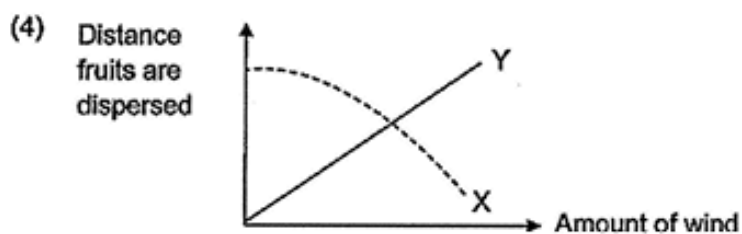
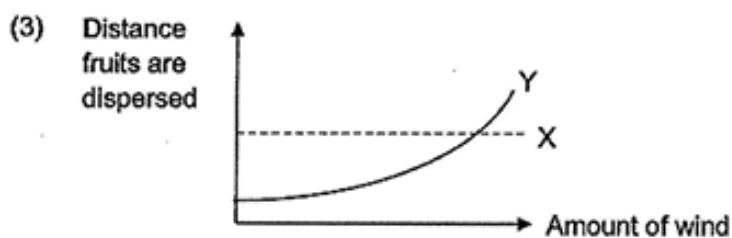
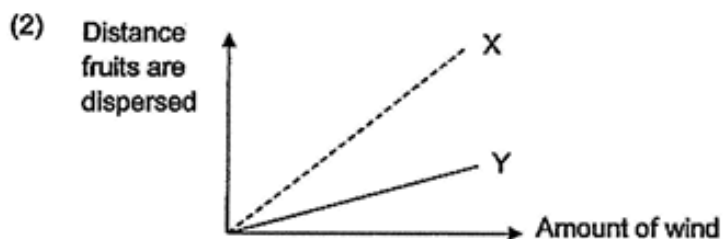
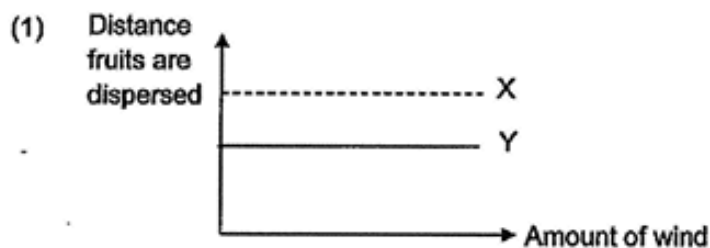
Which two set-ups should she use to ensure that it was a fair test?

- (1) A and B
- (2) A and C
- (3) B and D
- (4) C and D

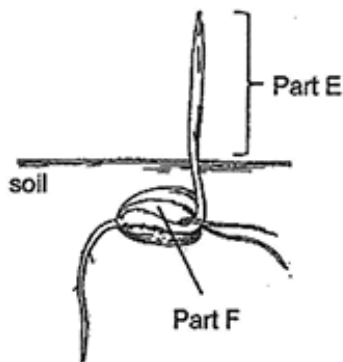
13. Look at the diagrams below.



Which of the following graphs shows the relationship between the distance fruits X and Y are dispersed from their parent plants and the amount of wind present?

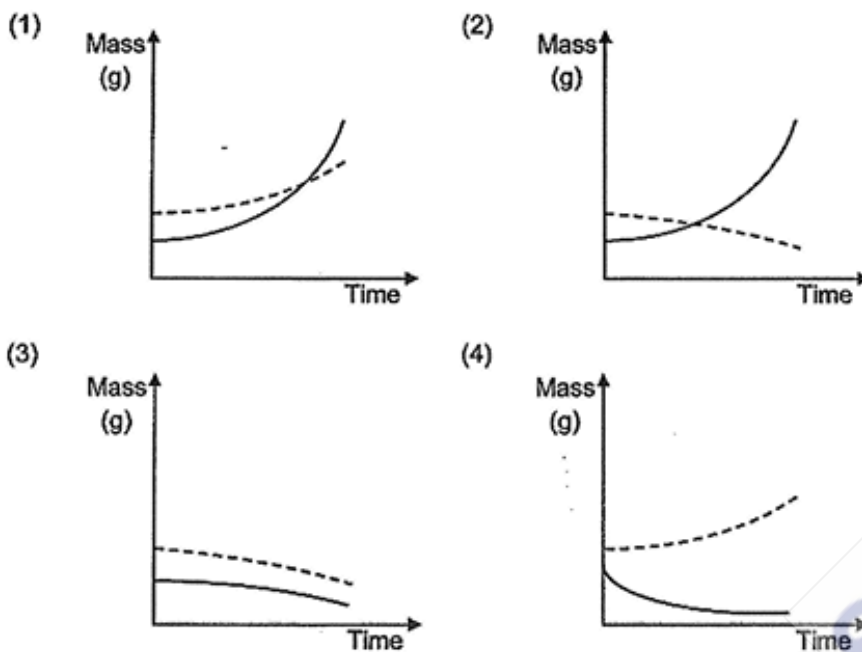
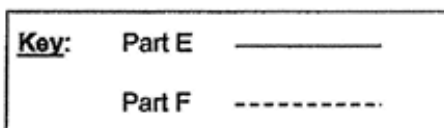


14. The diagram below shows a young plant growing in some soil. This plant is watered daily.

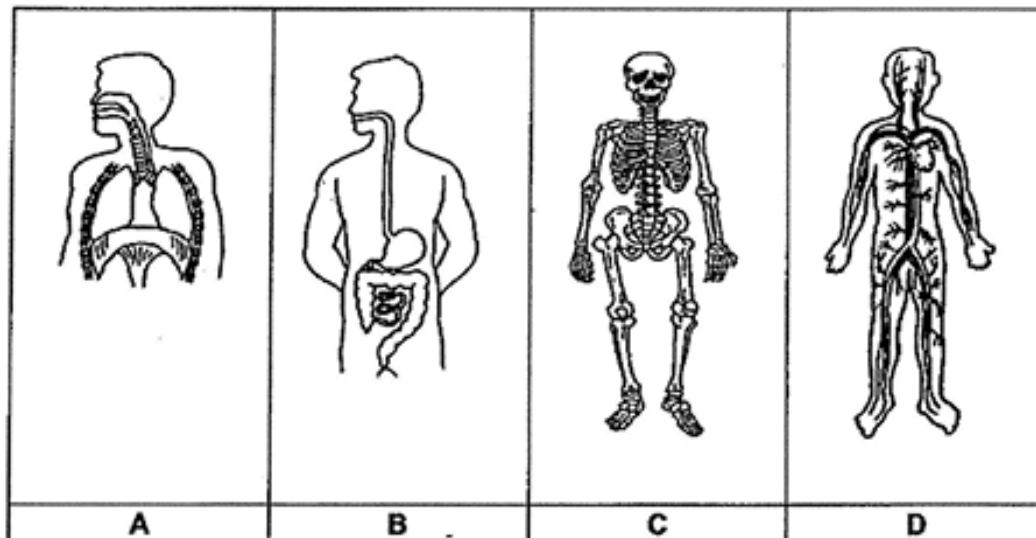


As the young plant grows, parts E and F change in mass.

Which of the following graphs shows correctly the change in the mass of parts E and F over a period of 1 week?



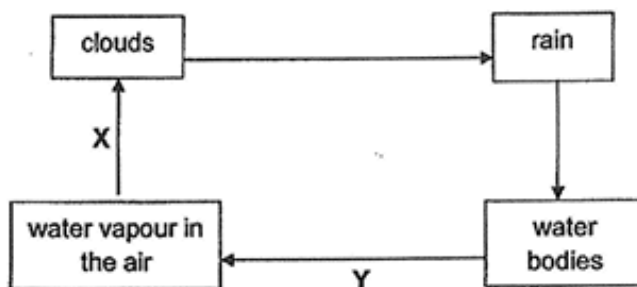
15. The diagrams below show four different systems in Ming Wei's body.



Ming Wei is taking part in a running race. Which of the systems enable Ming Wei to obtain more energy when he starts running?

- (1) A and C only
- (2) B and D only
- (3) A, C and D only
- (4) A, B and D only

16. The diagram below shows the water cycle. X and Y represent different processes in the water cycle.



Which of the following correctly shows the gain or loss of heat during processes, X and Y?

	X	Y
(1)	heat is lost by the water vapour	heat is gained by the water
(2)	heat is gained by the water vapour	heat is lost by the water
(3)	heat is lost by the water vapour	heat is lost by the water
(4)	heat is gained by the water vapour	heat is gained by the water

17. Amos left three cubes of ice of different sizes on the dining table at the same time.

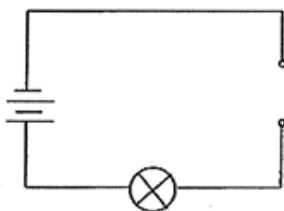


Which one of the following statements about the melting ice cubes is true?

- A. Ice cube P had the lowest temperature.
- B. The time taken to melt the ice cubes was the same.
- C. All the ice cubes would have a temperature of more than 0°C .
- D. Ice cube R required more heat to melt completely than ice cube Q.

- (1) B only
- (2) D only
- (3) A and B only
- (4) C and D only

18. Sam carried out an experiment using a circuit tester, as shown in the diagram, to find out which materials A, B, C and D are electrical conductors.



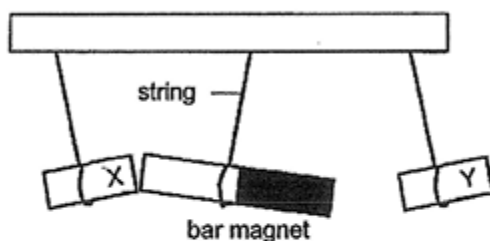
The results are recorded in the table below.

Material	Bulb lighted up	Bulb did not light up
A	✓	
B	✓	
C	✓	
D		✓

Which of the following correctly represents materials A, B, C and D?

	Material A	Material B	Material C	Material D
(1)	copper	iron	rubber	cotton
(2)	gold	cardboard	copper	wood
(3)	aluminum	steel	styrofoam	ceramic
(4)	steel	gold	iron	styrofoam

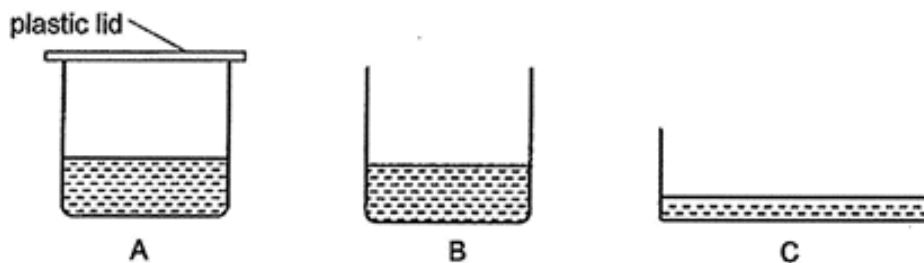
19. Two pieces of unknown metals, X and Y, and a bar magnet are hung from a support as shown below.



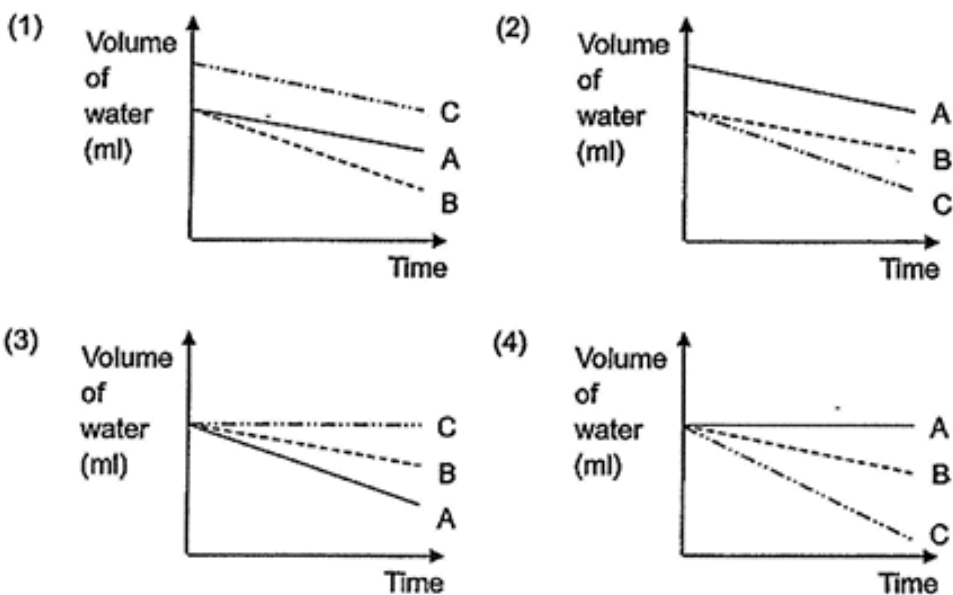
Which of the following is definitely true about X or Y?

- (1) X is a magnet.
- (2) Y is a magnet.
- (3) Y is made of silver.
- (4) X is made of copper.

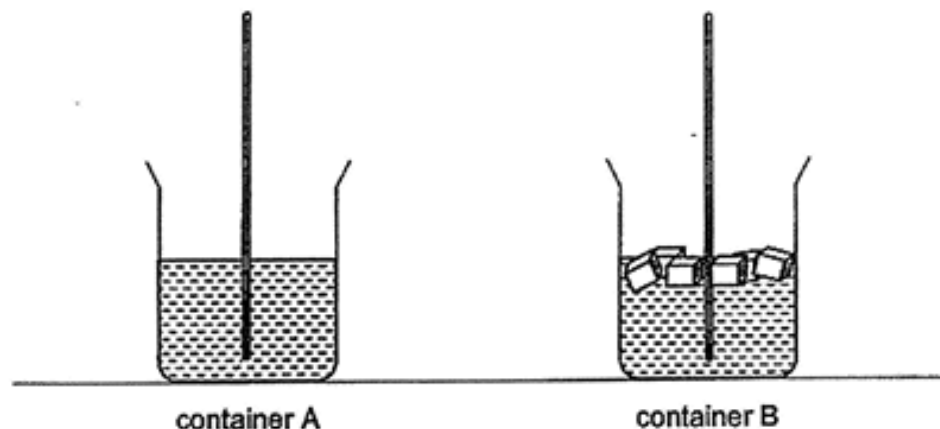
20. Jenny had 3 containers, A, B and C, made of the same material but of different size. They were filled with the same amount of water. Container A was covered with a plastic lid while the other 2 containers, B and C, were left uncovered. She left the three containers in the Parade Square on a hot and sunny day.



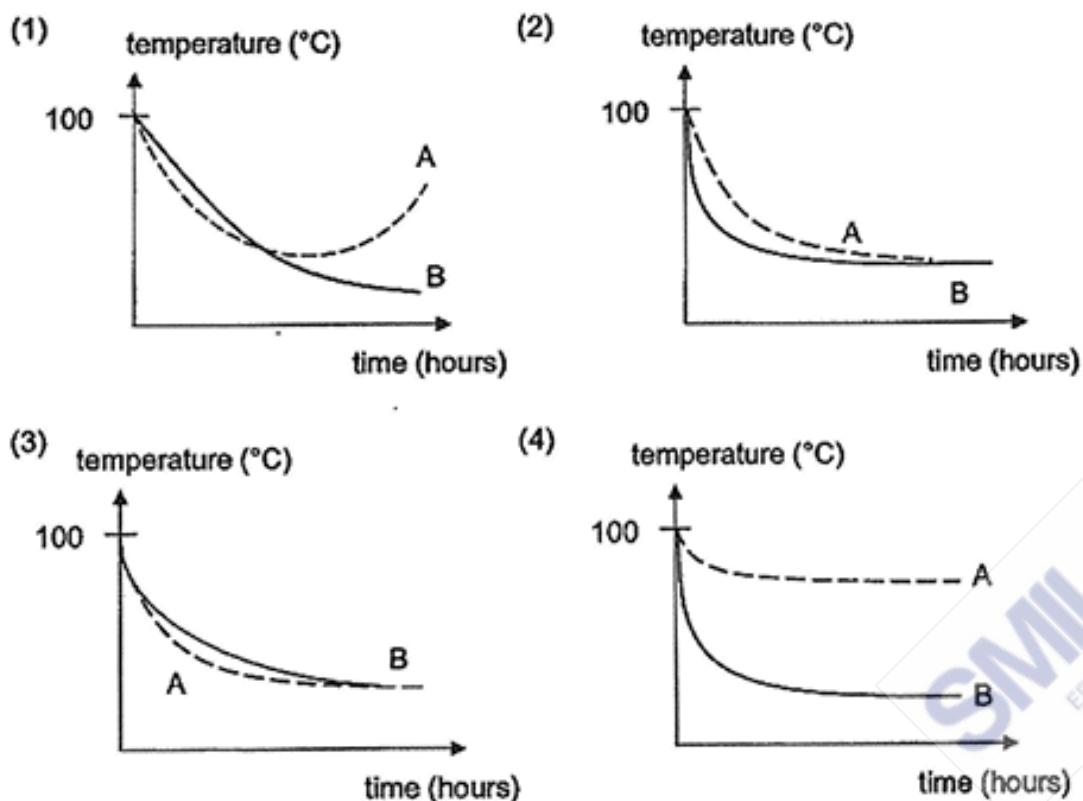
Which of the following graphs correctly shows the change in the amount of water in the containers?



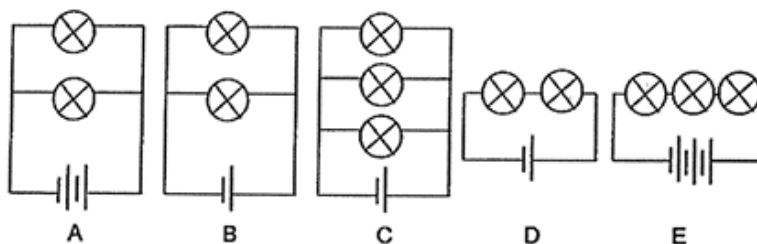
21. Sophie placed 100 cm^3 of boiling water into 2 containers, A and B. She then placed some ice cubes into container B before measuring the temperature of the water of both containers for 3 hours.



Which of the following graphs shows her results?

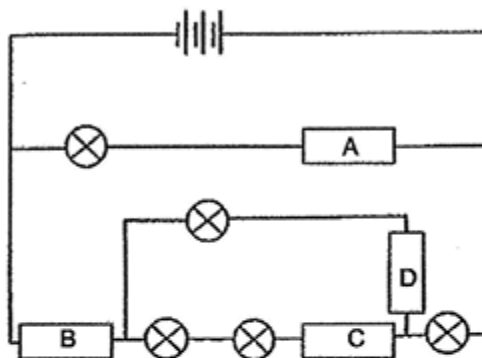


22. Aerith wanted to find out if the arrangement of bulbs in a circuit would affect their brightness. She set up circuits A, B, C, D and E below using identical parts.



Which of the following circuits should she use to ensure a fair test?

- (1) A and B
 - (2) A and D
 - (3) B and D
 - (4) C and E
23. Four objects, A, B, C and D, were arranged in an electric circuit as shown in the diagram below. Two of these objects were electrical conductors and the other two were electrical insulators.

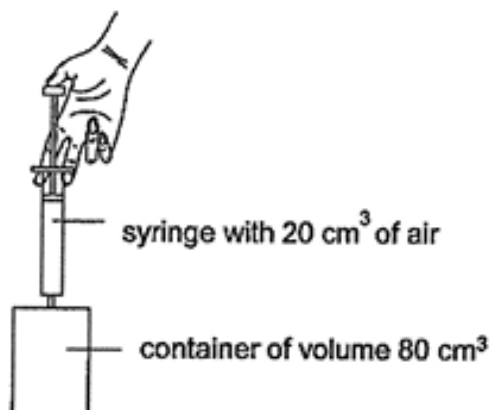


The arrangement only allowed two bulbs to light up.

Which of the following shows the correct property of the four objects, A, B, C and D?

	Electrical conductors	Electrical insulators
(1)	A and B	C and D
(2)	A and D	B and C
(3)	C and D	A and B
(4)	B and D	A and C

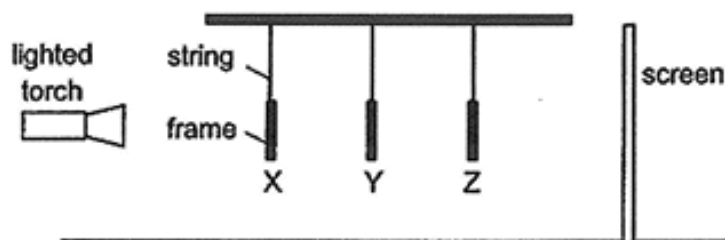
24. The diagram below shows air being pumped from a syringe into a container which has a volume of 80 cm^3 . The container has an original mass of 200 g .



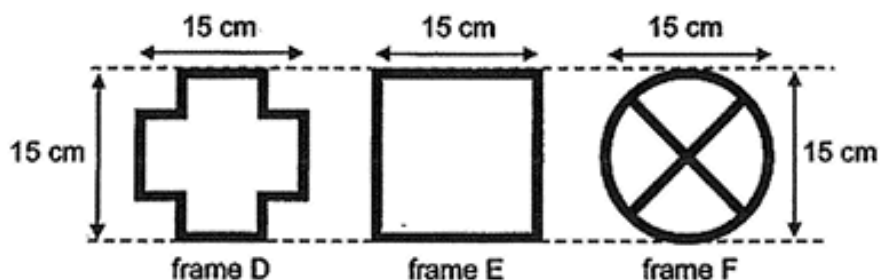
Which of the following shows the mass of the container and the volume of air in the container after all the air in the syringe is pumped into the container?

	mass of container (g)	volume of air in container (cm^3)
(1)	200	80
(2)	200	100
(3)	more than 200	80
(4)	more than 200	100

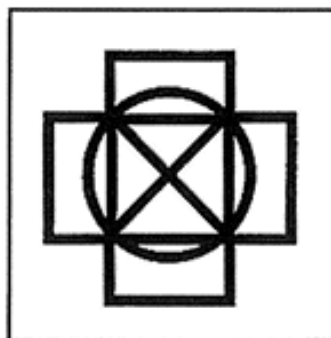
25. The set-up below shows light shining on three wooden frames, D, E and F, which are placed at different positions, X, Y and Z, from a torch.



The experiment is conducted in a dark room. The diagrams below show the three frames D, E and F, and their shadows formed on the screen.



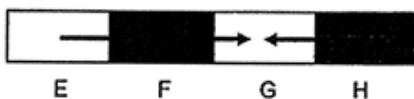
shadows of the frames
cast on the screen



Based on the shadows cast on the screen, which of the following shows correctly the frames at positions X, Y and Z?

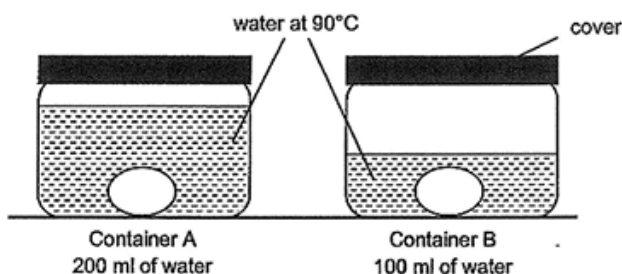
	Position X	Position Y	Position Z
(1)	D	E	F
(2)	E	F	D
(3)	F	D	E
(4)	D	F	E

26. Four objects E, F, G and H are arranged as shown in the diagram below. The arrows show the direction in which heat travels between the objects.



Which of the following statements about the temperature of the objects is / are correct?

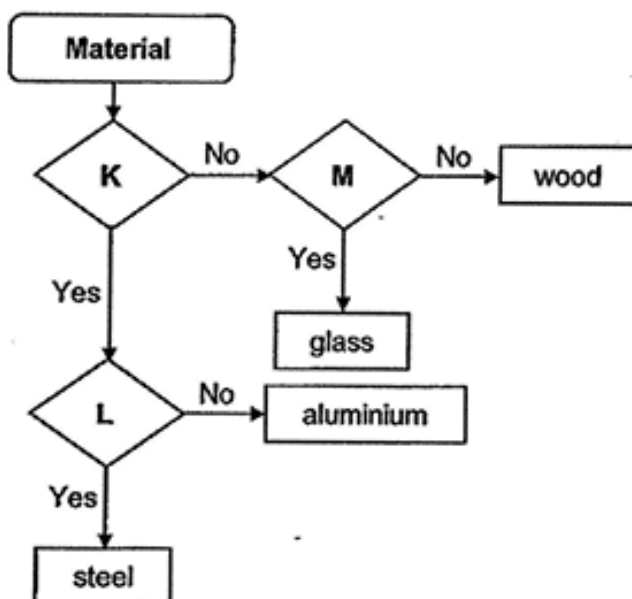
- A. G is the coldest object.
 - B. E is colder than F and G.
 - C. G and H have the same temperature.
 - D. F is hotter than G but colder than E.
- (1) B only
 (2) A and D only
 (3) B and C only
 (4) A, C and D only
27. Two uncooked eggs were placed in identical containers, as shown in the diagram below. Different amounts of water at 90°C were then poured into the containers. The eggs were left in the containers for 10 minutes.



Which of the following is correct at the end of ten minutes?

	Observation	Explanation
(1)	Both eggs were equally cooked.	The water in both set-ups had the same amount of heat to cook the eggs.
(2)	Both eggs were equally cooked.	The water in both set-ups had the same temperature to cook the eggs.
(3)	The egg in Container A was less cooked than the egg in Container B.	The temperature in Container A was spread throughout more water so there was less heat in it.
(4)	The egg in Container B was less cooked than the egg in Container A.	The water in Container B had less heat than the water in Container A to cook the egg.

28. The flowchart shown below is used to classify some materials.



What are questions K, L and M?

	K	L	M
(1)	Is it magnetic?	Is it strong?	Is it waterproof?
(2)	Is it an electrical conductor?	Is it magnetic?	Does it allow light to pass through?
(3)	Is it magnetic?	Is it an electrical conductor?	Does it allow light to pass through?
(4)	Is it an electrical insulator?	Is it strong?	Is it waterproof?

END OF BOOKLET A

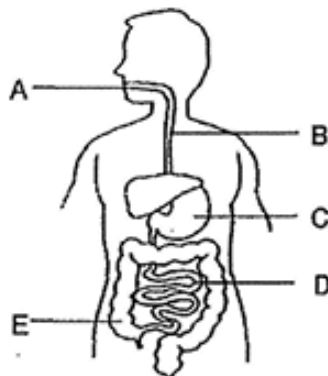
GO ON TO BOOKLET B

BOOKLET B : [44 marks]

For questions 29 to 40, write your answers in this booklet.

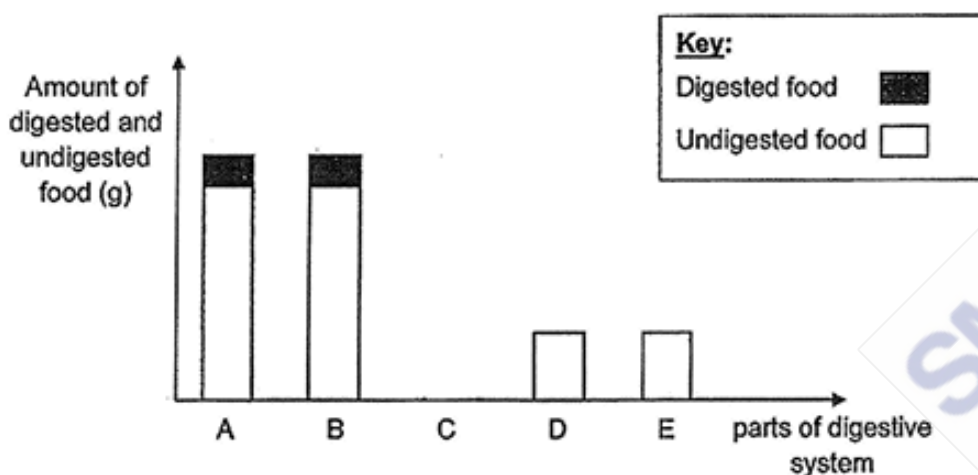
The number of marks available is shown in the brackets [] at the end of each question or part-question.

29. Food samples are taken from parts A, B, C, D and E of the human digestive system.



- (a) Based on the diagram above, which of the part(s) A, B, C, D or E produce(s) digestive juices? [1]

- (b) The amount of digested and undigested food at the end of parts A, B, C, D and E is shown in the graph below.
Draw in the graph below to show the amount of digested and undigested food at the end of part C. [1]

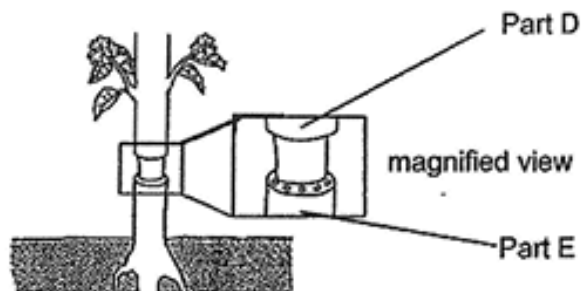


- (c) The amount of food at the end of part D is the same as part E. Give one reason why this is so. [1]

- (d) Explain how the digestive system and the circulatory system work together to allow digested food to reach the rest of the body. [1]



30. Sam removed an outer ring from the stem of a plant as shown below. The food-carrying tubes were removed while the water-carrying tubes remained in the stem.

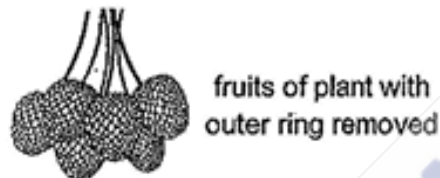
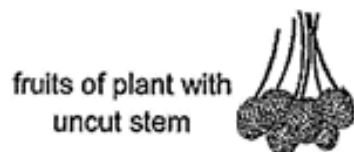


After some time, he measured and recorded the thickness of the stem at parts D and E in the table below.

Part	Thickness of stem (cm)		
	Day 1	Day 4	Day 7
D	16	18	20
E	16	16	16

- (a) Explain the change in thickness of part D. [2]

- (b) Sam observed that the plant with outer ring of the stem removed produced larger fruits compared to other plants.



Explain Sam's observation.

[2]

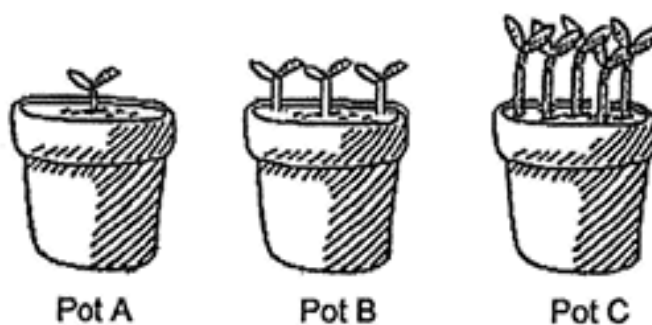
31. Four similar balsam fruits, A, B, C and D were placed under different temperature conditions to find out the effect of temperature on the splitting of the balsam fruits. The results were then recorded in the table as shown below.

	Balsam fruit			
	A	B	C	D
Surrounding temperature (°C)	15	20	25	35
Time taken for fruit to split (hours)	did not split	after 24 hours	after 15 hours	after 3 hours
Distance of seeds scattered from the parent plant (m)	0	2	3	5

- (a) Which fruit, A, B, C or D split with the greatest force? Give a reason for your answer. [1]

- (b) From the above results, explain the relationship between the surrounding temperature and the time taken for the fruit to split. [1]

32. Roy carried out an experiment to find out how the number of seeds in a pot of soil would affect the height of the seedlings. He filled three identical pots A, B and C with equal amount of soil. He then placed different number of seeds into each pot. The pots were placed at the same location and given an equal amount of water daily. The diagram below shows the height of seedlings after a week.

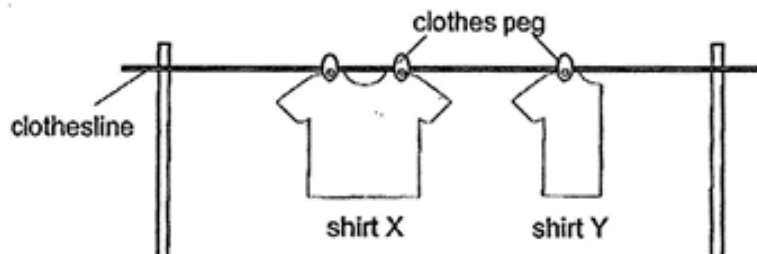


- (a) State all the condition(s) needed for germination to take place. [1]

- (b) Explain why the seedlings in Pot C are taller and thinner than those in Pot A. [2]

- (c) Give a reason how placing all three pots at the same location and giving the seedlings the same amount of water would ensure that the experiment was a fair test. [1]

33. John washed two shirts of the same material, shape and size and hung them on a clothesline under the sun to dry as shown below. Shirt X was left unfolded while shirt Y was folded into half.



He recorded the mass of shirts X and Y in the table below.

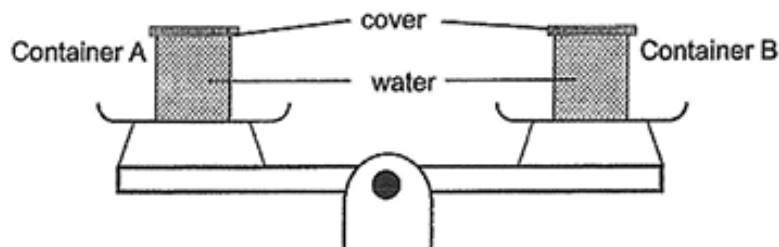
Time (min)	Mass of shirt X (g)	Mass of shirt Y (g)
0	800	800
30	650	700
60	320	450
90	300	380
120	300	350

- (a) What is the mass of the shirt when it is dried? [1]

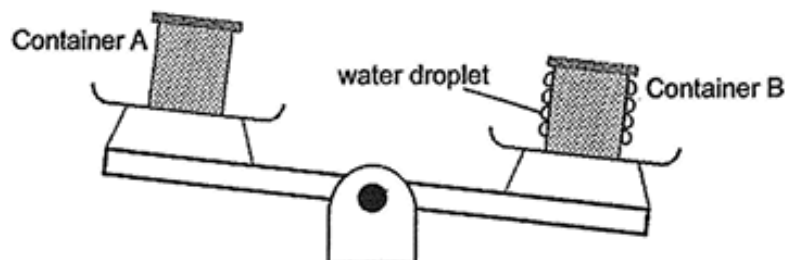
- (b) Based on the results, explain why shirt X dried faster. [2]

- (c) John wants to find out what is the relationship between the amount of heat and the time taken for the shirts to dry.
What should he do to Shirt X to make the experiment a fair test? [1]

34. Betty had two identical containers, A and B. She filled one container with hot water and the other container with cold water. She covered both containers to make sure no water could escape and placed them on a pan balance.



After a while, she observed that water droplets were formed on the outside of the container B and the pan balance tilted down towards it.



- (a) Which container contained hot or cold water? [1]

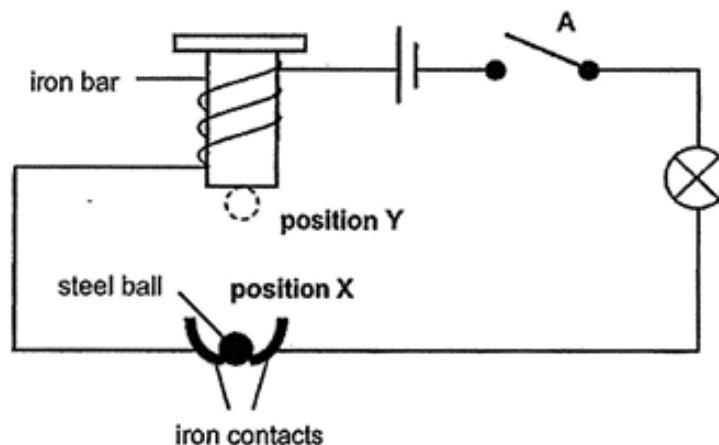
(i) Container A: _____

(ii) Container B: _____

- (b) Explain why water droplets were formed on the outside of container B. [1]

- (c) When Betty removed the covers from both containers, she observed that the pan balance tilted down even more towards container B after some time. There was no spillage of water from both containers. Explain her observation. [1]

35. Elaine carried out an experiment as shown in the diagram below.

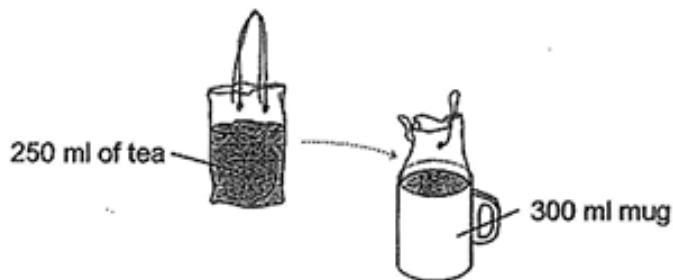


- (a) When she closed switch A and the steel ball was at position X, the light bulb lit up. Explain why the bulb lit up. [2]

- (b) When the bulb lit up, she also observed that the steel ball went up to position Y. After the steel ball went up to Y, the bulb did not light up. Explain her observation. [2]

- (c) She replaced the iron bar with another bar Q made of a different material. When she closed the switch, the steel ball did not move to position Y. Explain her observation. [1]

36. Kelly placed a packet of tea into a mug as shown below.

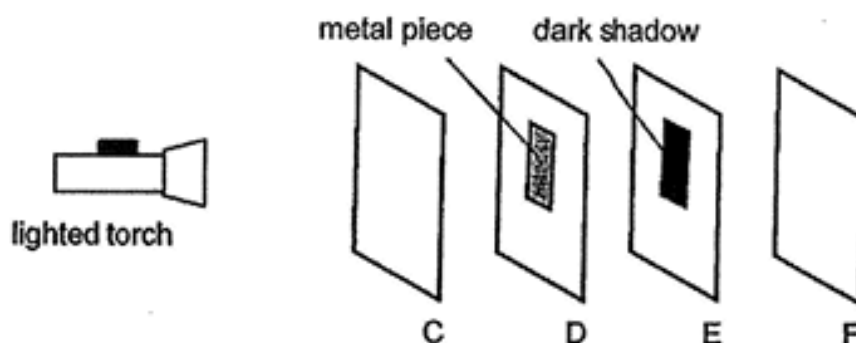


- (a) State a property of the tea that allowed Kelly to place it into the mug. [1]

- (b) Did the volume of the tea change after it was placed into the mug? Give a reason for your answer. [1]

- (c) Kelly wants to confirm the volume of the mug. Using a 500ml measuring cylinder and water, describe how she can confirm the volume of the mug. [2]

37. (a) Four sheets, C, D, E and F, made of different materials are arranged in a straight line in a dark room, as shown below. Sheet D has a metal piece pasted on it.

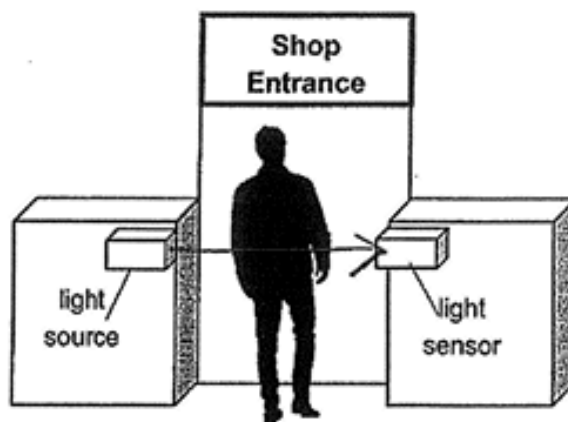


When the torch is switched on, a dark shadow is formed on sheet E.

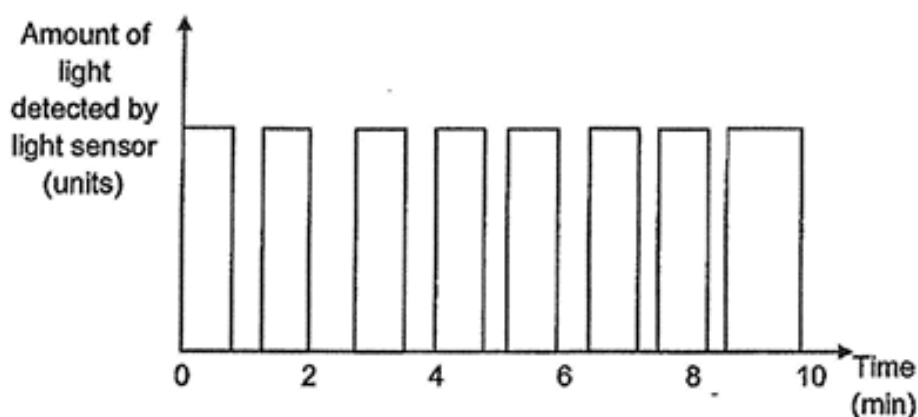
Based on the observations stated, put a tick (✓) in the boxes to show if each of the following statements is true, false, or not possible to tell. [1]

	Statement	True	False	Not possible to tell
(i)	Sheets C and D allow light to pass through.			
(ii)	If the metal piece is pasted on sheet E instead of D, a dark shadow will be formed on Sheet F.			

- (b) A shopkeeper uses the set-up shown below to count the number of customers entering the shop.



The data collected over a period of 10 minutes is shown in the graph below.

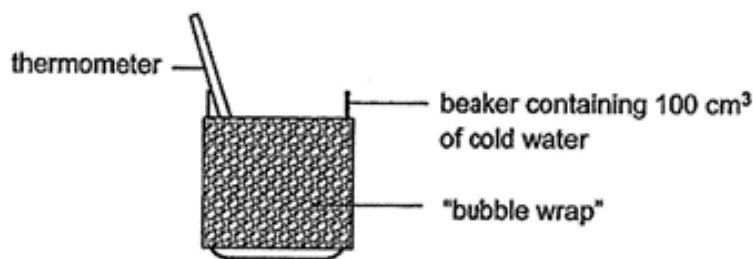


- (i) State one property of light which the above set-up demonstrates. [1]

- (ii) The set-up can only detect one person entering the shop at a time. Based on the graph, how many customers entered the shop during the 10 minutes? [1]

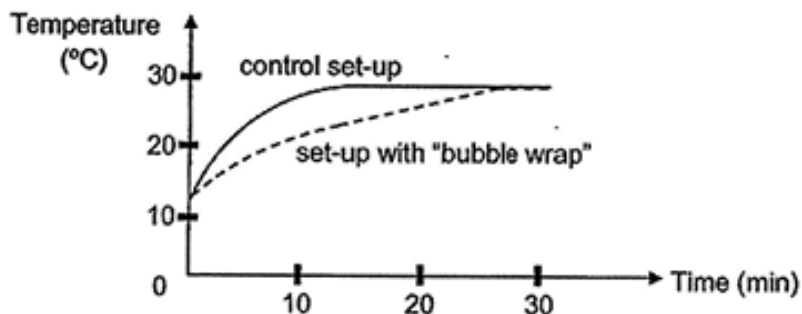
38. A group of students wanted to investigate how 'bubble wrap' would affect the amount of heat gained by cold water. 'Bubble wrap' is a material that contains pockets of air.

The diagram below shows the set-up which the students prepared. The "bubble wrap" was rolled tightly around the beaker.



- (a) To carry out their investigation, the students needed to have a control set-up. State the difference between the control set-up and the set-up with "bubble wrap" as shown above. [1]

- (b) The students recorded the temperature readings of both set-ups over time. The results are shown in the graph below.

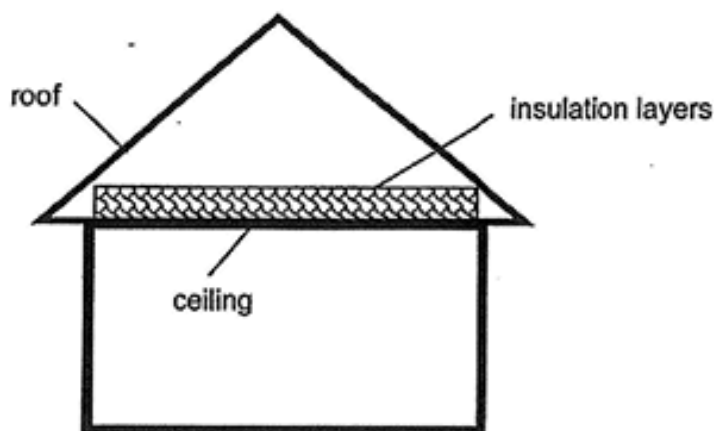


Explain how the "bubble wrap" affected the amount of heat gained by the cold water. [2]

- (c) The students replaced the water in both set-ups with 100 cm³ of water at 100°C.

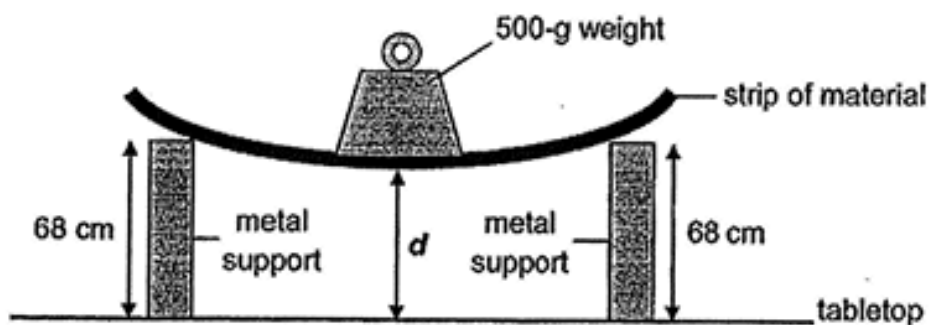
Would the water in the control set-up be warmer or colder than the water in the set-up with "bubble wrap" after 30 minutes? Explain your answer. [1]

- (d) Houses in countries which experience both extremely cold and hot weathers during the year usually have insulation layers installed between the roof and the ceiling. The insulation layers contain air pockets.



Explain how these insulation layers help the people living in the house during the extremely hot weather. [1]

39. A group of students set up an experiment, as shown in the diagram below, to compare a property of four strips of different materials, W, X, Y and Z.



For each strip of material, they measured the distance ' d ' when a 500-g weight was placed on the strip.

The results of the experiment are shown in the table below.

Material	d (cm)
W	60
X	48
Y	68
Z	54

- (a) Based on the results, what property of the materials were the students trying to find out? [1]

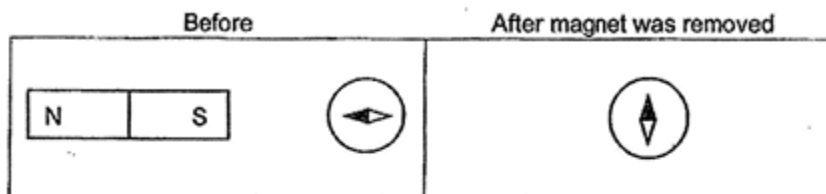
- (b) Name two other variables that must be kept constant to ensure a fair test. [1]

- (c) The students wanted to choose a material to make a 'selfie' stick to hold a phone camera to take photographs.



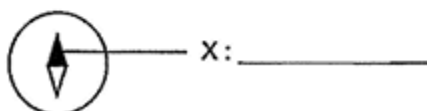
Based on the results of the experiment, which material, W, X, Y or Z, is most suitable for making the 'selfie' stick? Explain your answer. [2]

40. Jen placed a bar magnet near a compass on a table as shown below.



- (a) After Jen removed the magnet, she observed that the compass needle pointed in a different direction. Explain her observation. [1]

- (b) Identify the pole indicated by X on the compass. [1]

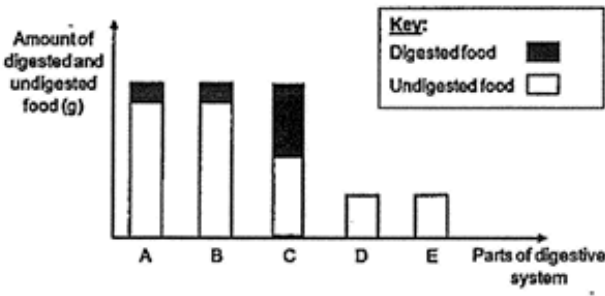


ANSWER SHEET

BOOKLET A: 56 marks

1. 2	6. 2	11. 2	16. 1	21. 2	26. 2
2. 1	7. 4	12. 3	17. 2	22. 3	27. 4
3. 3	8. 2	13. 2	18. 4	23. 4	28. 2
4. 2	9. 4	14. 2	19. 2	24. 3	
5. 2	10. 3	15. 4	20. 4	25. 4	

BOOKLET B: 44 marks

Qn		Answers (Full marks)
29	a	Parts A, C and D
	b	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <p>Amount of digested and undigested food (g)</p>  </div> <div> <p>Note:</p> <ul style="list-style-type: none"> The total amount of digested and undigested food is the same as that of A and B. The amount of digested food is more than that of A and B. The amount of undigested food is less than that of A and B but greater than that of D and E. </div> </div>
	c	<ul style="list-style-type: none"> The large intestine only absorbs water Or The large intestine does not absorb (undigested) food.
	d	<p>Digested food enters the blood through the small intestine.</p> <p>The blood transports the digested food to all parts of the body.</p>

Qn		Answers (Full marks)
30	a	Part D will increase in size as food made by the leaves cannot be transported to the roots or part E. So the food is stored at D.
	b	Food made by the leaves cannot be transported to the parts below D or to the roots. More/Excess food transported and stored in the fruits
31	a	D, the seeds are scattered <u>furthest</u> from the parent plant.
	b	The higher the surrounding temperature, the faster the time taken for the fruit to split as the pod will dry up faster .
32	a	Air/Oxygen, Warmth/Suitable temperature, Water
	b	<u>Cause:</u> Seedlings in pot C has less space to grow/are overcrowded but Seedlings in A has enough space to grow. (show comparison between A and C) AND <u>Effect:</u> As a result, seedlings in C grew taller to <u>receive more sunlight</u> .
	c	This ensures that the difference in height of the seedlings is only due to the different number of seeds in each pot. Or This ensures that the amount of water or the location will not affect the change in height of the seedlings.
33	a	300g
	b	Shirt X has a <u>larger exposed surface area</u> . Water in shirt X <u>evaporated faster</u> (into water vapour).
	c	Fold shirt X into half. Place the shirts separately in locations with different temperature .
34	a	(i) Container A: Hot water (ii) Container B: Cold water
	b	Water vapour from the surrounding lost heat and condense to form water droplets.
	c	The water in container A evaporated faster than container B as the temperature of the water in A is higher.

Qn		Answers (Full marks)															
35	a	<p>The steel ball is an <u>electrical conductor</u>.</p> <p>At position A, the steel ball formed a <u>closed circuit</u> causing the bulb to light up.</p>															
	b	<p>The iron bar became <u>an electromagnet</u> and attracted the steel ball</p> <p>This caused the circuit to become open.</p>															
	c	<p>Bar Q is made of non-magnetic material.</p> <p>So it will not be an electromagnet to attract the steel ball.</p>															
36	a	Tea has no definite shape															
	b	No. Tea / liquids have definite volume.															
	c	<p>Fill the mug to the brim with water and transfer the water to the measuring cylinder. Measure the volume of water in the measuring cylinder.</p> <p>OR</p> <p>Measure 300 ml of water using the measuring cylinder and pour it into the mug.</p> <p>If the water did not overflow the mug is 300 ml</p>															
37	a	<table><tr><th></th><th>Statement</th><th>True</th><th>False</th><th>Not possible to tell</th></tr><tr><td>(i)</td><td>Sheets C and D allow light to pass through.</td><td>✓</td><td></td><td></td></tr><tr><td>(ii)</td><td>If the metal piece is pasted on sheet E instead of D, a dark shadow will be formed on Sheet F.</td><td>✓</td><td>✓</td><td>✓</td></tr></table>		Statement	True	False	Not possible to tell	(i)	Sheets C and D allow light to pass through.	✓			(ii)	If the metal piece is pasted on sheet E instead of D, a dark shadow will be formed on Sheet F.	✓	✓	✓
		Statement	True	False	Not possible to tell												
	(i)	Sheets C and D allow light to pass through.	✓														
(ii)	If the metal piece is pasted on sheet E instead of D, a dark shadow will be formed on Sheet F.	✓	✓	✓													
	b	<p>(i) Light travels in a straight line.</p> <p>OR</p> <p>Light can be blocked by an object.</p>															
	(ii)	7 people															
38	a	The control set-up did not have the "bubble wrap" but the other set-up had.															
	b	<p>(i) The air in the bubble wrap is a poor conductor of heat</p> <p>and slowed down / reduced the gain of heat by the cold water from the surroundings.</p>															

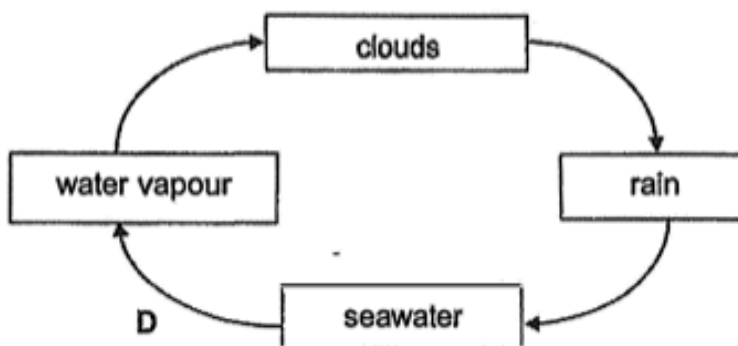
Qn		Answers (Full marks)
	(c)	<p>The water in control set-up would be colder.</p> <p>The water lost heat faster to the surrounding.</p>
	(d)	<p>The insulation layers slow down the heat gain in the house from the (hot) surroundings.</p> <p>So it is cooler in the house than outside the house.</p>
39	a	<p>Flexibility OR</p> <p>The ability of the materials to bend without breaking.</p>
	b	<p>[Any two of the following]</p> <ul style="list-style-type: none"> Distance between the two (metal) supports. Thickness / length of the strips. (same point) Position where the 500-g weight was placed. The number of weights
	c	<p>[Claim] Material Y.</p> <p>[Evidence] When the 500-g weight was placed on it, it did not bend / d is the highest.</p> <p>[Reasoning] The material is stiffest and can hold the phone camera up so that it does not wobble or shake to take photographs.</p>
40	a	<p>When the magnet is removed, the compass needle will come to rest in the <u>north-south direction</u>. [1]</p>
	b	<p>North</p>

MAHA BODHI SCHOOL WA1 PAPER

Section A : [8 x 2 marks = 16 marks]

For each question from 1 to 8, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). Write your answer in the bracket.

1. The diagram below shows the water cycle.



What is process D and the heat change occurring during the process?

	Process D	Heat change
(1)	condensation	gains heat
(2)	condensation	loses heat
(3)	evaporation	gains heat
(4)	evaporation	loses heat

()

2. The following pupils made some statements about fruit and seed dispersal.

Amy : Seeds in fleshy fruits are dispersed by animals.

Ben : Fruits and seeds dispersed by wind have fibrous husks.

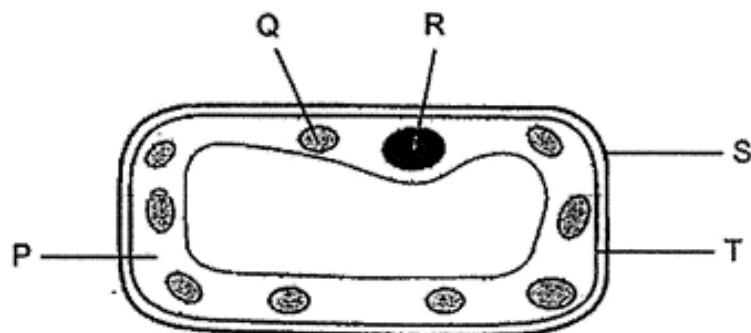
Carl : Plants disperse their fruits and seeds to reduce overcrowding.

Which of the following pupils made the correct statement?

- (1) Amy and Ben only
- (2) Amy and Carl only
- (3) Ben and Carl only
- (4) Amy, Ben and Carl

()

3. The diagram below shows a plant cell.

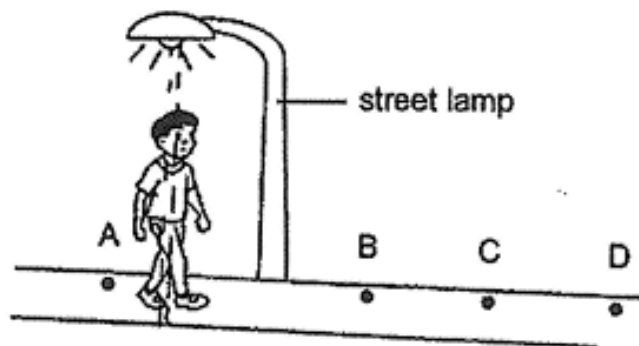


Which of the parts, P, Q, R, S or T, can also be found in animal cells?

- (1) P, Q and S only
- (2) P, R and T only
- (3) Q, R and T only
- (4) Q, S and T only

()

4. Gareth was walking along a street from point A to point D as shown below.




If the street lamp is the only source of light, at which point would his shadow be the shortest?

- (1) A
- (2) B
- (3) C
- (4) D

()

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5. Mary conducted an experiment to find the melting and boiling points of Substance X. She recorded her results in the table below but spilled ink on the paper. The melting point could not be seen clearly.

Melting point ($^{\circ}\text{C}$)	Boiling point ($^{\circ}\text{C}$)
	75

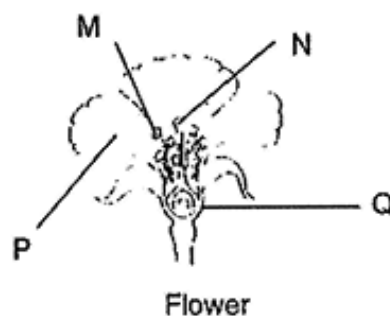
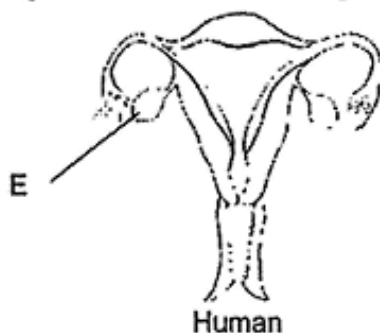
Based on her observation, she noticed that Substance X is a solid at 30°C .

Which of the following correctly describes the states of Substance X at 25°C and 80°C ?

	State of substance X at 25°C	State of substance X at 80°C
(1)	solid	gas
(2)	solid	liquid
(3)	liquid	liquid
(4)	liquid	solid

()

6. The diagrams below show the reproductive parts of a human and a flower.

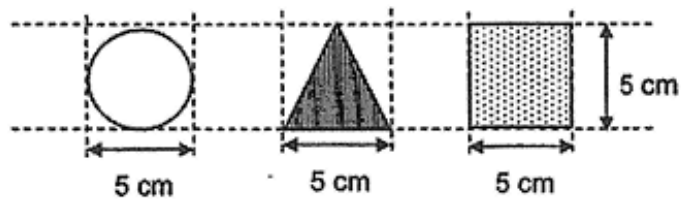


Which part of the flower, M, N, P or Q, has a similar function as part E in human?

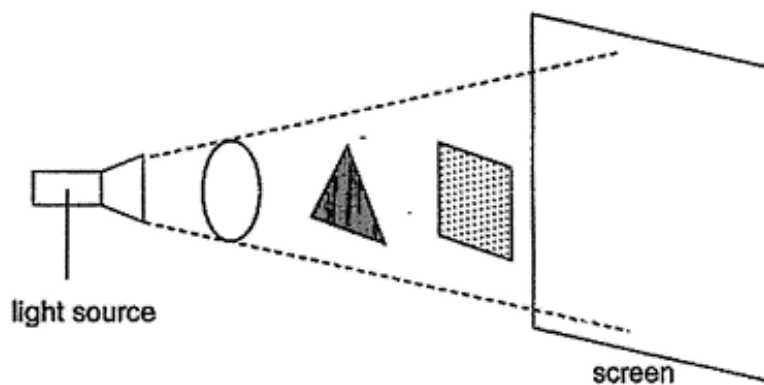
- (1) M
 (2) N
 (3) P
 (4) Q

()





7. Jane has three shapes made of the same material. The height and width of each shape is 5 cm.



She conducted an experiment in a dark room using the following set-up below, and the shadow is formed on the screen.

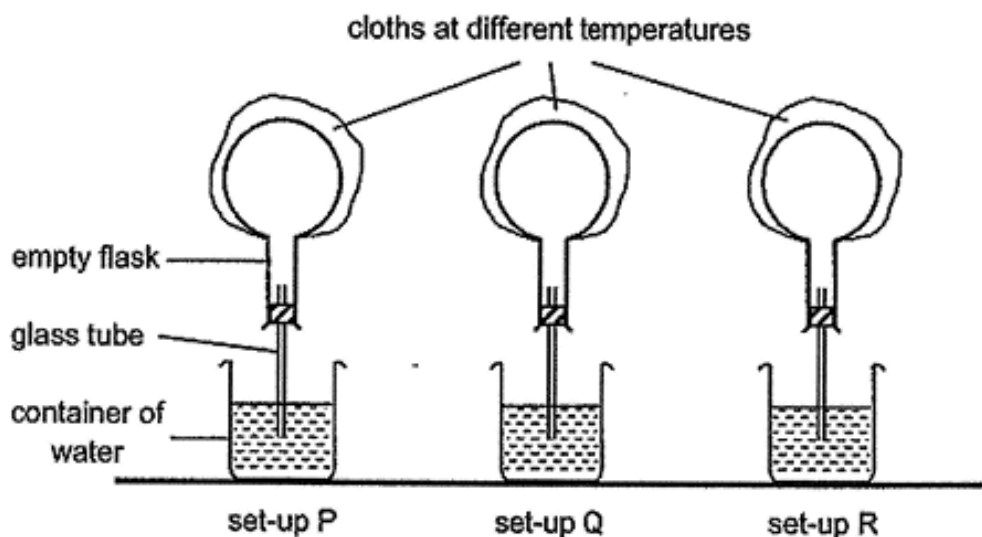


Based on the information above, which one of the shadows will be formed on the screen?

- (1) 
- (2) 
- (3) 
- (4) 

()

8. Mary carried out an experiment in the Science Room using the set-ups P, Q and R as shown below. The room temperature was 28 °C.



Mary made the following observations after the cloths were placed on the flasks in the three set-ups.

set-up P	No change was observed.
set-up Q	Bubbles escaped into the water from the glass tube.
set-up R	Water rose up the glass tube.

Which of the following shows the temperature of the cloths placed on the flasks in the three set-ups?

Temperature of cloths (°C)			
	set-up P	set-up Q	set-up R
(1)	28	5	80
(2)	80	28	5
(3)	28	80	5
(4)	5	80	28

()

SECTION B : [14 marks]

For questions 9 to 12, write your answers in this booklet.

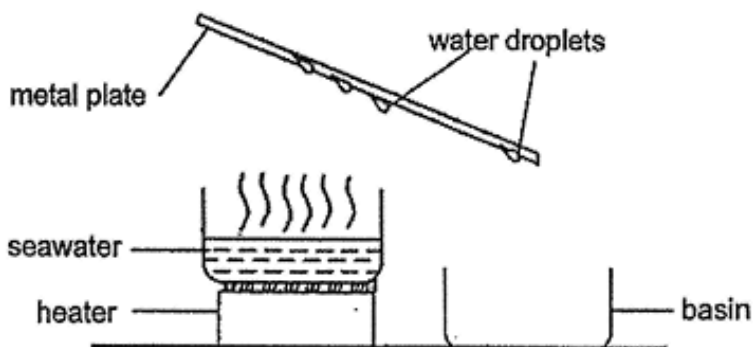
The number of marks available is shown in the brackets [] at the end of each question or part-question.

9. (a) State a similarity and a difference between boiling and evaporation. [2]

(i) Similarity:

(ii) Difference:

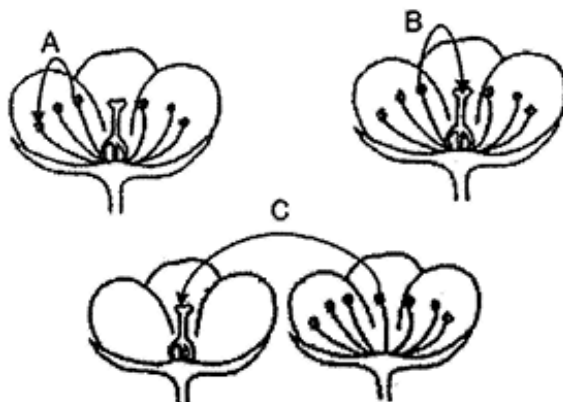
- (b) Maya prepared a set-up to obtain water from seawater as shown below.



Describe how water is collected in the basin.

[2]

10. Study the diagrams below. The arrows A, B and C represent the transfer of pollen grains.



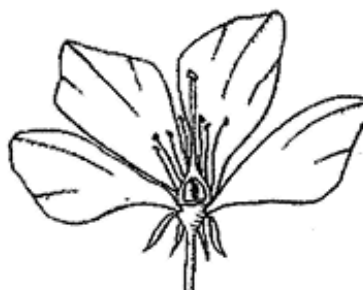
- (a) Which of the above arrows show pollination taking place?
Explain your answer.

[1]

- (b) The diagrams below show two different flowers X and Y.



Flower X



Flower Y

How are flower X and flower Y pollinated? Give a reason for each of your answers.

[2]

- (i) Flower X:

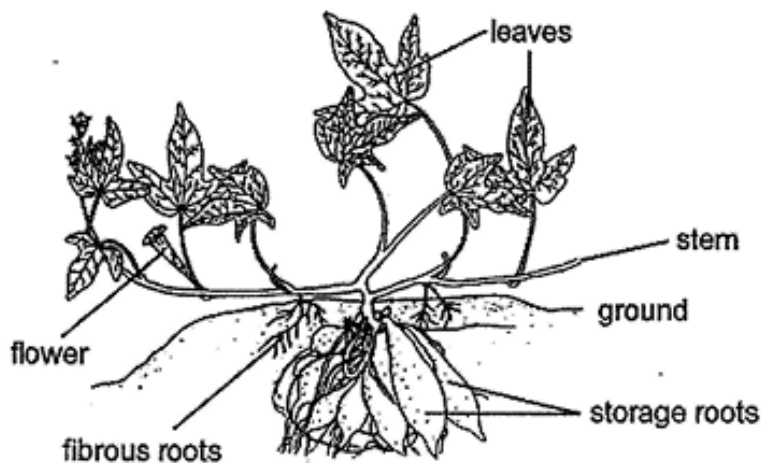
- (ii) Flower Y:

11. The table below provides some information about three different cells, X, Y and Z. A tick (✓) indicates the presence of the cell part.

cell parts	cell X	cell Y	cell Z
cell wall	✓	✓	X
nucleus	✓	✓	X
chloroplasts	X	✓	X
cell membrane	✓	✓	✓

- (a) Which of the cells, X, Y or Z, cannot reproduce? Explain your answer. [1]

- (b) The diagram shows a plant.



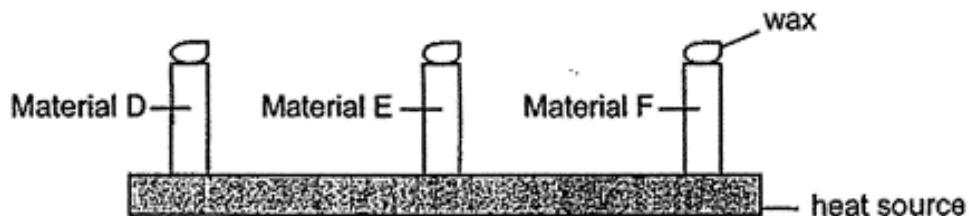
- (i) For each of the following cells X and Y, state one plant part based on the above diagram where the cell can be found. [2]

Cell X : _____

Cell Y : _____

- (ii) Explain your answer in (i) for cell Y. [1]

12. In an experiment, some wax was placed on the top of three rods made of different materials, D, E and F. The three rods were then placed on the top surface of a heat source as shown below.



The time taken for the wax on the three materials to melt completely is shown below.

Material	D	E	F
Time taken (min)	5	9	2

- (a) Explain how the wax on the three rods melted. [1]

- (b) A group of students want to make a container for keeping hot drinks.

Which of the materials, D, E or F, is most suitable for making such a container so that the hot drinks can stay hot for the longest period of time? Explain your answer. [2]

ANSWER SHEET

SECTION A

Q 1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
3	2	2	1	1	4	1	3

SECTION B

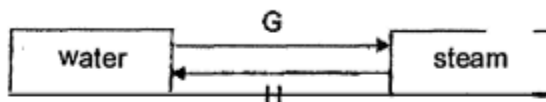
Q9)	<p>a) i) Bailing changes the substance from liquid to gas / Both require heat gain.</p> <p>ii) Bailing occurs at a fixed temperature but evaporation does not.</p> <p>b) Water in the seawater gained heat from the heater and evaporated into water vapour. The water vapour came into contact with the metal plate, lost heat and condensed into water droplets.</p>
Q10)	<p>a) Band C. The pollen grain was transferred to the stigma.</p> <p>b) i) Wind. The stigma is hanging out</p> <p>ii) Animal. The petals are large.</p>
Q11)	<p>a) Z. It does not have a nucleus which contains genetic information.</p> <p>b) i) Cell X: roots Cell Y: leaves</p> <p>ii) Cell Y has chloroplasts to trap sunlight and make food.</p>
Q12)	<p>a) Heat from the heat source flowed through the rod to the wax.</p> <p>b) E. The wax melted the slowest. Material E is the poorest conductor of heat. Heat from the hot drink will be lost to surrounding the slowest.</p>

MAHA BODHI SCHOOL WA2 PAPER

SECTION A : [8 x 2 marks = 16 marks]

For each question from 1 to 8, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). **write your answer in the bracket.**

1. The diagram below shows how water changes after processes G and H have taken place.



Which of the following correctly represents G and H?

	G	H
(1)	freezing	evaporation
(2)	evaporation	freezing
(3)	boiling	condensation
(4)	condensation	boiling

()

2. Which of the following statement(s) below explain(s) why we can see the moon?

- A. It gives off light.
- B. It reflects the light from the Sun to our eyes.
- C. It reflects the light from the Earth to our eyes.

- (1) A only
- (2) B only
- (3) C only
- (4) A, B and C

()

3. Ali held onto a glass of cold water. Shortly, his hand felt cold.



Which of the following best explains why Ali's hand felt cold?

- (1) Heat flowed from the glass to his hand.
- (2) Heat flowed from his hand to the glass.
- (3) Coldness flowed from the glass to his hand.
- (4) Coldness flowed from his hand to the glass.

()

4. Beatrice prepared four set-ups of liquids in a room. The experimental conditions are shown in the table below.

Set-up	Type of liquid	Temperature of liquid (°C)	Volume of liquid (cm ³)
J	X	40	50
K	X	80	50
L	Y	40	50
M	Y	40	100

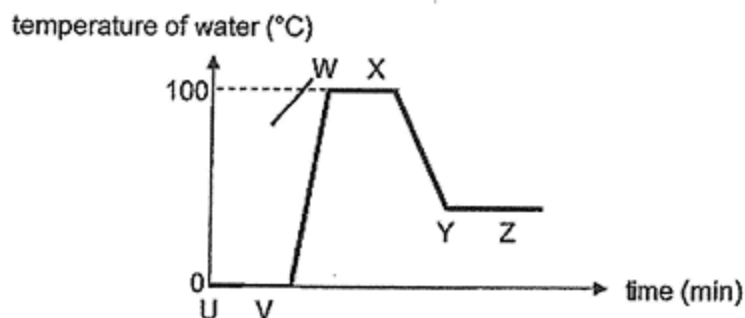
She wanted to confirm if rate of evaporation is affected by the type of liquid.

Which pair of set-ups should Beatrice compare for her investigation?

- (1) J and L
- (2) J and M
- (3) K and L
- (4) K and M

()

5. A container of frozen water was heated till boiling occurred and left to cool after. The graph below shows how the temperature of water changed over time.



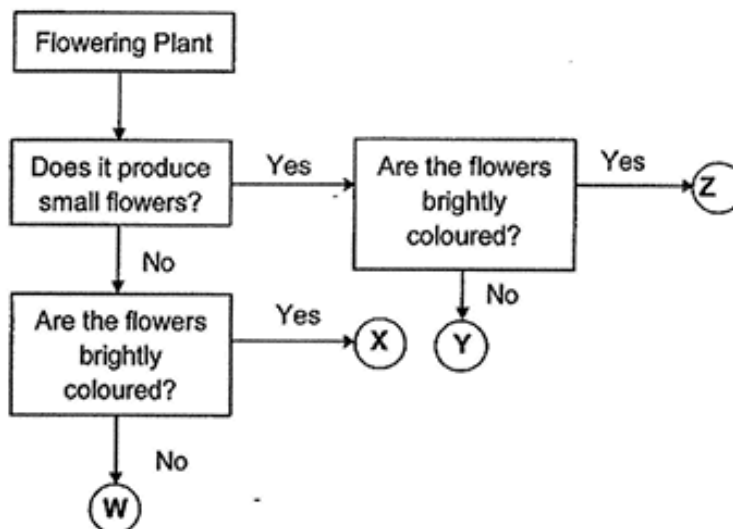
Which of the following statement(s) is/are correct?

- A. No heat was gained by the water during UV.
- B. There was only one state of water present during VW.
- C. The temperature during WX was the boiling point of water.
- D. The temperature during YZ was the freezing point of water.

- (1) C only
- (2) A and C only
- (3) B and C only
- (4) B and D only

()

6. The flowchart below shows the characteristics of some flowering plants in Sam's garden.



Sam observed that some insects were attracted to small and brightly coloured flowers. Which group of flowers were the insects attracted to?

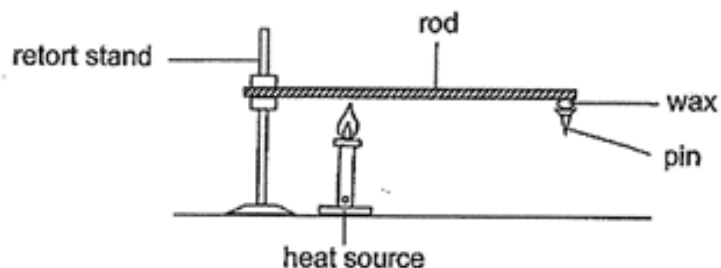
- (1) W
 (2) X
 (3) Y
 (4) Z
- ()
7. Hendrick carried out an experiment using two fruits, A and B. He released each fruit, one at a time, from a height of 10m from the ground. He measured the time taken for each fruit to reach the ground.



Which set of readings is most likely to be correct?

	Time taken for fruit A (s)	Time taken for fruit B (s)
(1)	2.8	2.9
(2)	5.2	5.2
(3)	5.1	3.1
(4)	5.6	6.5

8. Cailli conducted an experiment as shown below to find out which material was the worst conductor of heat.



She repeated the experiment with rods made of different materials.

What should Cailli observe so that she could make a correct conclusion?

- (1) longest time taken for the pin to drop
- (2) shortest time to heat the rod to a fixed length
- (3) longest distance between the rod and the ground
- (4) shortest distance between the pin and the heat source

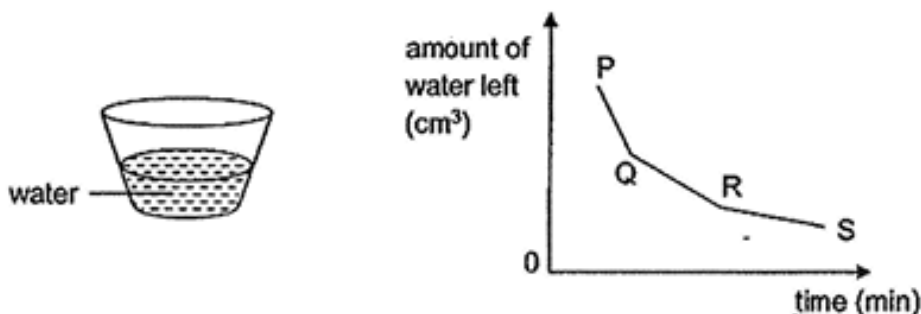
()

SECTION B : [14 marks]

For questions 9 to 12, write your answers in this booklet.

The number of marks available is shown in the brackets [] at the end of each question or part question.

9. Eugene conducted an experiment to find out how exposed surface area of water affected rate of evaporation. He poured some water into a container and recorded the amount of water left in the container over a period of time. The graph below shows his results.

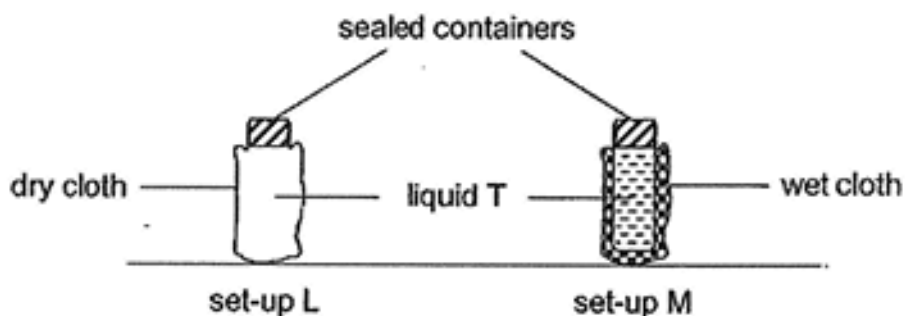


- (a) Based on the result, what was the relationship between time duration and the amount of water left? [1]

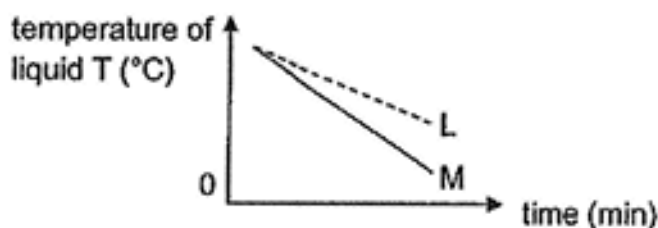
- (b) State how the exposed surface area of water changed over time. [1]

- (c) Explain why more water was lost during period PQ than during period RS. [1]

10. (a) Fandi conducted an experiment to find how temperature of liquid T would be affected by a wet cloth. His set-ups are shown in the diagram below.



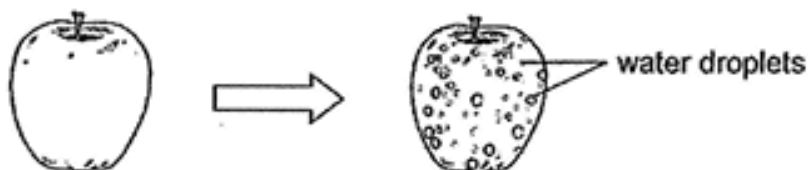
The graph below shows how the temperature of liquid T in set-ups L and M change over time.



- (i) Explain how the wet cloth became dry after some time. [1]

- (ii) Based on the results, what was the effect of the wet cloth, as compared to the dry cloth, on the temperature of liquid T? [1]

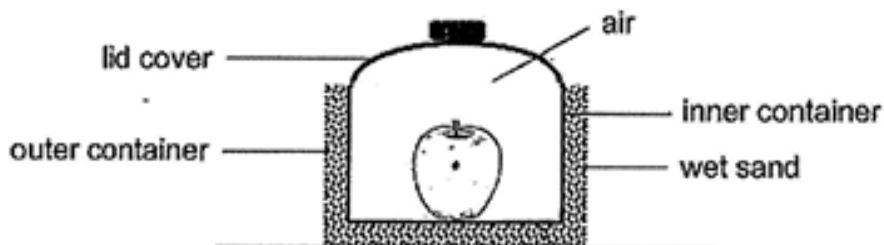
- (b) Fandi left a cold apple on his table. After some time, he observed water droplets on the apple.



Explain how water droplets were formed on the apple.

[1]

- (c) The diagram below shows a model that was built by Fandi to keep his apple cool.

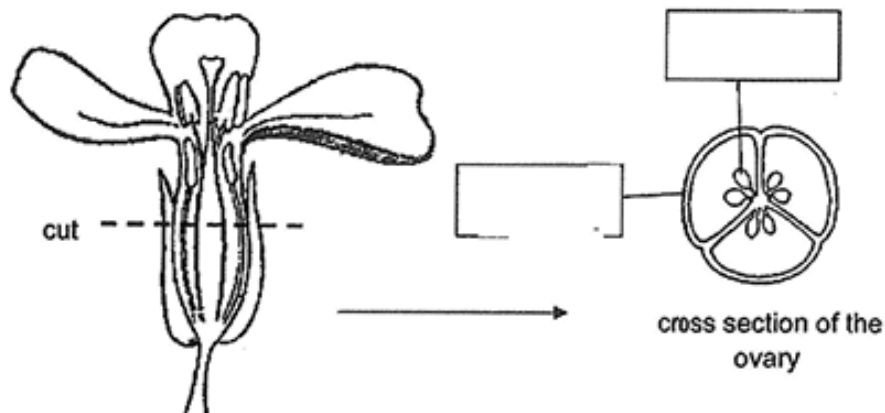


The air inside the inner container was kept cool by the wet sand.

- (i) Explain why no water droplets were formed on the surface of the cold apple after some time. [1]

- (ii) The outer container had many tiny holes. Fandi did not observe any water or sand flowing out from the outer container. Give a reason how the wet sand dried faster when the outer container had more tiny holes. [1]

11. Jess plucks a flower from her garden and cuts across the middle of its ovary. Its cross section is shown below.

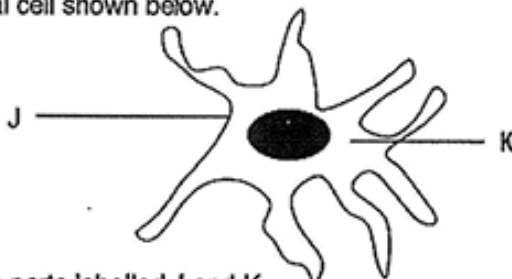


- (a) Label the ovary and the ovule in the boxes above. [1]
(b) What will the ovary and ovule develop into when the flower is pollinated and fertilised? [2]

Ovary : _____

Ovule : _____

12. Study the animal cell shown below.



- (a) Name the parts labelled J and K. [2]

J : _____ K : _____

- (b) Based on the diagram, explain why the cell shown above is an animal cell. [1]

Marks : / 3

~ END OF PAPER ~

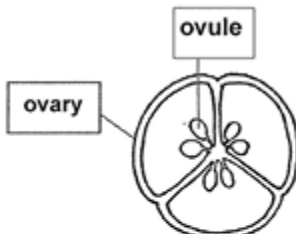
ANSWER SHEET

SECTION A

Q 1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
3	2	2	1	1	4	3	1

SECTION B

Q9)	<p>a) The longer the time, the lesser the water in the container.</p> <p>b) When the water evaporates, the water level goes down and the exposed surface area decreases as the side of the container is in a sloping position.</p> <p>c) The exposed surface area at PQ is longer than RS. The water had a faster rate of evaporation at PQ.</p>
Q10)	<p>a) i) Water in the wet cloth gained heat from surrounding and evaporated into water vapour.</p> <p>ii) The wet cloth helped to decrease the temperature of liquid T faster.</p> <p>b) Water vapour from the surroundings came into contact with the apple, lost heat and condensed into water droplets.</p> <p>c) i) Water vapour from the surroundings lose heat to the apple and condense.</p> <p>ii) The exposed surface was larger when there were holes as water could also evaporate from the sides and the top.</p>

Q11)	<p>a)</p> <div style="text-align: center;">  </div> <p>b) Ovary: fruit Ovule: seeds</p>
Q12)	<p>a) J: cell membrane K: cytoplasm</p> <p>b) The cell does not have a cell wall which all plant cells have.</p>

METHODIST GIRLS' SCHOOL EOY PAPER

For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). Shade the correct oval on the Optical Answer Sheet (OAS).

[56 marks]

- 1 Some animals are classified into three groups as shown below.

A	B	C
cat	duck	lizard
sheep	eagle	crocodile

They are grouped according to _____.

- (1) where they live
- (2) their movement
- (3) their outer body covering
- (4) their method of reproduction

- 2 Which of the following statements about the life cycles of a chicken and a grasshopper are correct?

- A Both life cycles have a nymph stage.
- B The young in both life cycles look like the adult.
- C Both animals go through their life cycles on land.
- D The young in both life cycles go through moulting.

- (1) A and B only
- (2) A and D only
- (3) B and C only
- (4) B, C and D only

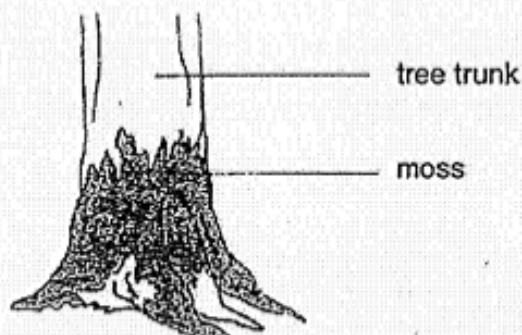
- 3 Divya observed some mosquitoes, butterflies and frogs living in her garden. The number of days needed for their eggs to hatch is shown below.

Characteristic	Mosquito	Butterfly	Frog
Number of days needed for eggs to hatch	2	3	5

On day 10, what would Divya most likely find in the pond of her garden?

- (1) frog eggs and caterpillars
- (2) mosquito larvae and tadpoles
- (3) frog eggs and mosquito larvae
- (4) mosquito larvae and caterpillars

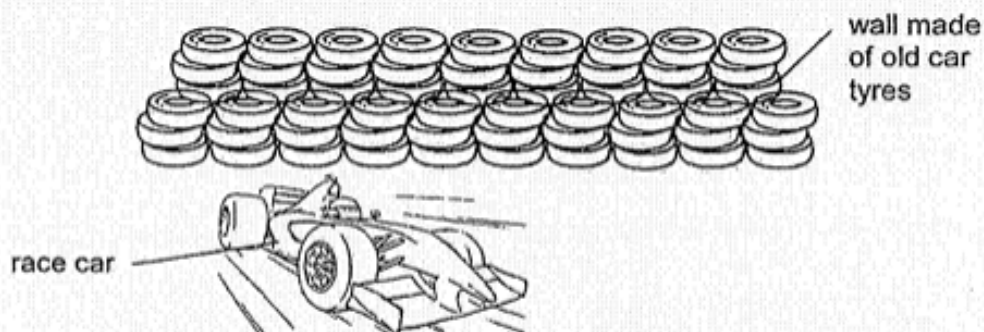
- 4 Moss is a tiny non-flowering plant. It grows well at the bottom of tree trunks in forests.



Suresh wants to grow moss in his garden. How can he help the moss grow well?

- (1) Water the moss daily.
- (2) Attract bees to his garden.
- (3) Grow the moss under bright sunlight.
- (4) Attract insects to help disperse fruits.

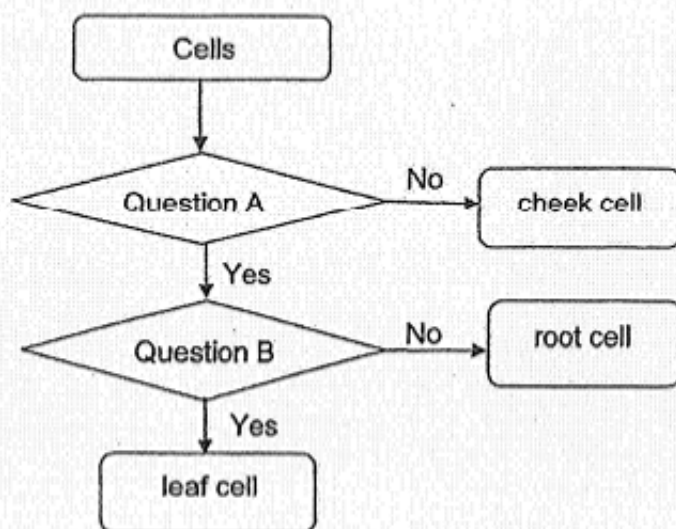
- 5 Old car tyres can be tied together and used to form a wall along racing tracks. This helps to protect racers and spectators when accidents happen.



Which properties of the material used to make the old car tyres help to ensure safety?

- (1) Strong and flexible.
- (2) Waterproof and weak.
- (3) Strong and able to float in water.
- (4) Waterproof and allows light to pass through.

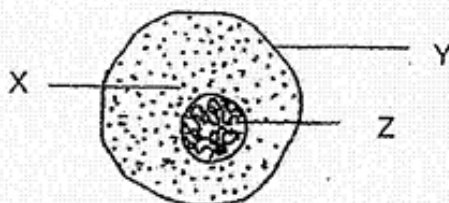
6 Study the flowchart below.



What are questions A and B?

	A	B
(1)	Does the cell have chloroplasts?	Does the cell have a cell wall?
(2)	Does the cell have a cell wall?	Does the cell have chloroplasts?
(3)	Does the cell have a nucleus?	Does the cell have a cell membrane?
(4)	Does the cell have a cell membrane?	Does the cell have a nucleus?

7 Study the cell as shown below.

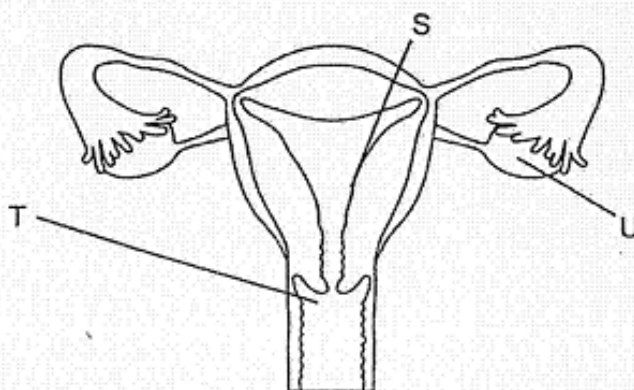


Which of the following statement(s) is/are true?

- A X is a jelly-like substance.
- B Y gives the cell its fixed shape.
- C Z contains genetic information of the cell.

- (1) A and B only
- (2) A and C only
- (3) B and C only
- (4) A, B and C

8 The diagram below shows a human reproductive system with parts labelled.

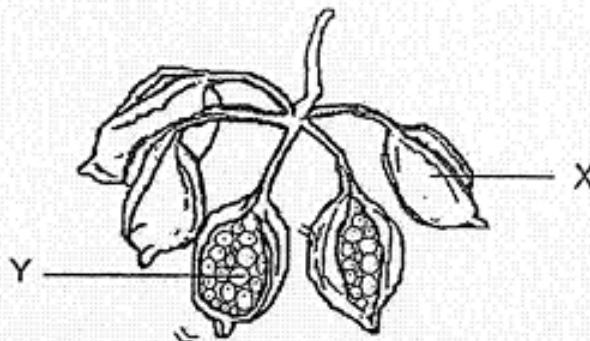


Which of the following statement(s) are true?

- A Ovules can be found in U.
- B T contains female reproductive cells.
- C S is where the fertilised egg attaches itself to grow.

- (1) A only
- (2) C only
- (3) A and B only
- (4) B and C only

- 9 The picture below shows two parts, X and Y, taken from a plant.

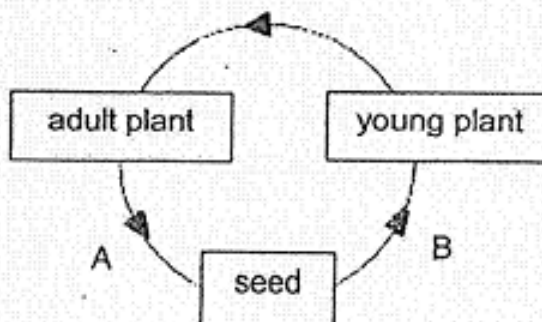


Which of the statement(s) is/are correct?

- A X helps to disperse Y.
- B Y is developed from an ovary.
- C X and Y are formed from flowers.

- (1) A only
- (2) B only
- (3) A and C only
- (4) B and C only

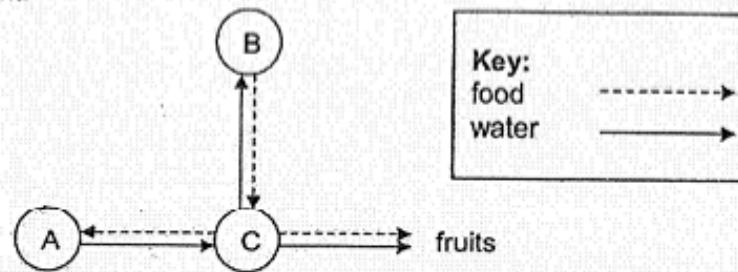
- 10 The diagram shows the life cycle of a flowering plant.



Which of the following correctly represent the processes, A and B?

	Process(es) at A	Process(es) at B
(1)	fertilisation	pollination
(2)	dispersal	pollination and fertilisation
(3)	pollination and fertilisation	dispersal and germination
(4)	pollination and germination	fertilisation and dispersal

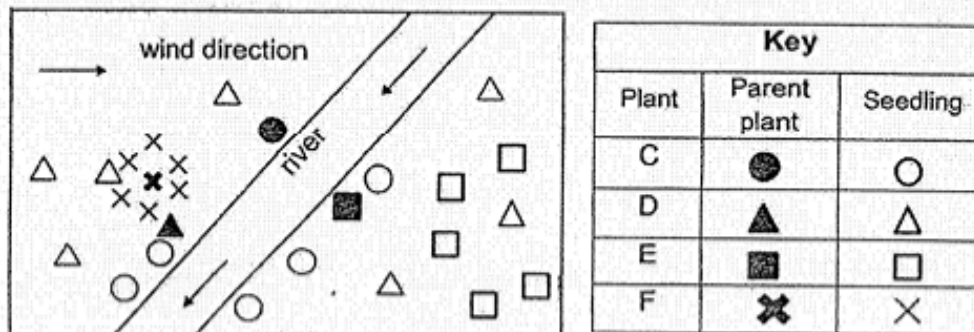
11. The diagram below shows how food and water are transported to different parts of a plant.



Which of the following best represent the parts of the plant, A, B and C?

	A	B	C
(1)	stem	leaves	roots
(2)	roots	leaves	stem
(3)	leaves	flowers	roots
(4)	flowers	stem	leaves

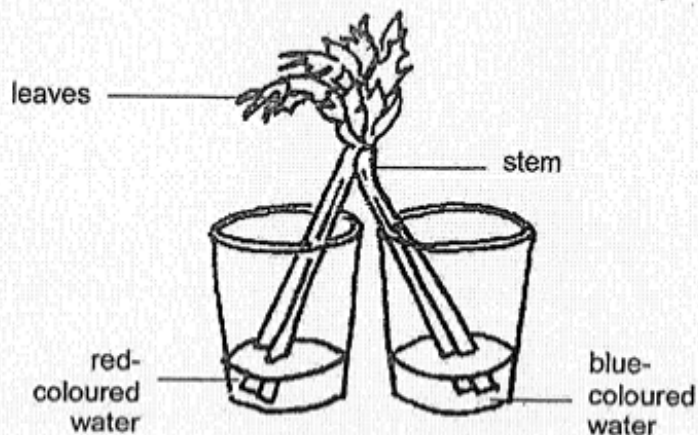
12. The diagram below shows the seed dispersal patterns of plants C, D, E and F.



Which of the following characteristics of the fruits correctly match to the seed dispersal method of plants C, D, E and F?

	Plant C	Plant D	Plant E	Plant F
(1)	pod-like structure	hook-like structure	wing-like structure	fibrous husk
(2)	fibrous husk	pod-like structure	hook like structure	wing-like structure
(3)	pod-like structure	wing-like structure	fibrous husk	hook-like structure
(4)	fibrous husk	hook-like structure	wing-like structure	pod-like structure

- 13 Joseph cut the stalk of a celery into two equal parts and placed them into two containers with equal amount of water but different coloured dye added.



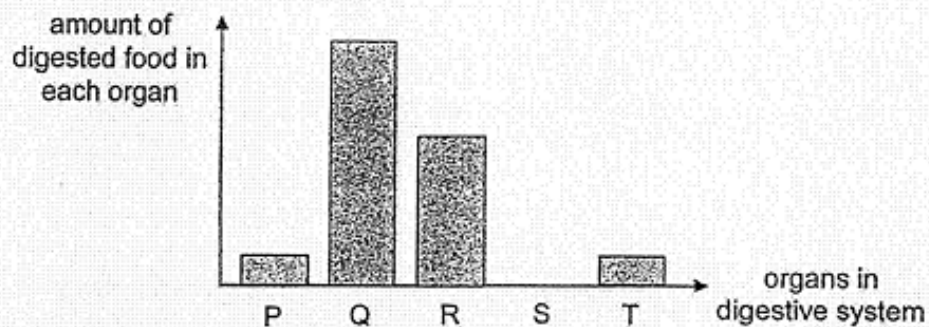
After a while, he observed that some parts of the celery stalk turned red, some turned blue, while the rest remained green.

What could Joseph conclude from his observations?

- A The food made by the plant was red and blue in colour.
- B The water-carrying tubes transported the different coloured water to the leaves.
- C There were no water-carrying tubes in the parts that remained green.

- (1) A only
- (2) B only
- (3) A and C only
- (4) A, B and C

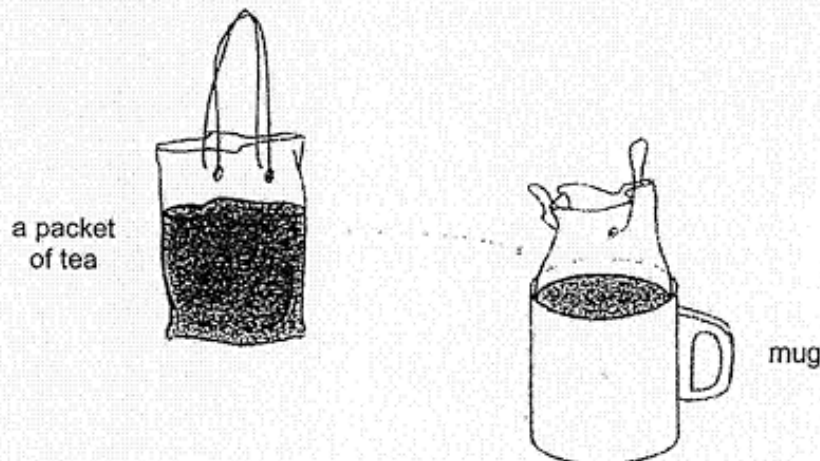
- 14 P, Q, R, S and T are organs in the digestive system. The graph below shows the amount of digested food in each organ after a meal.



Which of the following is correct?

	Mouth	Gullet	Stomach	Small Intestine	Large Intestine
(1)	Q	T	P	S	R
(2)	Q	R	T	P	S
(3)	P	T	Q	S	R
(4)	P	T	R	Q	S

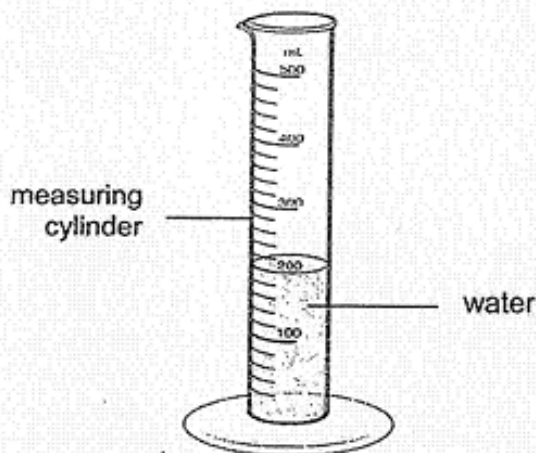
- 15 Timothy placed a packet of tea into a mug. None of the tea overflowed out, as shown in the picture below.



Which of the following about the packet of tea is correct?

- (1) Both the shape and the volume of the tea changed.
- (2) The shape of the tea changed but the volume did not.
- (3) The volume of the tea changed but the shape did not.
- (4) Both the shape and the volume of the tea did not change.

- 16 A measuring cylinder is used to measure the volume of an object. The diagram below shows a measuring cylinder filled with water.



The volume of an object can be found by putting it into the measuring cylinder and observing the change in water level.

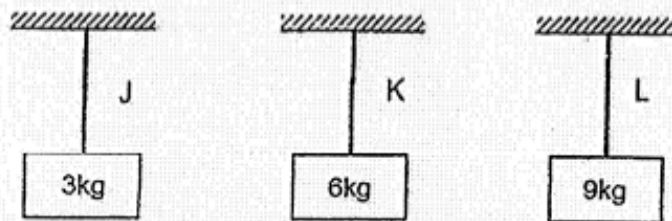
The table below shows the properties of four objects, P, Q, R and S.

Object	Does it float in water?	Is it waterproof?	Does it allow light to pass through?
P	No	Yes	Yes
Q	Yes	No	Yes
R	Yes	Yes	No
S	No	No	No

The volume of object ____ can be found using the above method described.

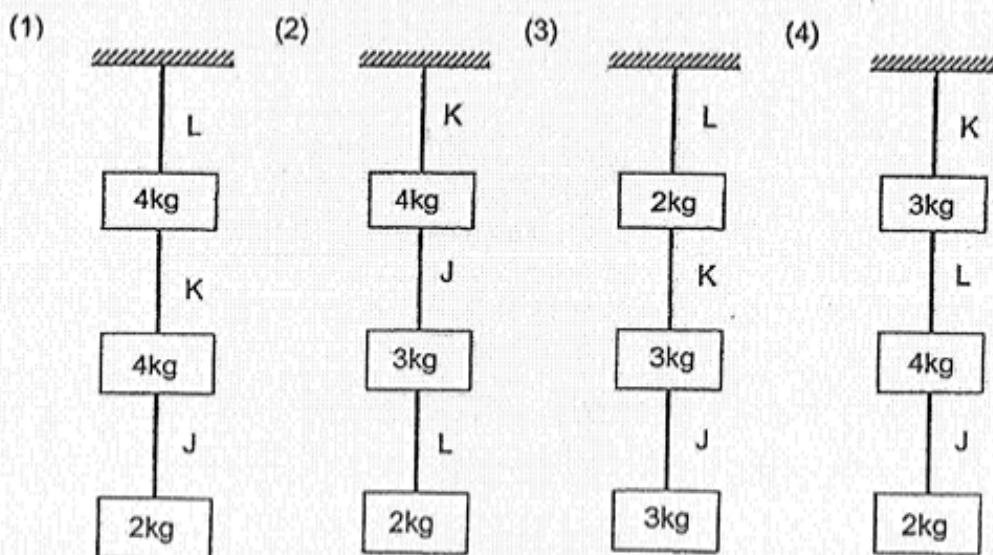
- (1) P
- (2) Q
- (3) R
- (4) S

- 17 Ruyi tested three types of string J, K and L by hanging weights on each string. She added more weights to each string until it broke. The maximum amount of weight that each string could hold before breaking is shown in the diagrams below.



Ruyi decided to hang the weights all in a row, attached at a single point to the top.

Which one of the following arrangements would be possible?



- 18 Which one of the following statements is true?

- (1) Steam is made of water droplets.
- (2) Melting is a process of losing heat.
- (3) Temperature of ice increases during melting.
- (4) Evaporation can take place at any temperature.

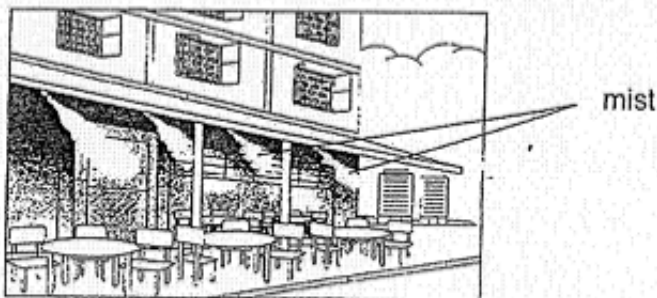
- 19 The table below shows the freezing points and boiling points of three unknown substances, P, Q and R.

Substance	Freezing point (°C)	Boiling point (°C)
P	40	95
Q	32	120
R	28	80

Which of the substances, P, Q and R is/are liquid at 85 °C?

- (1) P only
- (2) R only
- (3) P and Q only
- (4) Q and R only

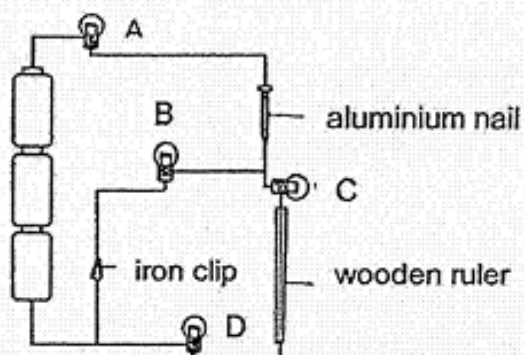
- 20 In some buildings, water mist systems are used to cool the surrounding air.



Which of the following explains how mist can cool the surrounding air?

- (1) Water vapour gains heat and condenses into mist.
 - (2) Tiny water droplets lose heat to the surrounding air.
 - (3) Warm surrounding air loses heat to the water droplets.
 - (4) Warm surrounding air gains heat from the water droplets.
- 21 Which of the following is a possible effect on the water cycle when the temperature of the environment decreases?
- (1) Evaporation of water decreases resulting in less rain.
 - (2) Condensation of water vapour increases resulting in less rain.
 - (3) Condensation of water vapour decreases resulting in more clouds.
 - (4) Evaporation of water increases resulting in more water vapour in the air.

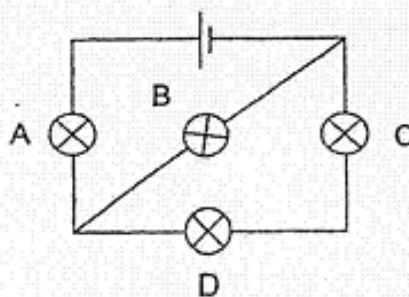
22 Study the electrical circuit below.



Which bulbs will not light up?

- (1) Bulbs A and B only
- (2) Bulbs C and D only
- (3) Bulbs A, C and D only
- (4) Bulbs A, B, C and D

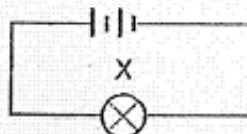
23 Samuel set up the circuit as shown below.



Which one of the bulbs, when fused, would allow the most number of bulbs in the circuit to remain lit?

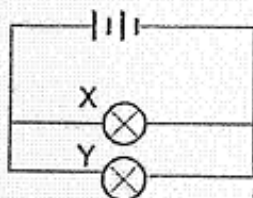
- (1) Bulb A
- (2) Bulb B
- (3) Bulb C
- (4) Bulb D

24 Daniel set up an electrical circuit as shown below.



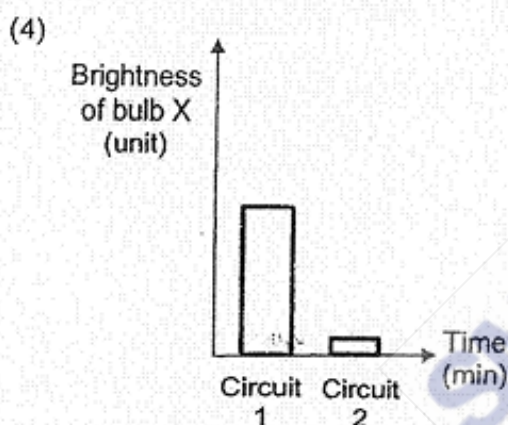
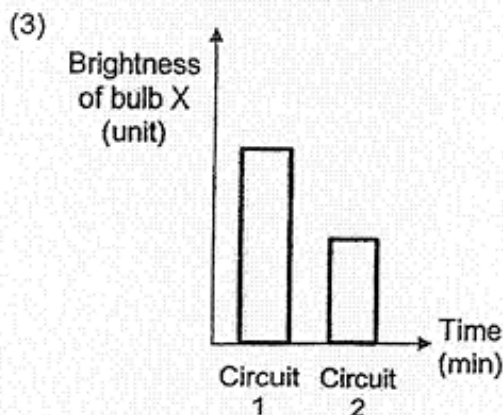
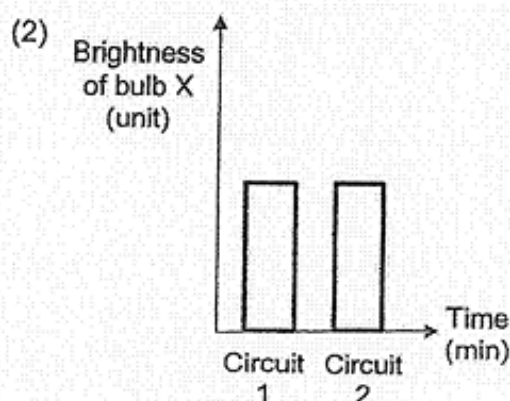
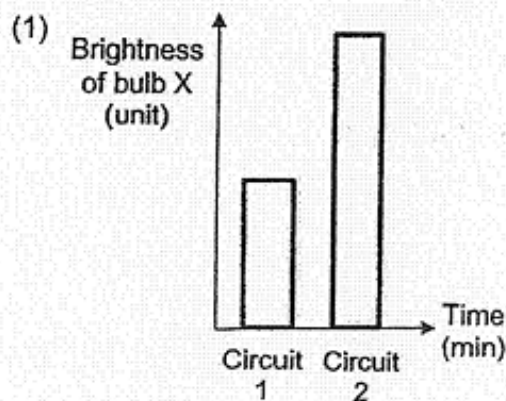
Circuit 1

He then added bulb Y to his circuit as shown below.

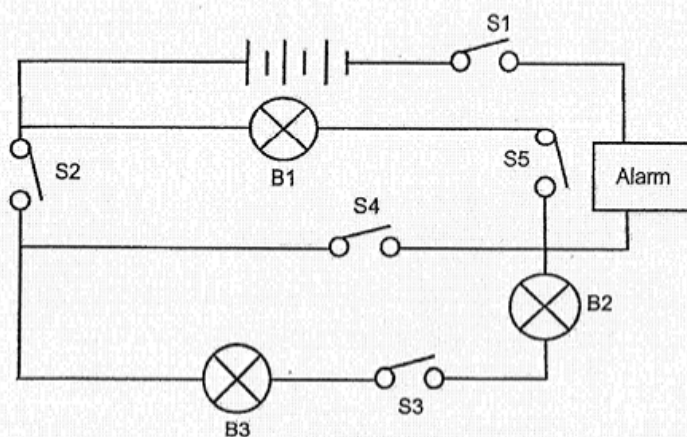


Circuit 2

Which of the following graphs correctly shows how the brightness of bulb X changes when bulb Y was added to the electrical circuit?



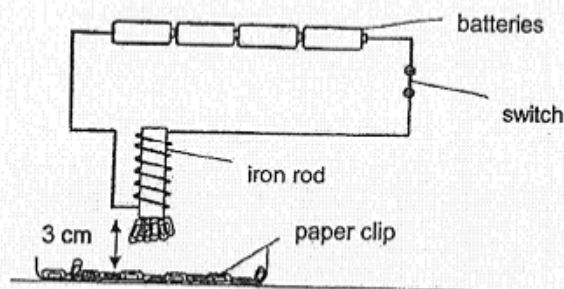
- 25 Raj sets up an electric circuit as shown below. There are three bulbs, B1 to B3 and five switches in the circuit, S1 to S5. He uses identical switches, bulbs and batteries in his circuit.



Raj only wants the alarm in his circuit to sound. Which switches should be opened or closed?

	Switch				
	S1	S2	S3	S4	S5
(1)	Close	Close	Open	Open	Open
(2)	Close	Close	Open	Open	Close
(3)	Close	Close	Open	Close	Open
(4)	Open	Open	Close	Open	Close

- 26 Aishah wanted to investigate how the number of batteries affects the number of paper clips attracted by a rod using the set-up below.

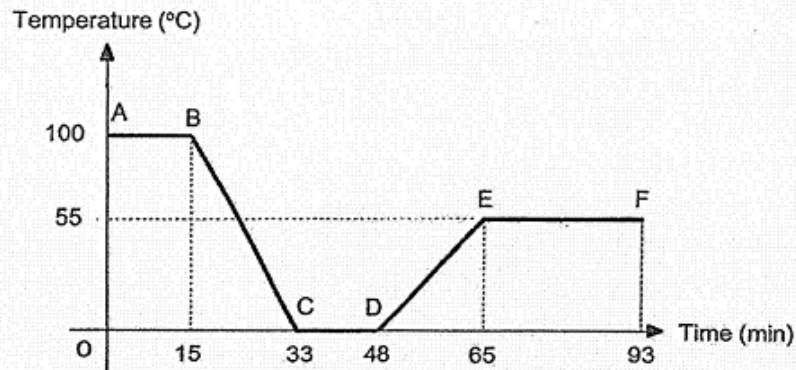


She placed the iron rod 3 cm away from the paper clips and found that it could attract some paper clips. When she added one more battery to the set-up, the number of paper clips attracted did not increase.

What could she do to attract the same number of paper clips when the iron rod was placed 6 cm away from the tray of paper clips?

- (1) Remove two batteries from the set-up.
- (2) Replace the iron rod with a copper rod.
- (3) Increase the number of coils of wire around the iron rod.
- (4) Decrease the number of coils of wire around the iron rod.

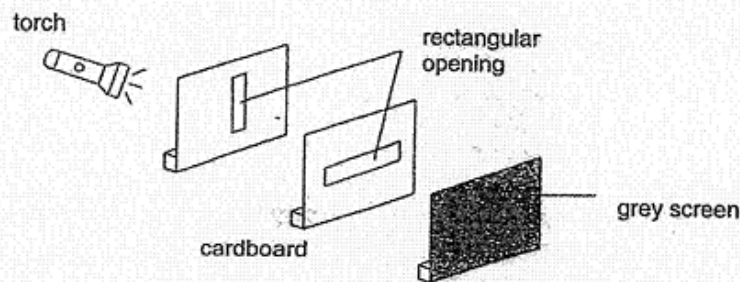
- 27 The graph below shows the changes in the temperature of water over a period of time.



Which one of the following statements is true?

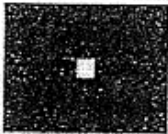
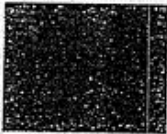
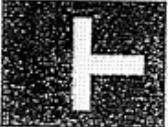

- (1) Water changed into ice only at D.
- (2) From D to E, water was gaining heat.
- (3) Evaporation took place only from E to F.
- (4) Water was freezing for 33 minutes from A to C.

- 28 Natasha set up the following experiment. She made a rectangular opening on each cardboard screen and lined them as shown in the diagram below.



She then switched on the torch and observed the light on the grey screen.

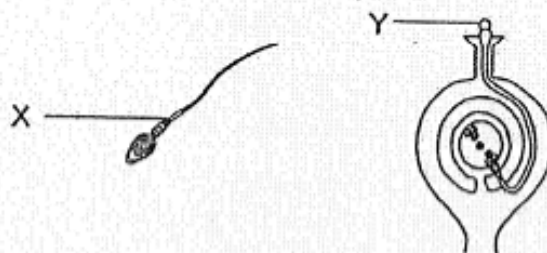
Which of the following would Natasha observe on the grey screen?

- | | |
|---|--|
| (1)  | (2)  |
| (3)  | (4)  |

End of Booklet A

For questions 29 to 40, write your answers in the spaces provided. The number of marks available is shown in brackets [] at the end of each question or part question.
 [44 marks]

- 29 X and Y are produced by the male reproductive organs of two different organisms.



- (a) Name the male reproductive cells, X and Y.

[1]

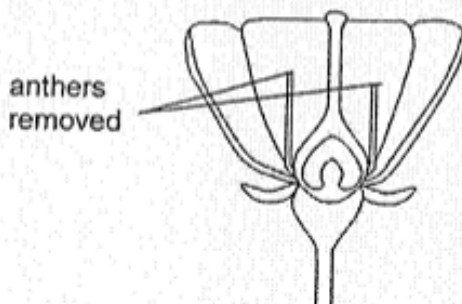
(i) X: _____

(ii) Y: _____

- (b) Why is X usually produced in large quantities?

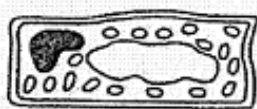
[1]

The diagram below shows an unfertilised flower with its anthers removed. After some time, the flower developed into a fruit.



- (c) Explain why the flower could still be developed into a fruit.

- 30 Ali examined two different cells under a microscope and recorded his observations in the table below.



Cell A



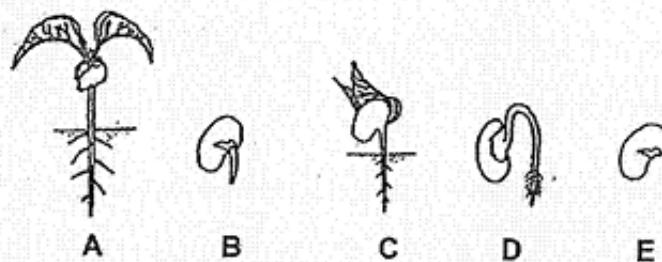
Cell B

part X

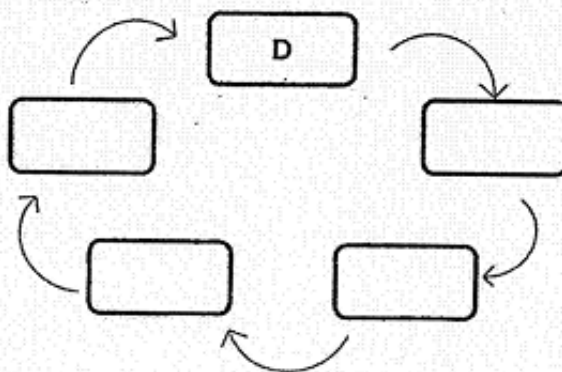
- (a) What is part X? Why is part X important to Cell B? [2]

- (b) Ali noticed that Cell B does not have chloroplasts like Cell A and concluded that it is not a plant cell. Do you agree with him? Explain your answer. [2]

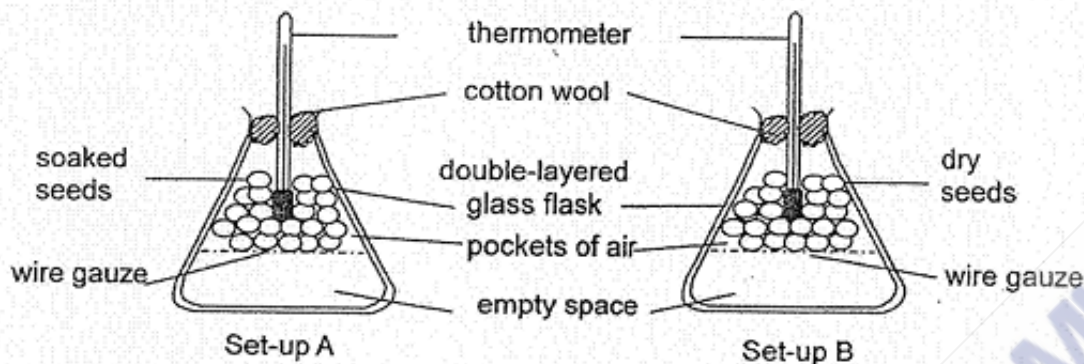
- 31 Sonia was given some seeds and she drew the pictures to show the stages of how one of the seeds germinated into a young plant.



- (a) Complete the stages of growth in the life cycle of the plant by filling in the boxes with the letters A, B, C and E. [1]



Sonia wanted to find out whether germinating seeds produce heat. She soaked some seeds in water before placing them in a glass flask as shown in set-up A. In set-up B, she used dry seeds instead.

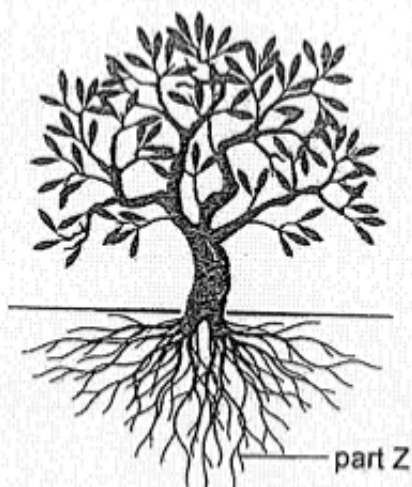


She measured the temperature in the flask and concluded that germinating seeds produced heat.

- (b) Besides providing air in the flask, give another reason why Sonia did not fill the flask completely with the seeds. [1]

- (c) Explain how using a double-layered glass flask with a layer of air in between helped Sonia to obtain more accurate results. [2]

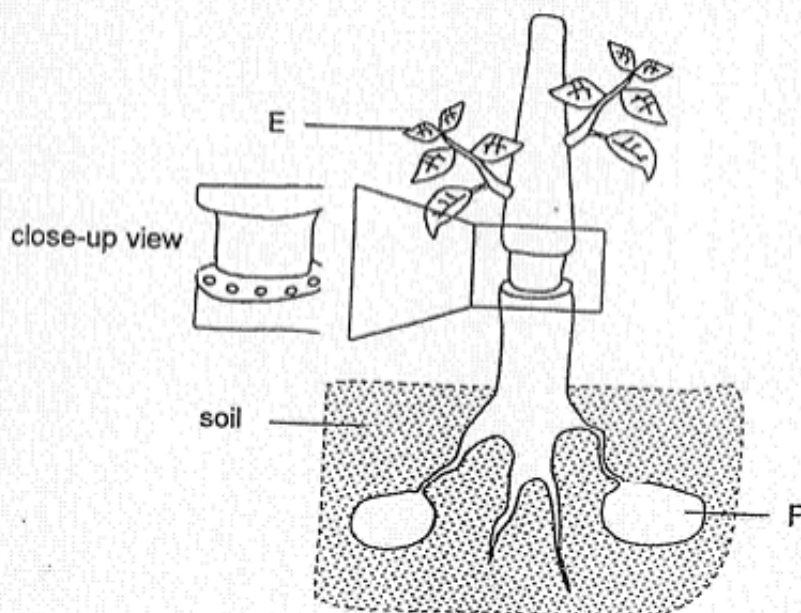
32 The picture below shows a tree.



(a) State two main functions of part Z of the tree.

[1]

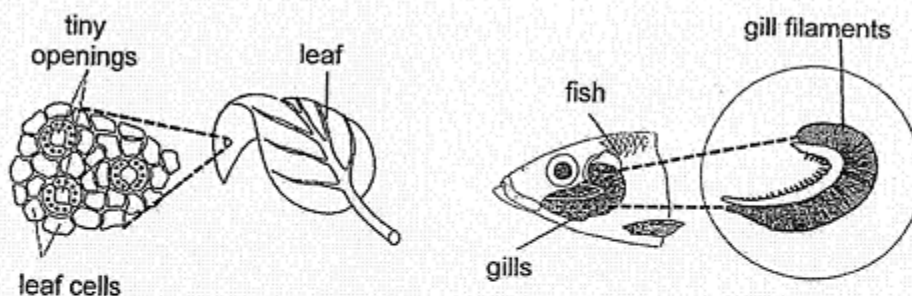
The diagram below shows the stem of a plant with an outer ring removed.



- (b) It was observed that Part E continued to grow bigger after two weeks. Explain why. [2]

- (c) Why did Part F remain the same size after two weeks? Explain your answer. [2]

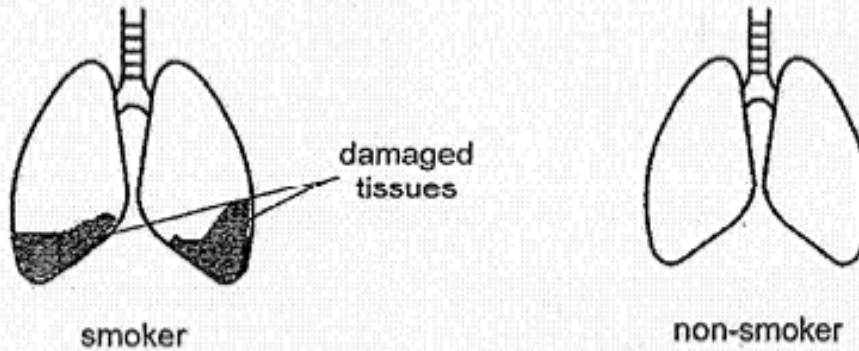
- 33 The diagram below shows the tiny openings on the underside of a leaf, as well as the gill filaments of a fish.



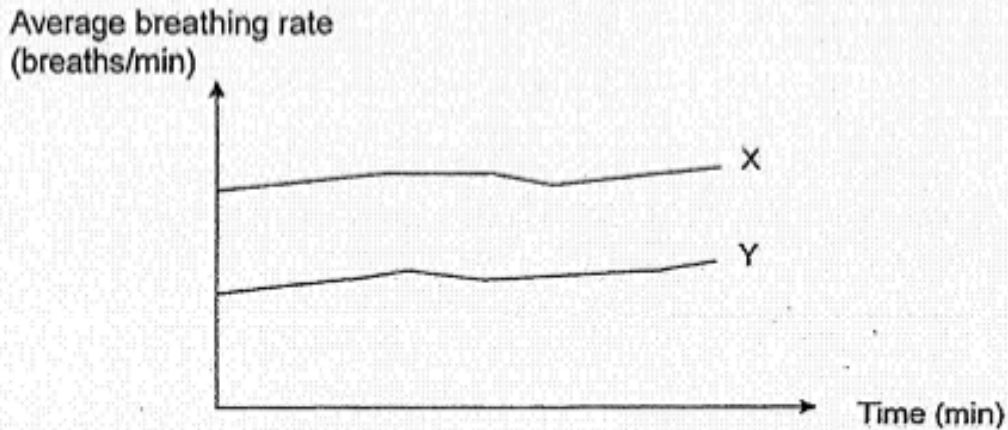
- (a) State one similarity between the functions of the tiny openings on the leaf and the gill filaments of the fish. [1]

- (b) The gills of the fish are made of many gill filaments. What is the advantage of having many gill filaments? [1]

- 34 The diagrams below show the lungs of a smoker and a non-smoker. Smoking can cause substances to be trapped in the walls of the air sacs in the lungs, damaging the tissues in the lungs.

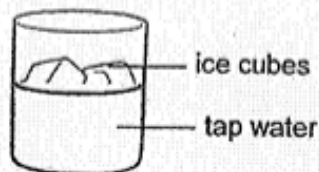


The graph below shows the breathing rates of a smoker and a non-smoker.



Based on the graph, which line, X or Y, more likely represents the breathing rate of a smoker? Explain your answer. [2]

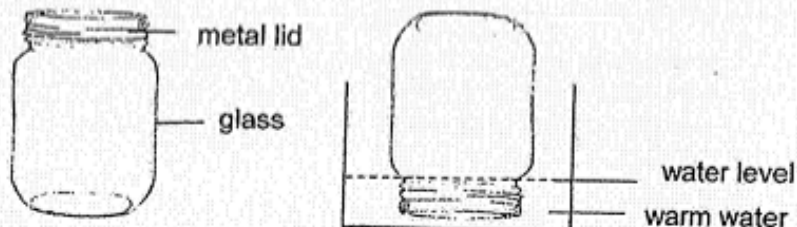
- 35 Isaac filled his glass with tap water. Then he put some ice cubes into it to make it cooler.



- (a) Explain how adding ice cubes will make the tap water cold.

[1]

Isaac found it very difficult to remove the lid of the jar below. He put the jar into a container of hot water for 5 minutes as shown below. He then found that he could remove the lid easily.



- (b) Explain how putting the metal lid of the jar into warm water made it easier to be removed.

[2]

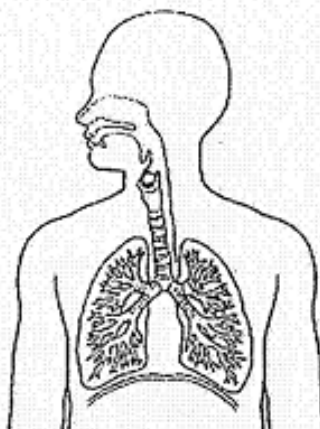
- (c) Isaac tried another method by putting the jar into the freezer.



After two hours, he took out the jar from the freezer and tried to remove the metal lid but could not. Explain why.

[1]

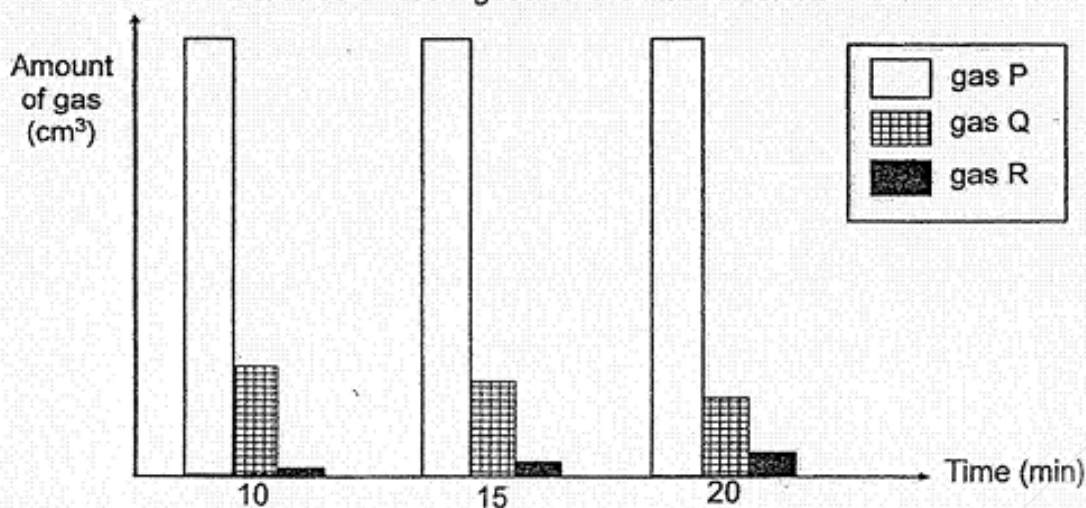
36 The diagram below shows the human respiratory system.



(a) Name the main parts of the respiratory system.

[1]

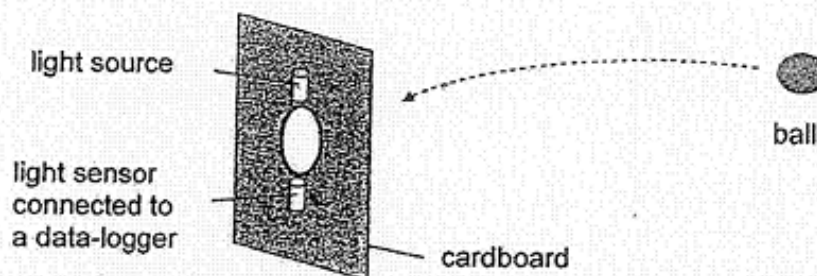
Twelve people were trapped in a lift. Some of the adults started kicking and banging on the door while some young children started crying. The graph below shows the amount of three different gases in the lift at different times.



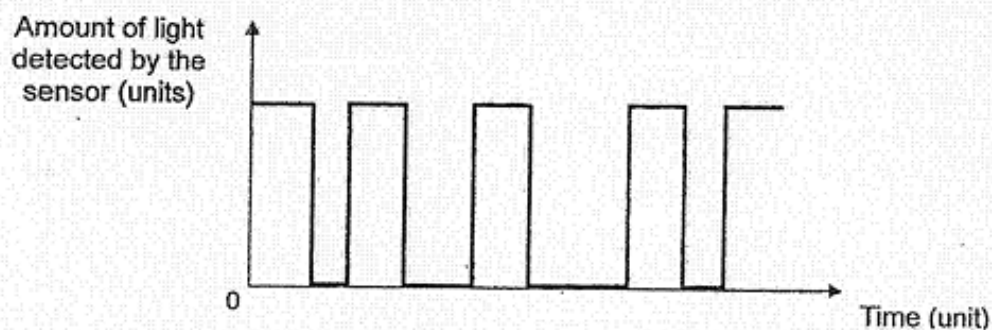
(b) If the adults had not kicked and banged on the lift door and children did not cry, but all of them kept still instead, would the amount of gas Q at the 20th minute be higher, the same, or lower than shown in the graph above? Explain your answer.

[2]

- 37 Raymond set up a light source and a light sensor to count the number of balls going through a hole as shown.



Raymond threw a few identical balls one at a time and recorded the following results.



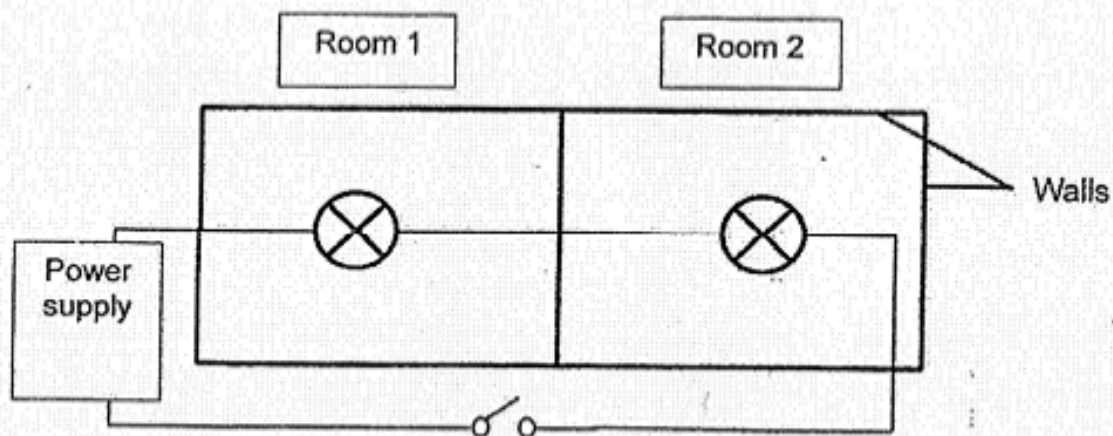
- (a) Based on the graph above, how many balls went through the hole?
Explain your answer.

[2]

- (b) Explain from the graph above how Raymond knew that the balls went through the hole at different speeds.

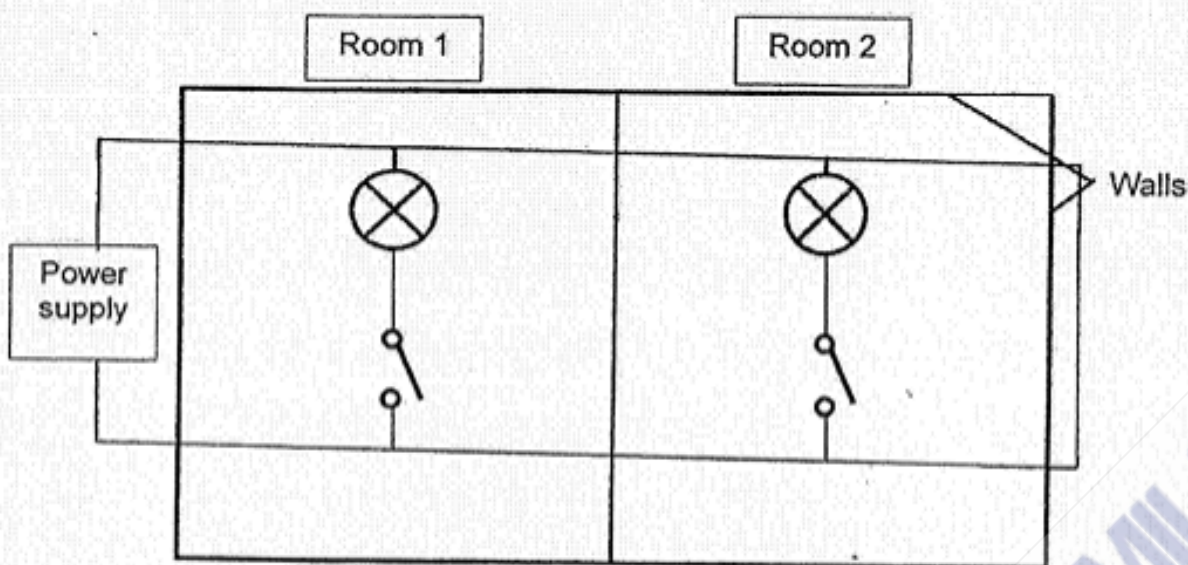
[1]

38 Mr Wong installed two bulbs in two rooms as shown in the diagram below.



He realised that he could not control the lighting in each room individually.

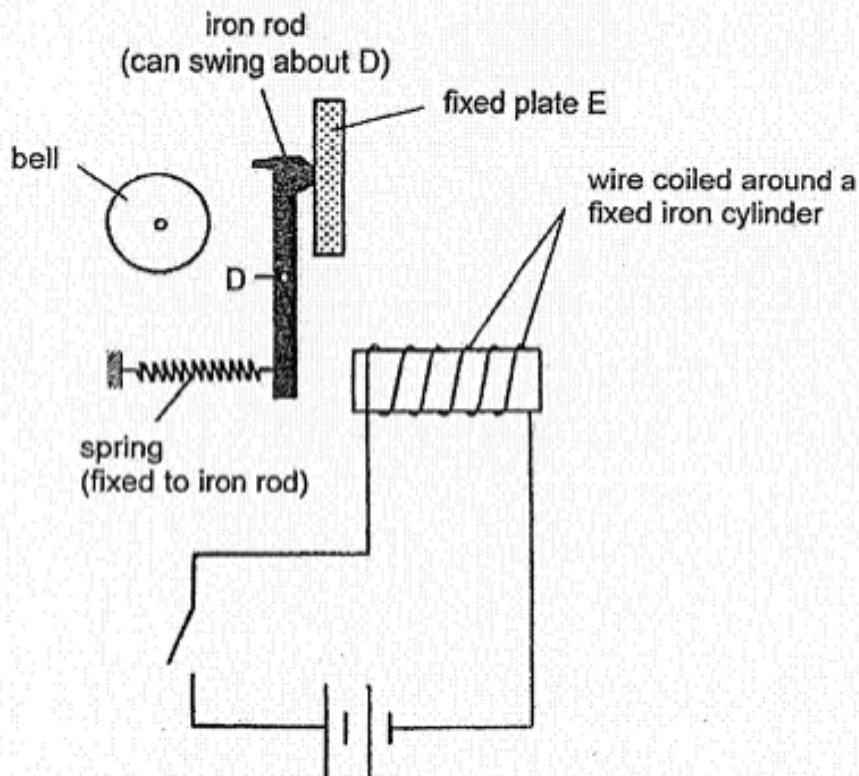
- (a) Complete the circuit diagram below to show how Mr Wong should connect the electrical components with some wires so that the bulb in each room can be controlled independently. [2]



- (b) List another advantage of the circuit you have drawn in (a). [1]

Mr Wong set up a doorbell as shown below.

The electric circuit and iron cylinder are fixed in place. The iron rod is able to swing about point D. A spring is fixed to the iron rod. The other end of the spring is fixed.



The iron rod hit the bell to produce a "ding" sound when Mr Wong closed the switch. When he opened the switch, the iron rod hit plate E to produce a "dong" sound.

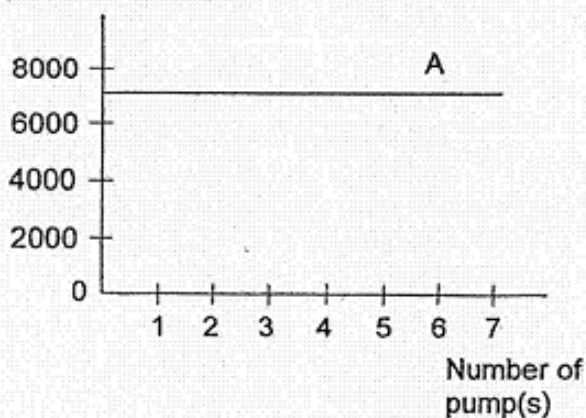
- (c) Explain how the "ding" sound is produced when Mr Wong closed the switch. [2]

- 39 Kamal had a deflated basketball. A fully inflated basketball has a capacity of 7000 cm^3 .

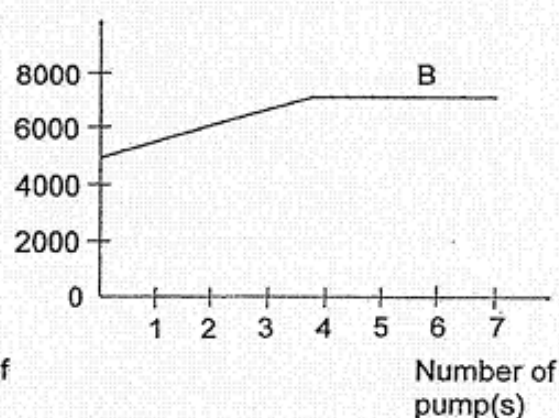


He used an air pump to pump air into the basketball a few times until it was fully inflated. He then recorded the volume of air inside the basketball in the graphs below.

Volume of air in the basketball (cm^3)



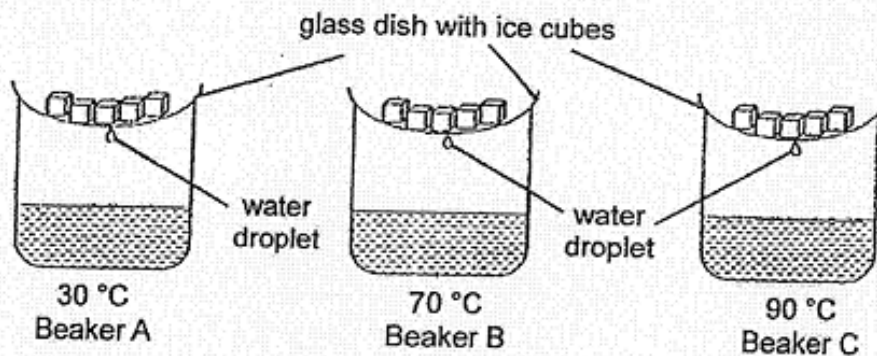
Volume of air in the basketball (cm^3)



- (a) Which line graph, A or B, is drawn correctly to show the volume of air in the deflated basketball to an inflated one? Explain your answer. [2]

- (b) When the basketball is fully inflated, Kamal found that he could still pump in more air. Explain why he could do so. [1]

- 40 Joshua carried out an experiment using the set-ups as shown below. Each beaker contained the same amount of water at different temperatures. He recorded the time taken for the first water droplet to drip from each glass dish.



The table below shows the results of his experiment.

Temperature of water (°C)	Time taken for the first water droplet to drip (min)
30	6
70	3
90	2

- (a) Based on the above results, how does the temperature of water affect the rate of evaporation?

[1]

- (b) Explain why water droplets in beaker C take the shortest time to form.

[2]

(c) Did Joshua conduct a fair test? Give a reason for your answer.

[1]

(d) If Joshua used beakers of different sizes for his set-ups, how would his results be affected?

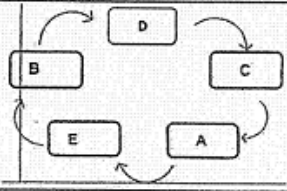
[1]

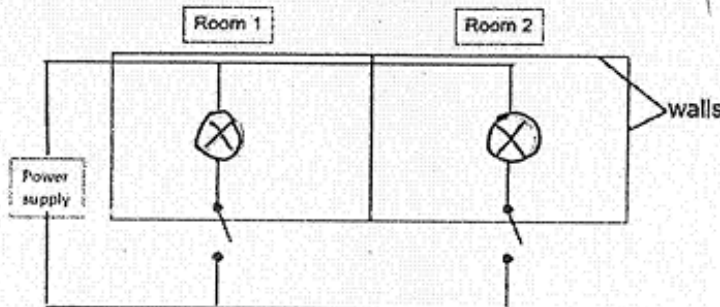
ANSWER SHEET

BOOKLET A

Q1	3	Q2	3	Q3	2	Q4	1	Q5	1
Q6	2	Q7	2	Q8	2	Q9	3	Q10	3
Q11	2	Q12	4	Q13	2	Q14	4	Q15	2
Q16	1	Q17	3	Q18	4	Q19	3	Q20	3
Q21	1	Q22	2	Q23	2	Q24	2	Q25	3
Q26	3	Q27	2	Q28	1				

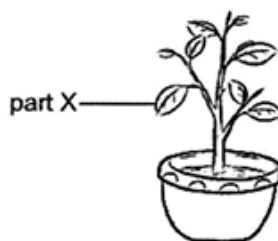
Section B: [13 questions - 44 marks]

Q.	Answers
29a	(i) X: Sperm (ii) Y: Pollen grain
29b	To increase the chances of the egg getting fertilized by the sperms.
29c	The stigma could still receive pollen grains from another flower carried by animals / insects. Fertilisation then took place for the ovary to develop into a fruit.
30a	Part X is the cell membrane. It controls the movement of substances into and out of the cell.
30b	No, I disagree with him. Cell B has a cell wall, so it is a plant cell. It is found in other plant parts that do not need to make food.
31a	
31b	This is to allow the seeds to have space to germinate.
31c	Air is a poor conductor of heat and it slows down heat loss from the seeds to the surroundings.
32a	Part Z absorbs water and minerals from the soil. Part Z anchors / holds the plant firmly to the ground.
32b	Part E can still receive water from the roots through the water-carrying tubes, to make food and grow bigger.
32c	As the food-carrying tubes were removed, part F did not receive more food made by the leaves, therefore it remained the same size.
33a	They allow gaseous exchange.
33b	The gill filaments increase the surface area of the gills to allow faster rate of exchange of gases.
34	Line X. It records a higher breathing rate. Smoker has damaged lung tissues which leads to reduced surface area of the lungs for gaseous exchange.
35a	Water loses heat to the ice cubes.

35b	Metal is a good conductor of heat, so the metal lid will gain heat from the hot water quickly and expands.
35c	The metal lid contracted more than the jar, so it became tighter and more difficult to remove.
36a	Nose, Windpipe, Lungs
36b	Higher amount. Less movement will cause breathing rate to decrease. Therefore, the adults and children in the lift will not take in so much gas Q more quickly.
37a	Four balls. When a ball passed through the hole, it blocked the light from reaching the light sensor, so the reading on the light sensor will be zero.
37b	The duration for the light to be blocked by each ball is different.
38a	
38b	When one bulb fused, the other bulb can still light up.
38c	When the switch is closed, an electric current flowed through the coil of wire and magnetised the iron cylinder to become an electromagnet which then attracts the iron rod. The iron rod swings at point D, moves towards the bell and hits the bell to produce a "ding" sound.
39a	Line B. Before pumping, the deflated basketball has a volume of less than 7000 cm^3 . After 5 pumps, the volume of air in the basketball increased and became constant when it reached the maximum capacity of 7000 cm^3 .
39b	Air has no definite volume.
40a	As the temperature of water increases, the rate of evaporation increases.
40b	The temperature of water in beaker C is the highest and it will evaporate into water vapour fastest. Water vapour condenses into water droplets faster when it touches the cooler surface of the glass dish.
40c	Yes, there should only be one changed variable which is the temperature of the water.
40d	Different sizes of containers will lead to a difference in the exposed surface area of water. This will result in a difference in the rate of evaporation, affecting the time taken for the first water droplet to form from condensation.

NAN HUA PRIMARY SCHOOL EOY PAPER

- 1 The diagram below shows part X of a plant.

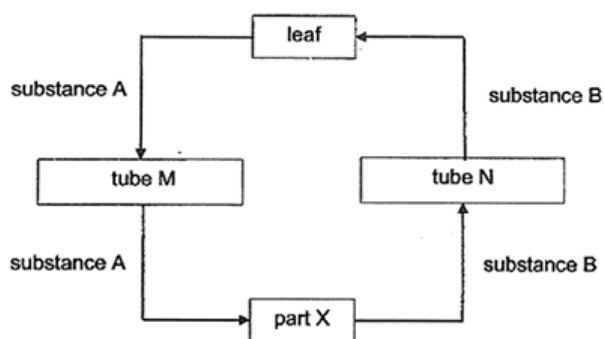


What is/are the function(s) of part X?

- A taking in air
- B making food
- C taking in water

- (1) B only
- (2) A and B only
- (3) A and C only
- (4) B and C only

- 2 The diagram below represents the transport system of a plant.



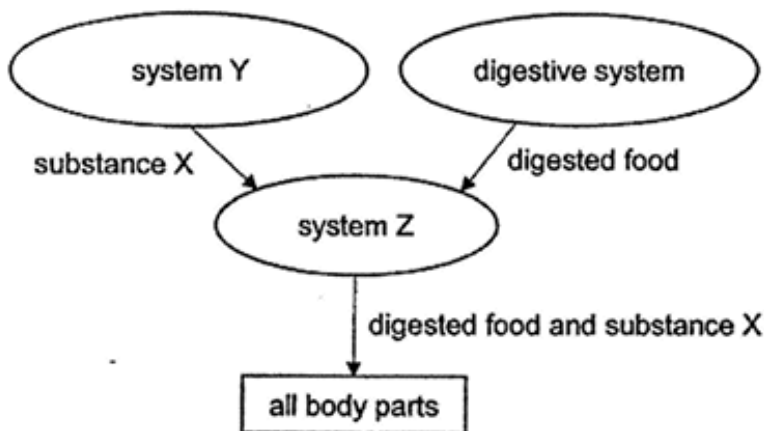
Which of the following correctly identifies part X and substances A and B?

	part X	substance A	substance B
(1)	stem	water	food
(2)	leaf	food	water
(3)	root	water	food
(4)	root	food	water

- 3 At which organ of the digestive system is water from the undigested food being absorbed?

- (1) gullet
- (2) mouth
- (3) stomach
- (4) large intestine

- 4 The diagram below shows how three body systems work together. The arrows show the movement of some important substances in the body.



Which of the following correctly matches substance X and body systems Y and Z?

	substance X	system Y	system Z
(1)	oxygen	circulatory	respiratory
(2)	oxygen	respiratory	circulatory
(3)	carbon dioxide	circulatory	respiratory
(4)	carbon dioxide	respiratory	circulatory

- 5 Which of the following comparisons between the plant transport system and the human transport system is correct?

	Plant Transport System	Human Transport System
(1)	Blood in the tubes transport the substances	Water in the blood vessels transport the substances
(2)	Has one network of tubes to transport the substances	Has two network of tubes to transport the substances
(3)	Transports food produced in the leaves	Transports only undigested food to all parts of the body
(4)	Does not have an organ to pump the substances to all other parts	Has an organ to pump the substances to all other parts

- 6 Ben was trapped in a lift with a group of people when it stopped working for 45 minutes. The fan in the lift was not working and the lift door was tightly shut.

Which of the following is the most likely changes to the amount of oxygen, carbon dioxide, nitrogen and water vapour in the lift after 45 minutes?

(1)

Gas	Change
Oxygen	Decrease
Carbon dioxide	Increase
Nitrogen	No change
Water vapour	No change

(2)

Gas	Change
Oxygen	Decrease
Carbon dioxide	Increase
Nitrogen	No change
Water vapour	Increase

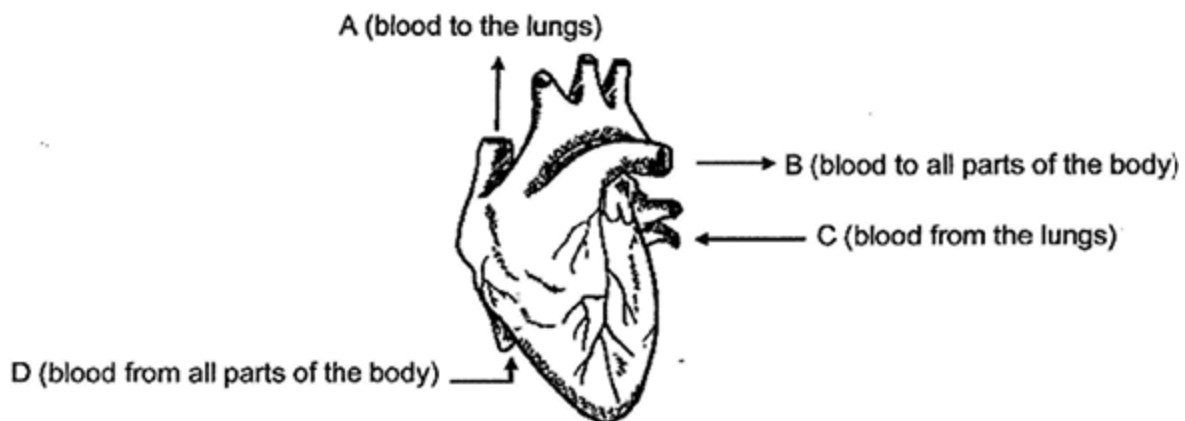
(3)

Gas	Change
Oxygen	Increase
Carbon dioxide	Decrease
Nitrogen	No change
Water vapour	Decrease

(4)

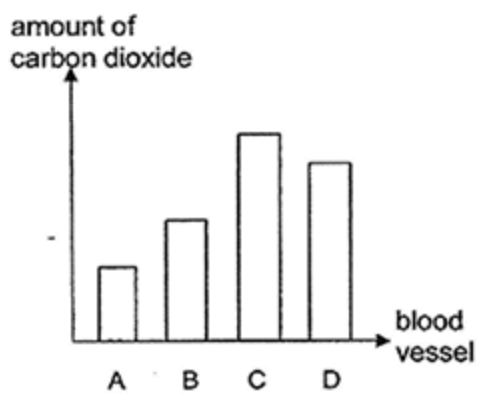
Gas	Change
Oxygen	Decrease
Carbon dioxide	Increase
Nitrogen	Increase
Water vapour	No change

- 7 The diagram below shows a human heart that receives blood and pumps it to different parts of the body.

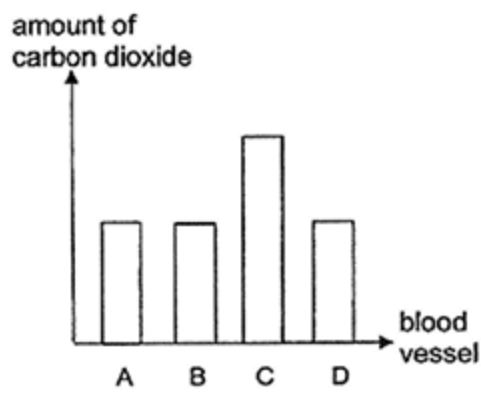


Which of the following graphs shows the amount of carbon dioxide in the different blood vessels, A, B, C and D?

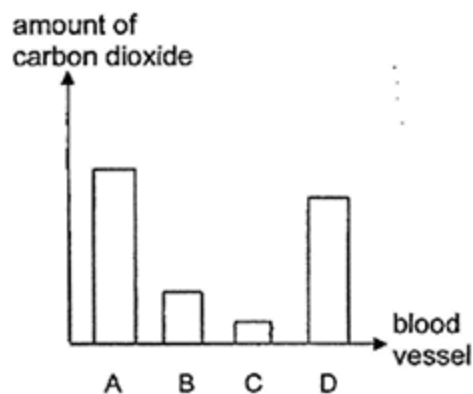
(1)



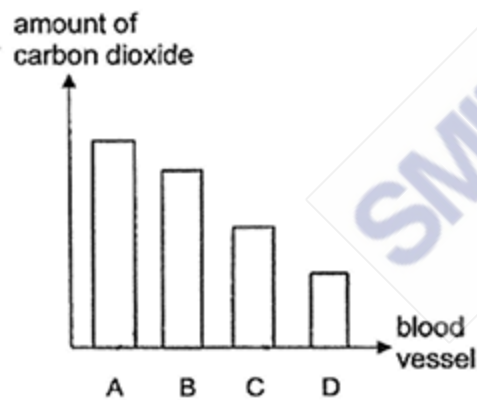
(2)



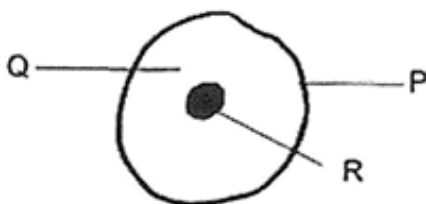
(3)



(4)



- 8 Alex examines the animal cell as shown below and writes some statements.



- A Q is a jelly-like substance.
 B R controls the activities within the cell.
 C P is a cell wall which gives the cell a regular shape.

Which of the statements written by Alex are correct?

- (1) A and B only
 (2) A and C only
 (3) B and C only
 (4) A, B and C

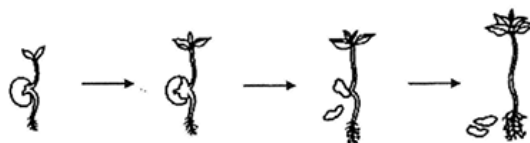
- 9 Belle was asked to identify three cells, A, B and C.

Parts of a cell	Name of cell		
	Cell A	Cell B	Cell C
nucleus	present	present	present
cell wall	present	absent	present
cytoplasm	present	present	present
chloroplasts	present	absent	absent
cell membrane	present	present	present

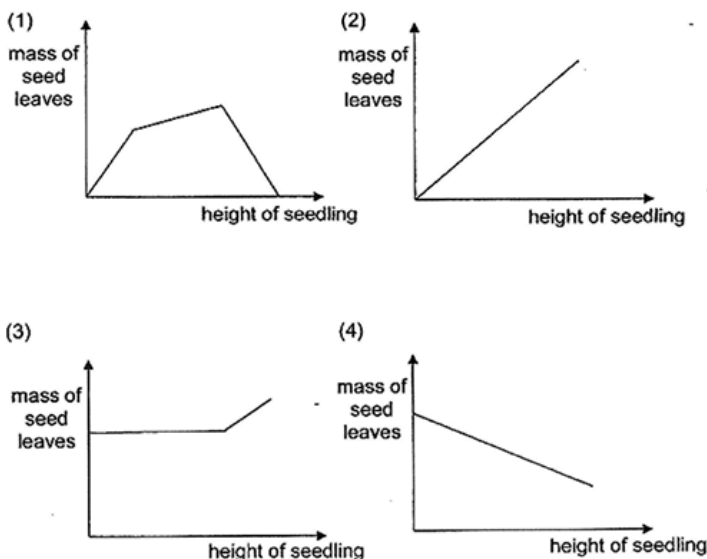
Based on the information in the table above, what could cells, A, B and C be?

	Cell A	Cell B	Cell C
(1)	cheek cell	leaf cell	root cell
(2)	leaf cell	cheek cell	root cell
(3)	root cell	cheek cell	leaf cell
(4)	leaf cell	root cell	cheek cell

- 10 The diagram below shows the development of a germinating seed.



Which of the following graphs correctly shows the relationship between the mass of the seed leaves and the height of seedling?



- 11 The table below shows what a pupil had observed about the growth of insect X.

Date	Observation
6 August	Many eggs were laid.
10 August	Most eggs hatched into larvae.
18 August	Some larvae became pupae.
29 August	Some pupae became adult insects.

Based only on the information in the table above, which statement about insect X is correct?

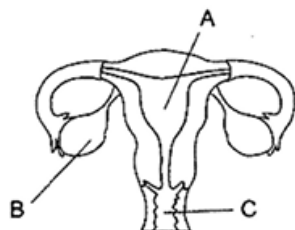
- (1) All the eggs hatched into larvae.
- (2) The larva stage comes right after the pupa stage.
- (3) It took six days for the larvae of insect X to hatch from the eggs.
- (4) Insect X spends most of its life as a pupa before becoming an adult.

- 12 The characteristics that can be passed from parents to their offspring are _____.

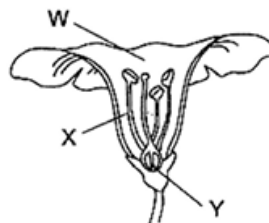
P fingerprint
 Q length of hair
 R curved thumb
 S type of eyelid

- (1) P and R only
- (2) Q and S only
- (3) R and S only
- (4) P, R and S only

- 13 Sammy drew the reproductive parts of a human and a plant respectively.



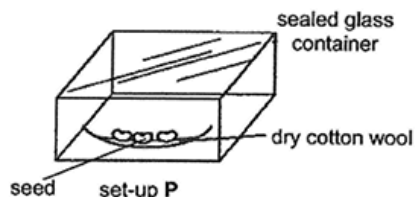
human reproductive system



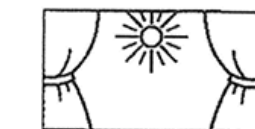
plant reproductive system

Which two parts indicate where the development of a fertilised egg take place in the human reproductive system and the plant reproductive system?

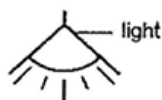
- (1) A and X
 - (2) A and Y
 - (3) B and Y
 - (4) C and W
- 14 Study the diagrams below. The set-ups, P, Q, R and S, are placed on the table in the science laboratory.



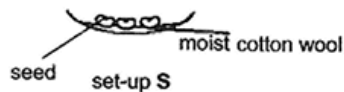
seed set-up P



seed set-up Q dry cotton wool



seed set-up R moist cotton wool

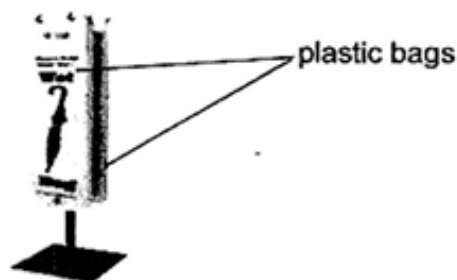


seed set-up S

In which of the set-ups above will the seeds be able to germinate?

- (1) P and Q only
 - (2) Q and R only
 - (3) R and S only
 - (4) Q, R and S only
- 15 For an adult plant to produce seeds, which of the following process(es) must take place?
- (1) germination only
 - (2) cross-pollination only
 - (3) pollination and fertilization
 - (4) germination and pollination

- 16 The diagram below shows the plastic bags used to fit wet umbrellas to keep the floor in the shopping malls dry on rainy days.



Which two properties must these plastic bags have to serve the purpose?

- (1) strong and stiff
 - (2) light and transparent
 - (3) waterproof and flexible
 - (4) waterproof and transparent
- 17 Jess wanted to know if an object X has magnetic properties. She carried out some tests and wrote her observations of object X as shown below.

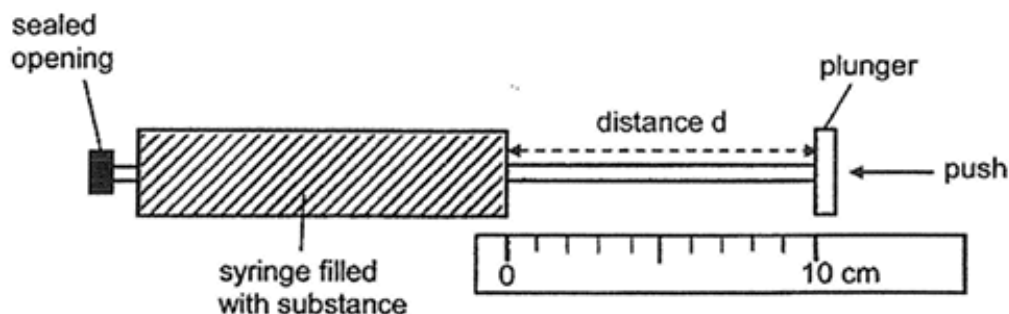
Object X:

- is attracted to a magnet
- comes to rest in an east-west direction when hung freely

What could object X be?

- (1) iron bar
- (2) glass rod
- (3) bar magnet
- (4) wooden block

- 18 Mingwei completely filled up three similar syringes, each with a different substance of either air, cotton wool or water. The opening of each syringe was sealed and the plunger was at the 10 cm mark at first.

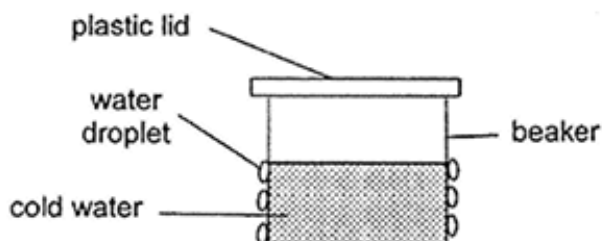


Mingwei pushed the plunger of each of the syringes inwards with an equal amount of force.

Which of the following was likely the distance d , recorded for each syringe after the push?

	Distance d for syringe filled with air (cm)	Distance d for syringe filled with cotton wool (cm)	Distance d for syringe filled with water (cm)
(1)	5	7	5
(2)	5	7	10
(3)	10	5	7
(4)	7	10	10

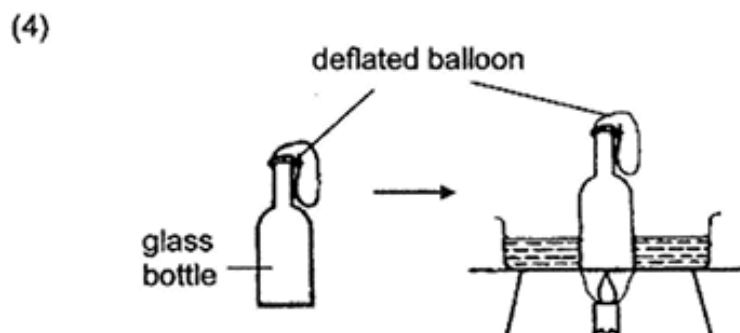
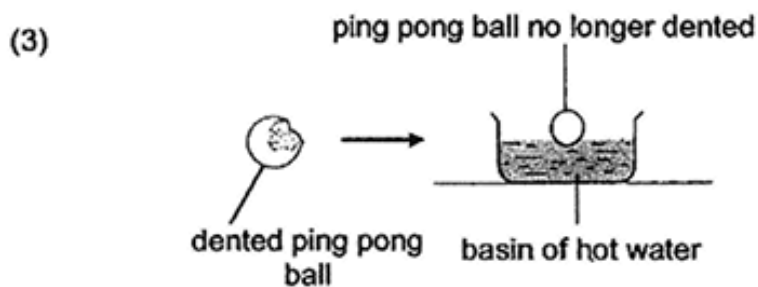
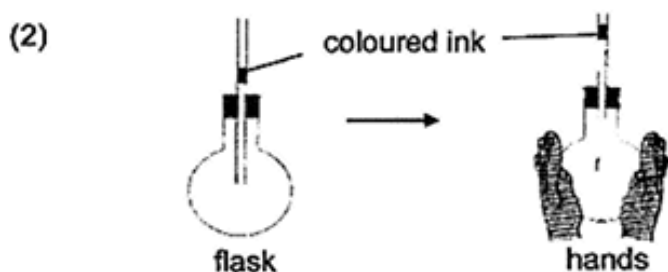
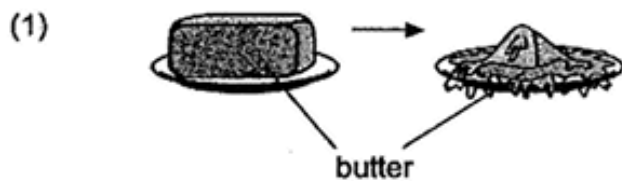
- 19 Kate poured some cold water into a beaker. After five minutes, she observed some water droplets forming on the beaker as shown below.



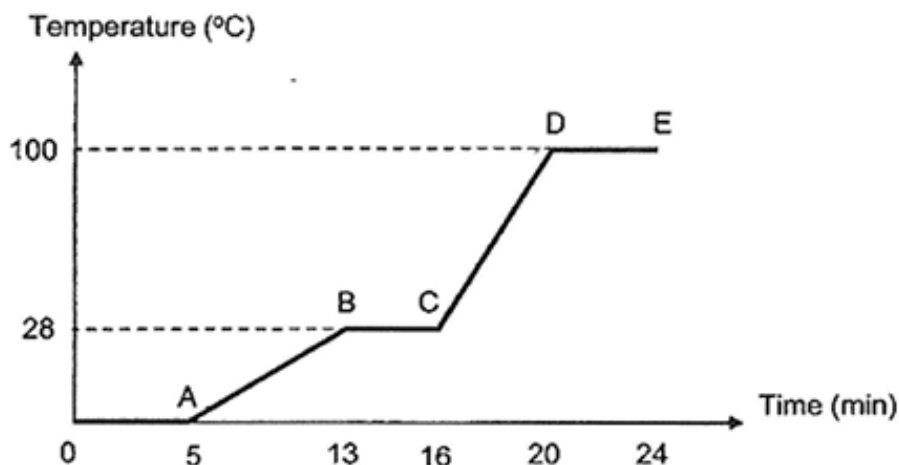
Which of the following process resulted in the formation of the water droplets?

- (1) boiling
- (2) melting
- (3) evaporation
- (4) condensation

20 Which of the following diagrams does **not** show the effect of heat gain correctly?



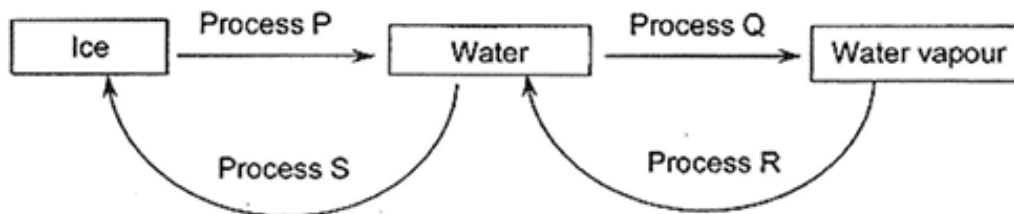
- 21 A beaker of ice cubes was left on a table to melt. After melting, the water later reached room temperature. The water was then heated over a flame until it boiled. The following graph was plotted to show the changes in temperature over the period of time.



Based on the graph, which of the following statements is **not** correct?

- (1) The room temperature was 28 °C.
- (2) All ice cubes had melted after 5 minutes.
- (3) Heat from a flame was supplied at point B.
- (4) There was a change of state at points D to E in the experiment.

- 22 Water changes from one state to another as shown in the diagram below.

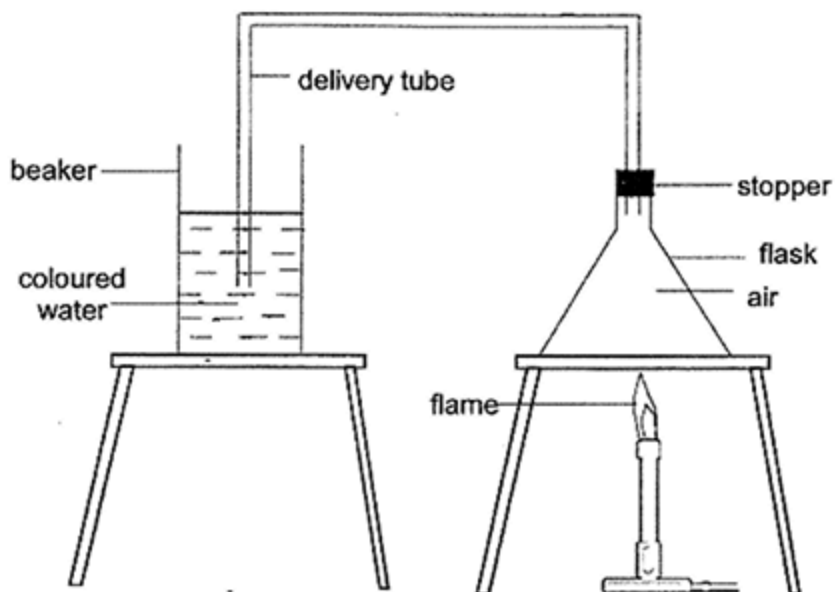


Which of the following statements are correct?

- A Process S is condensation.
- B Process Q can only happen at 100 °C.
- C Process Q involves heat gain by the water.
- D Water vapour loses heat during process R.

- (1) A and B only
- (2) C and D only
- (3) B, C and D only
- (4) A, B, C and D

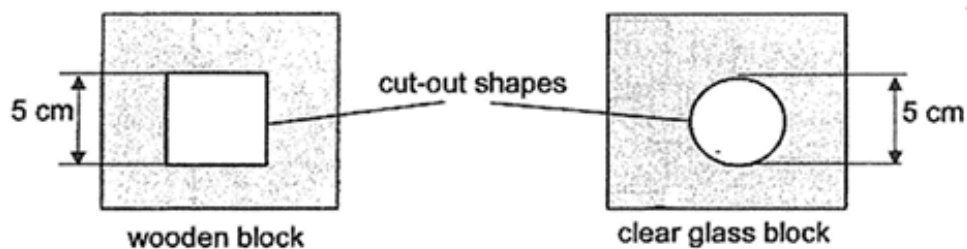
- 23 Thiru prepared a set-up to investigate the effect of heat on the volume of air in the flask as shown below.



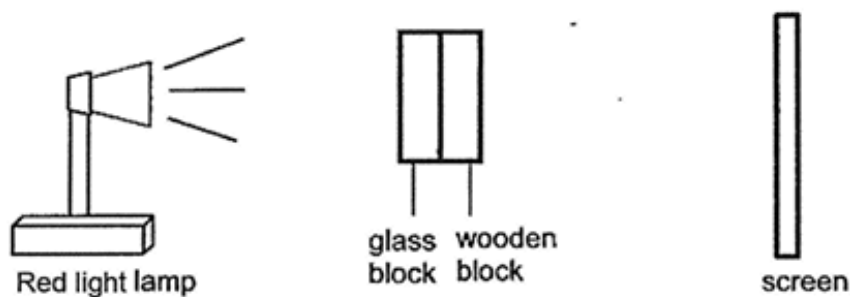
Which of the following correctly describes the observation of the experiment and the explanation for the observation?

	Observation	Explanation
(1)	Coloured water from the beaker was drawn into the flask through the delivery tube.	Air in the flask lost heat and contracted. This created a space for the coloured water to move towards the flask.
(2)	Coloured water from the beaker was drawn into the flask through the delivery tube.	Air in the flask gained heat and expanded. This created a space for the coloured water to move towards the flask.
(3)	Air bubbles are observed leaving the coloured water after passing through the delivery tube.	Air in the flask gained heat and expanded. Some of the warm air was pushed through the delivery tube and escaped as bubbles in the coloured water.
(4)	Air bubbles are observed leaving the coloured water after passing through the delivery tube.	Air in the flask lost heat and contracted. Some of the cool air was pushed through the delivery tube and escaped as bubbles in the coloured water.

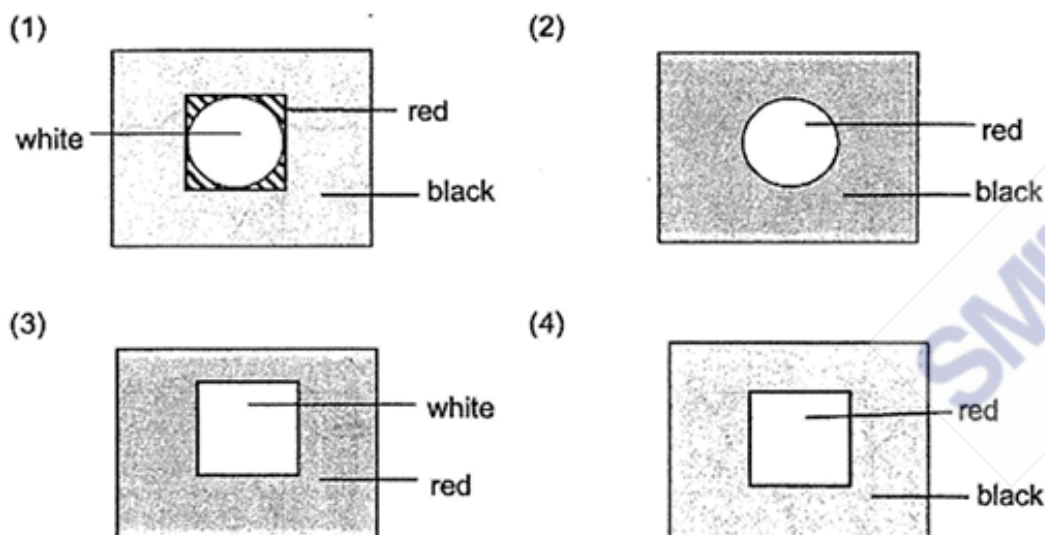
- 24** Hailey cut out a square shape from a wooden block and a circular shape from a clear glass block as shown below.



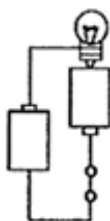
She then glued the two blocks together. A lamp with red light was brought near the two blocks as shown in the diagram below.



Which one of the following was most likely to be the shadow formed on the screen?

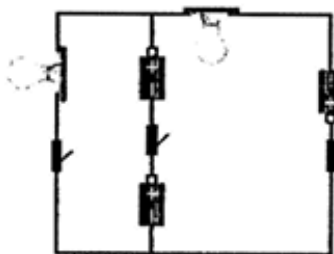


- 25 The diagram below shows the different components that make up an electric circuit.

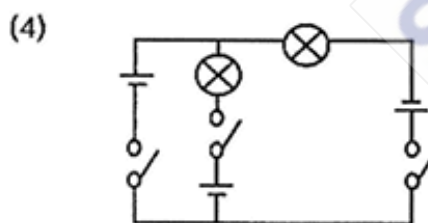
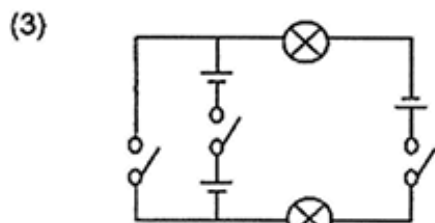
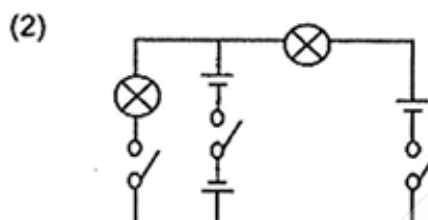
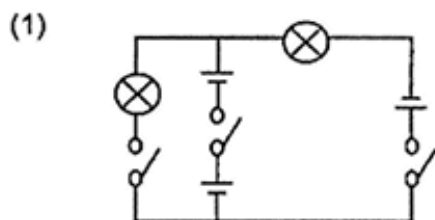


Which of the following components is the energy source for the circuit?

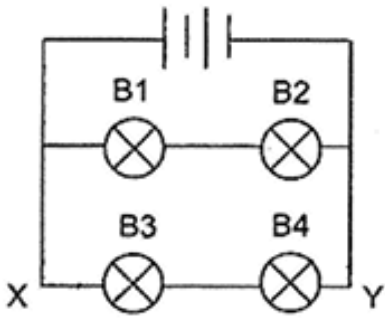
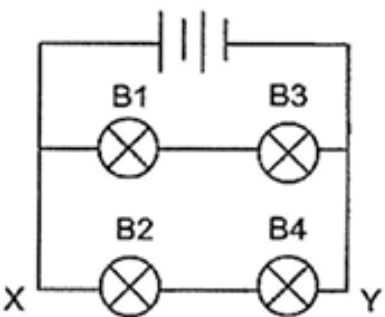
- (1) bulb
 - (2) wire
 - (3) switch
 - (4) battery
- 26 The diagram below shows an electrical system made up of three switches, two light bulbs and three batteries.



Which of the following circuit diagrams shows the correct representation of the actual system shown above?



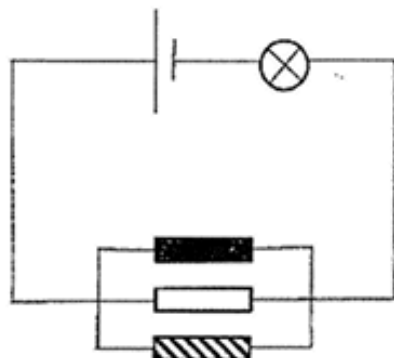
- 27 Four students set up an electrical circuit with four identical bulbs, B1, B2, B3 and B4. They recorded the number of bulbs that lit up after varying the positions of the bulbs. Their observations were as shown below.

First arrangement	Observations
	<ul style="list-style-type: none"> Only bulbs B1 and B2 lit up
Second arrangement	Observations
	<ul style="list-style-type: none"> None of the bulbs lit up

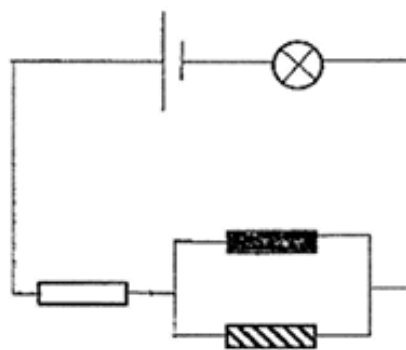
Which of the following was a possible reason to explain why some bulbs did not light up based on the observations above?

- (1) Bulb B3 was the only faulty bulb.
- (2) Bulb B4 was the only faulty bulb.
- (3) Wires along X to Y had disconnected.
- (4) Bulbs B3 and B4 were the only faulty bulbs.

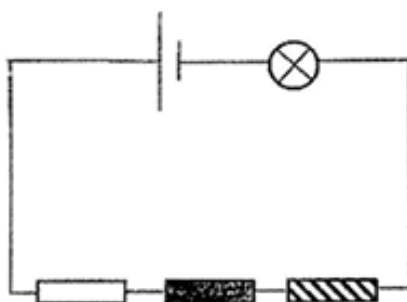
- 28** Three electrical circuits, X, Y and Z, are set up as shown below. Each circuit consists of a battery, a bulb and three rods made of different materials, namely iron, wood and plastic.



circuit X



circuit Y



circuit Z

In which of the above circuit(s) would the bulb light up?

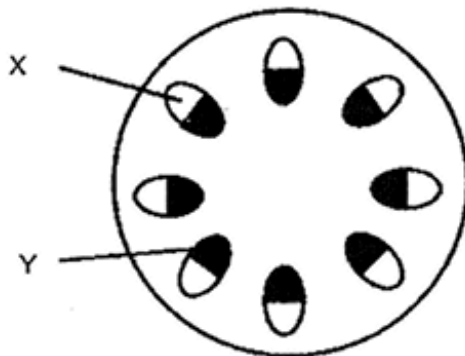
- (1) Circuit X only
- (2) Circuits X and Y only
- (3) Circuits Y and Z only
- (4) None of the circuits above

Section B: (44 marks)

Write your answers to question 29 to 41 in the space provided.

The number of marks available is shown in brackets [] at the end of each question or part question.

- 29** The diagram below shows a cross-section of a plant transport system.



- (a)** Name the parts, X and Y, as shown in the diagram above.

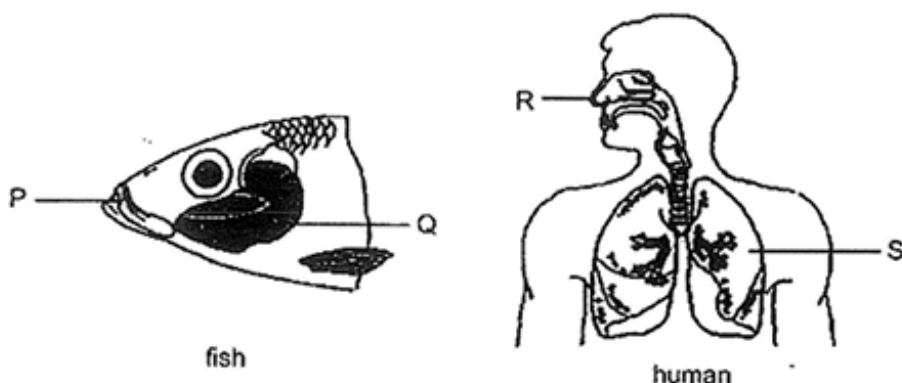
X : _____ [1]

Y : _____ [1]

- (b)** What would happen to the plant after a month if all of part X are damaged? Explain your answer. [1]

- (c)** What is the function of part Y? [1]

30 The diagrams below show the respiratory systems of a fish and a human.



- (a) At which positions, P, Q, R or S, do gaseous exchange take place in a fish and a human? [1]

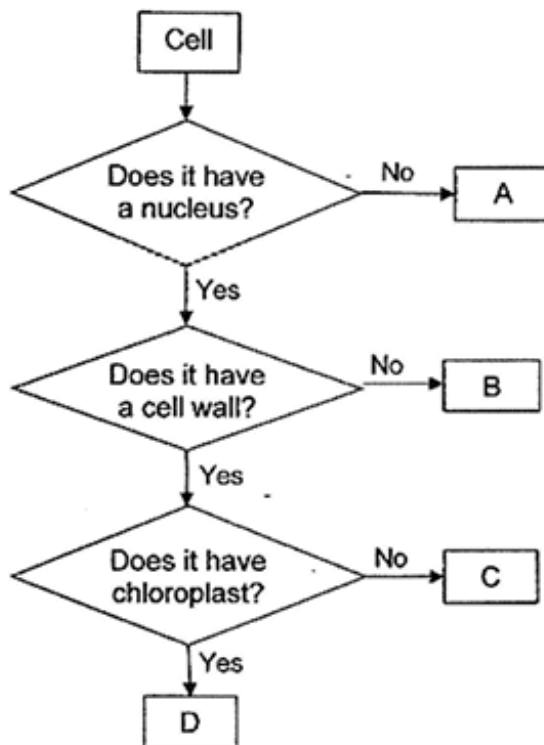
Fish : _____

Human : _____

- (b) Explain why the blood needs to be transported back to the lungs in the human respiratory system. [1]

- (c) Describe clearly how the fish gets oxygen for its survival. [2]

31 Study the flow chart below carefully.



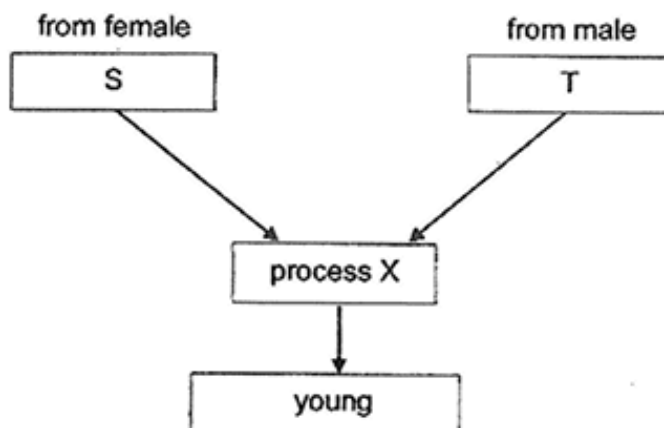
- (a) Based on the flow chart, put a tick in the correct box for the type of cell as indicated in the flow chart. [2]

Type of Cell	A	B	C	D
Cheek cell				
Leaf cell				

- (b) Based on the flow chart, which type of cell, A, B, C or D, is taken from the root of a plant? Explain your answer. [1]

- (c) Based on the flow chart, state one difference between cell A and cell B. [1]

32 The flow chart below shows the human reproductive system.



- (a)** Based on the flow chart above, name the reproductive cells that both the letters, S and T, represent. [1]

S: _____

T: _____

- (b)** What is process X? Describe what happens during the process. [1]

- (c)** Where does the young develop in the human reproductive system? [1]

33 Susan records the characteristics of fruits W, X and Y in the table below.

Description of fruit	Characteristics of fruit W	Characteristics of fruit X	Characteristics of fruit Y
Is edible	yes	yes	no
Has fibrous husk	no	yes	no
Is juicy and fleshy	yes	no	no
Is bright red only when ripe	yes	no	no
Has wing-like structure	no	no	yes

(a) What is the likely method of seed dispersal for fruit W? [1]

(b) Describe how being juicy and fleshy help the seeds to be dispersed further away from the parent plant. [1]

Diagram 1 below shows the seed dispersal pattern of one of the fruits.

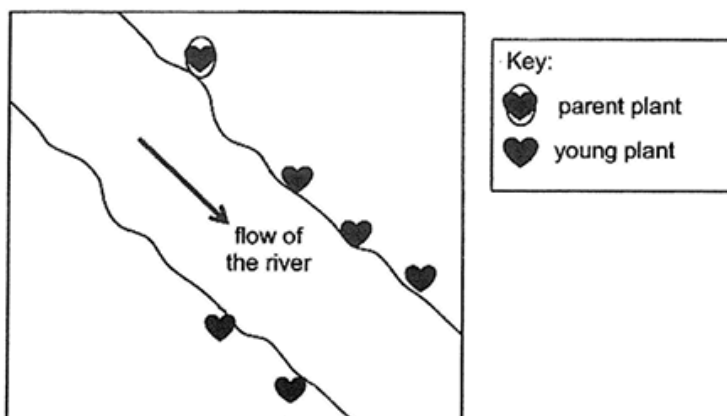
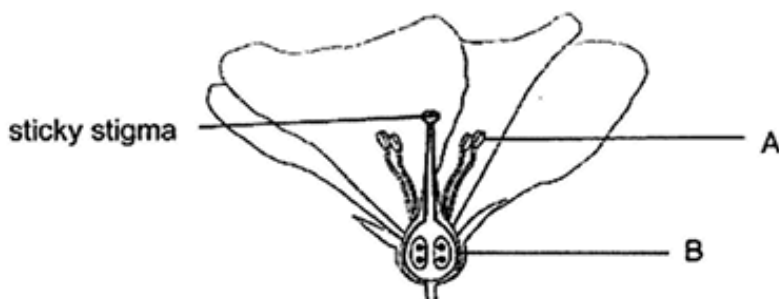


Diagram 1

(c) Based on diagram 1, what is the likely method of seed dispersal of the fruit shown above? Give a reason for your answer. [1]

(d) Based on the information from the diagram 1 and the earlier table, which fruit, X or Y, has the seed dispersal pattern shown above? Explain your answer. [1]

34 The diagram below shows the cross-section of flower H.



(a) What is the function of A in a plant? [1]

(b) What is the advantage of having a sticky stigma in the process of pollination? [1]

(c) How would the removal of part B affect flower H? Explain your answer. [1]

- 35 Cindy wanted to find out if the strength of an electromagnet is affected by the number of coils of wire around an iron rod. She conducted an experiment using four set-ups, A, B, C and D.

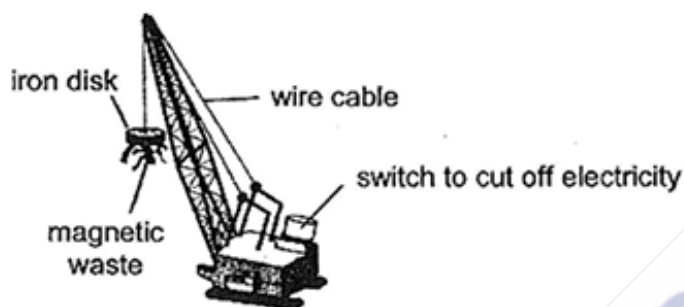
The experimental conditions and results are as shown below.

Set-up	A	B	C	D
Number of batteries	3	2	2	3
Number of coils of wire around iron rod	30	40	10	40
Number of paper clips attracted	10	10	5	16

- (a) Which two set-ups should Cindy compare for her experiment? [1]

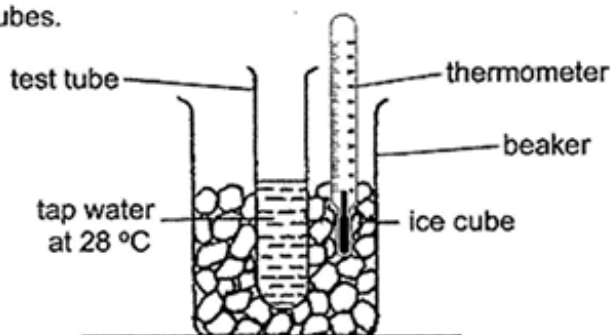
- (b) Comparing set-ups B and D, what is the relationship between the number of batteries used and the strength of an electromagnet? [1]

- (c) Electromagnets are commonly used in sorting out magnetic waste from non-magnetic materials. One such example is as shown below.

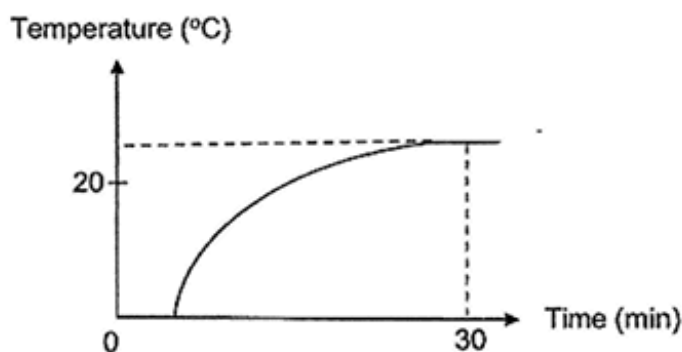


Why is an electromagnet used instead of a normal powerful magnet in sorting out magnetic waste? [1]

- 36 Macy carried out an experiment by placing a test tube of tap water at 28°C into a beaker of ice cubes.



She then plotted a graph showing the change in temperature of the beaker of ice cubes over time as shown below.

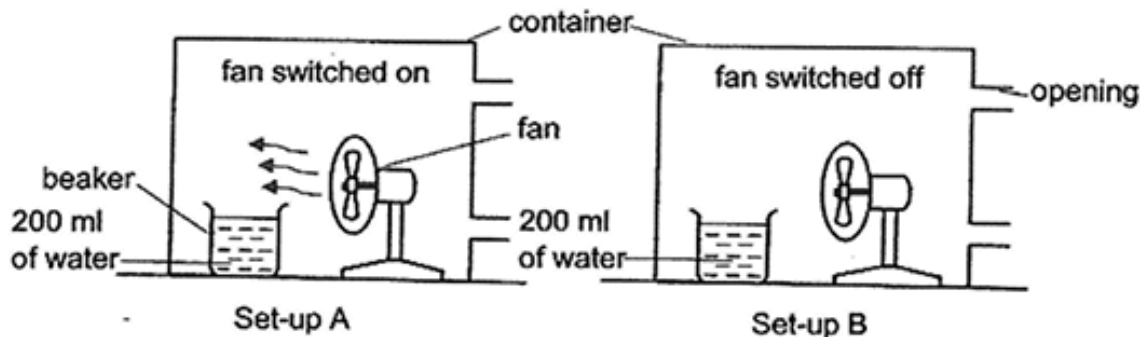


- (a) Explain why the tap water became cooler when placed into the beaker of ice cubes. [1]

- (b) Based on the information above, state a possible room temperature where Macy carried out her experiment. [1]

- (c) Macy's teacher suggested that she should use crushed ice instead of ice cubes to cool the tap water more quickly. Explain how her teacher's suggestion works. [1]

- 37 Shi Chen carried out an experiment using set-up A and set-up B as shown below. The fan in set-up A was switched on during the experiment but the fan in set-up B was not.



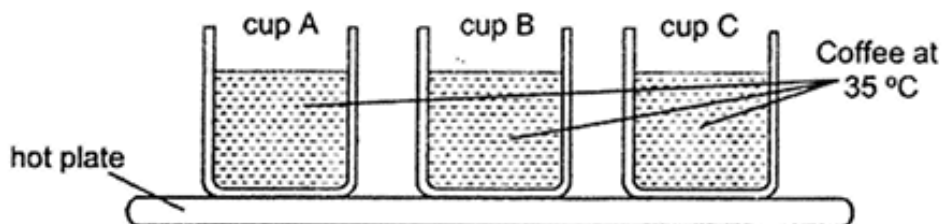
After three hours, she recorded the amount of water left in each beaker.

- (a) In which set-up, A or B, would **less** water be left in the beaker? Explain your answer. [2]

- (b) State the aim of Shi Chen's experiment. [1]

- (c) What was the purpose of the container in the experiment? [1]

- 38** Kavi wanted to find out which material was most suitable to keep his coffee warm for the longest period of time. He placed three cups, A, B and C, of different materials, containing the same amount of coffee of the same temperature (35°C) on a hot plate.



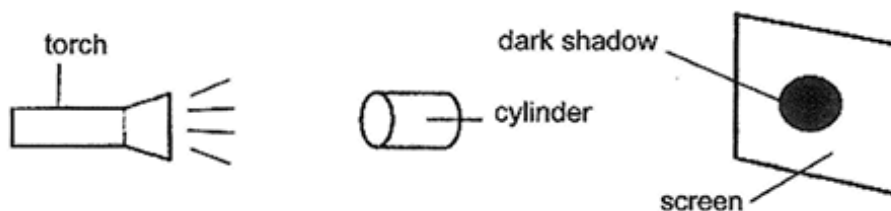
He measured the temperature of the coffee in each cup after five minutes and recorded the results in the table below.

Temperature of coffee ($^{\circ}\text{C}$) after 5 minutes		
Cup A	Cup B	Cup C
40	60	50

- (a) Arrange the three cups, A, B and C, according to their ability to conduct heat beginning with the best to the poorest conductor of heat. [1]

- (b) Should Kavi use cup B to keep his hot coffee warm for the longest period of time? Explain your answer. [2]

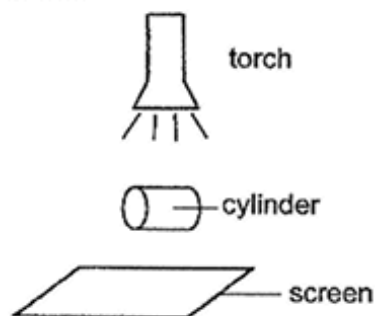
- 39 Gordon set up an experiment using a torch and a cylinder to cast a dark shadow on a screen as shown in the diagram below.



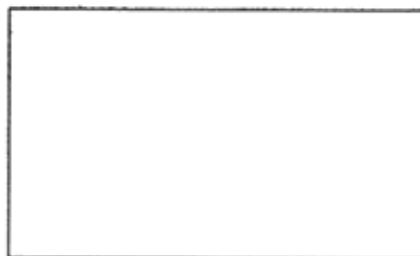
- (a) Without adding or removing any items in the set-up above, what could Gordon do to get a bigger shadow? [1]

- (b) Based on the diagram above, describe the transparency of the cylinder. [1]

Gordon made some changes to his original set-up. He changed the position of the torch and screen as shown.

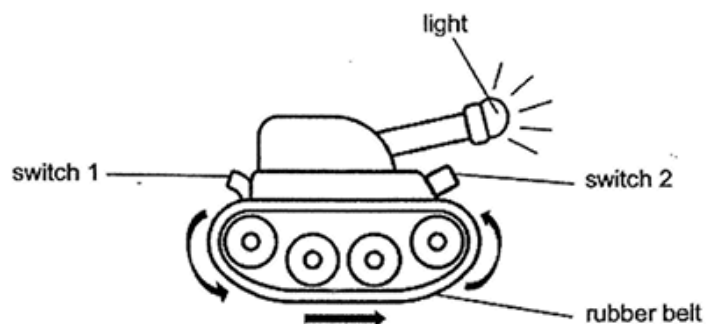


- (c) In the box below, draw the shadow that Gordon would observe on the screen. [1]



(Go on to the next page)

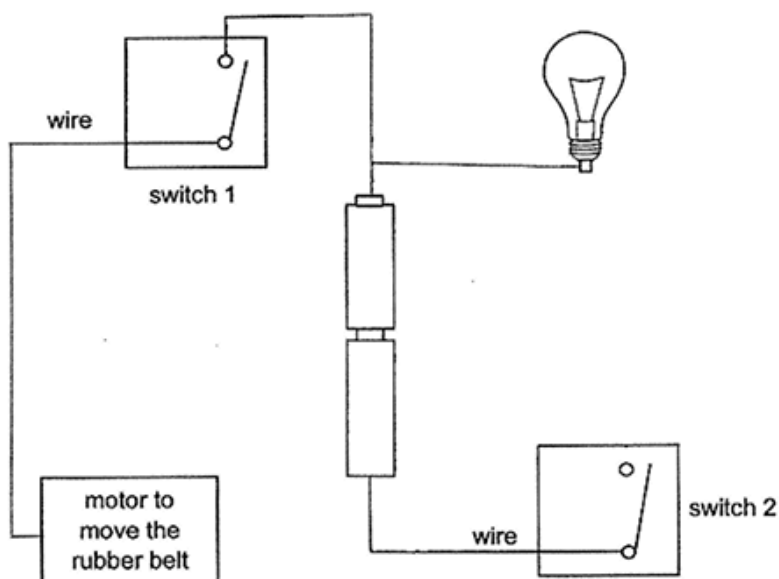
40 Arif has a toy tank which works on batteries.



He plays with the toy tank and records his observations below.

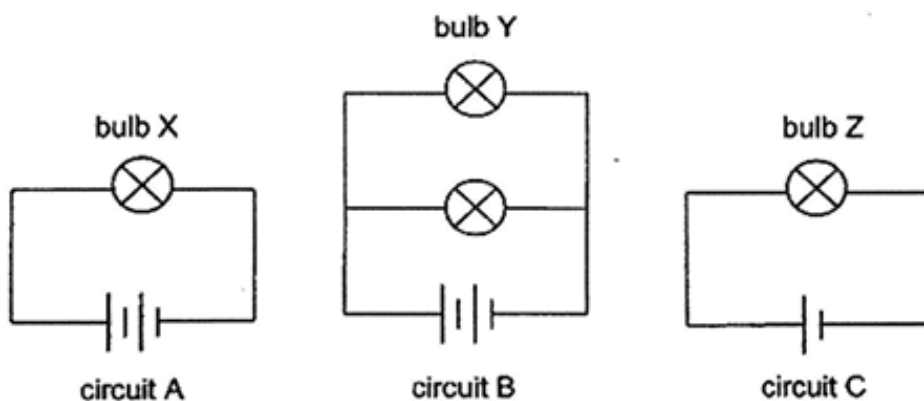
Switch(es) turned on	Observations
Switch 1 only	Rubber belt moves
Switch 2 only	Light lit up
Switches 1 and 2	Light lit up and rubber belt moves

- (a) Based on the information above, complete the electric circuit below to show how Arif's toy tank could have been connected. [2]



- (b) If the light bulb in the toy tank fuses, will the rubber belt still be able to move? Explain your answer. [1]

- 41** Study the three electrical circuits, A, B and C, below. All the bulbs and batteries used are identical and are in good working condition.



- (a)** Write down 'True' or 'False' beside each statement in the given boxes below. [2]

Statement	True or False
(i) Bulb Z is the dimmest among all the bulbs.	
(ii) Bulb X is brighter than bulb Y.	

- (b)** If one more bulb is added in series to circuit C, how will the brightness of bulb Z be affected? [1]

~ End of Paper ~

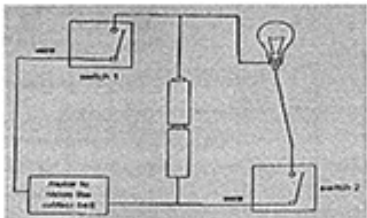
ANSWER SHEET

Q1	2	Q15	3
Q2	4	Q16	3
Q3	4	Q17	1
Q4	2	Q18	2
Q5	4	Q19	4
Q6	2	Q20	4
Q7	3	Q21	3
Q8	1	Q22	2
Q9	2	Q23	3
Q10	4	Q24	4
Q11	4	Q25	4
Q12	3	Q26	1
Q13	2	Q27	4
Q14	3	Q28	1

Q29	<p>a) X: food carrying tube Y: water carrying tube</p> <p>b) The plant will die as it has no food-carrying tube(s) to transport food from the leaves to others/all parts of the plant.</p> <p>c) The water-carrying tube(s) transports water and mineral salts/minerals/nutrients from the root to other/all parts of the plant.</p>
Q30	<p>a) Fish: Q Human: S</p> <p>b) The blood will absorb/take in oxygen from the lungs and remove/release carbon dioxide at/into the lungs. OR At the lungs, the blood absorbs oxygen and releases carbon dioxide. OR At the lungs, the blood exchange carbon dioxide for oxygen.</p> <p>c) Water containing (dissolved) oxygen will enter the mouth and pass through the gills/gill filament where the (dissolved) oxygen will be absorbed into the bloodstream.</p>

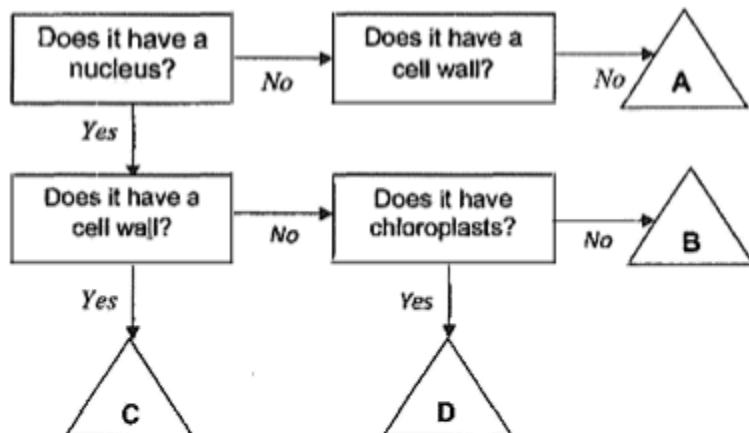
	<p>OR</p> <p>Water will enter the mouth. Dissolved oxygen in water will be absorbed into the blood at the gills.</p>															
Q31)	<p>a)</p> <table border="1"><tr><td>Type of cell</td><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>Check cell</td><td></td><td>√</td><td></td><td></td></tr><tr><td>Leaf cell</td><td></td><td></td><td></td><td>√</td></tr></table> <p>b) Cell C. It does not contain / have chloroplast(s) to trap sunlight / light to make food.</p> <p>c) Cell B has a nucleus but Cell A does not.</p>	Type of cell	A	B	C	D	Check cell		√			Leaf cell				√
Type of cell	A	B	C	D												
Check cell		√														
Leaf cell				√												
Q32)	<p>a) S: egg cell / egg</p> <p>T: sperm</p> <p>b) Fertilisation. During fertilisation, the male's sperm / reproductive cell fuses with / fertilises the female's egg / egg cell.</p> <p>c) The young develops in the womb of the female's body / mother.</p>															
Q33)	<p>a) Seed W is dispersed by animals.</p> <p>b) Being juicy and fleshy will attract the animals to eat the fruit. The (big) undigested seeds will either be thrown away / pass out in droppings after some distance.</p> <p>c) By water. The young plants are growing along the river.</p> <p>d) Fruit X. Fruit X has a fibrous husk which has air space / which traps air. The air space helps it to float in water. The seeds will germinate along the river.</p>															
Q34)	<p>a) Part A produces for stores pollen grains.</p> <p>b) The stigma can trap and hold the pollen grains dispersed (by the animals).</p> <p>c) Fertilisation will not take place and the ovary / flower will not develop into a fruit.</p> <p>OR</p> <p>Flower X cannot reproduce as the ovary / flower cannot develop into a fruit.</p>															
Q35)	<p>a) A and D OR B and C</p>															

	<p>b) As the number of batteries used increased / decreased and the strength of an electromagnet increased / decreased.</p> <p>c) An electromagnet can lose its magnetism easier / faster by opening a switch / cutting off the electricity supply to release the attracted magnetic waste for complete separation.</p> <p>OR</p> <p>An normal magnet cannot lose its magnetism easier / faster to release the attracted magnetic waste for complete separation.</p>
Q36)	<p>a) The tap water loses heat to the beaker of ice cubes.</p> <p>b) Accept more than 20°C and less than or equal to 28°C i.e 21°C , 22°C , 23°C , 24°C , 25°C , 26°C , 27°C , 28°C</p> <p>c) Crushed ice has a greater / increased exposed surface area in contact with (the test tube of) the tap water to allow faster / more heat lost by the tap water to the ice.</p>
Q37)	<p>a) C: Set-up A</p> <p>E: Only the fan in set-up A was switched on.</p> <p>C: More wind / greater air movements is present in set-up A to increase the rate of evaporation of water.</p> <p>L: Hence, less water will be observed in the beaker of set-up A.</p> <p>b) To find out if the presence / amount of wind affects the rate of evaporation of water.</p> <p>OR</p> <p>To find out if the presence / amount of wind affects the amount of water left in a beaker.</p> <p>c) The container reduced wind in the surrounding from entering the set-ups so that Shi Chen can be sure that the results of his experiment is only due to the presence of wind generated by the fan.</p>
Q38)	<p>a) B , C , A</p> <p>b) C: No</p> <p>E: Cup B is at the highest temperature after 5 mins / Cup B gains the most heat from the hot plate.</p> <p>C: Cup B will gain most heat from the coffee / gain heat from the coffee fastest.</p>

	<p>L: and lose most of the heat to the surrounding air / and lose the heat to the surrounding air fastest.</p> <p>OR</p> <p>C: No</p> <p>E: Cup B is at the highest temperature after 5 mins / Cup B gains the most heat from the hot plate.</p> <p>C: Cup B is the best conductor of heat.</p> <p>L: and will conduct most heat from the coffee to the surrounding air/ and will conduct heat from the coffee to the surroundings the fastest.</p>
Q39)	<p>a) Any one of the below.</p> <p>Move the cylinder closer to the touch.</p> <p>Move the cylinder further from the screen.</p> <p>Move the torch closer to the cylinder / screen.</p> <p>Move the screen further from the cylinder / torch.</p> <p>b) translucent / allows some light to pass through it.</p> <p>opaque / allows no light to pass through it.</p> <p>c)</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; width: 40px; height: 40px; background-color: #cccccc; margin-right: 10px;"></div> or <div style="border: 1px solid black; width: 40px; height: 40px; background-color: #cccccc; margin-left: 10px;"></div> </div>
Q40)	<p>a)</p>  <p>b) Yes. The motor and the bulb are connected in a parallel arrangement, electric current can still pass the motor / flow through the motor when the bulb fuses to move the rubber belt.</p>
Q41)	<p>a) i) True ii) False</p> <p>b) Bulb Z will become dimmer / The brightness of bulb Z decreased.</p>

NAN HUA PRIMARY SCHOOL WA1 PAPER

- 1 The flow chart below shows the differences in cells A, B, C and D.



Based on the flow chart, which cell is most likely taken from a plant?

- (1) A
- (2) B
- (3) C
- (4) D

()

2 Mel recorded the following statements below.

A: A tissue is made up of organs.

B: A cell is the smallest unit of life.

C: Living things are made up of one or more cells.

D: Larger organisms have bigger cells than smaller organisms.

Which of the above statements are true?

(1) A and B only

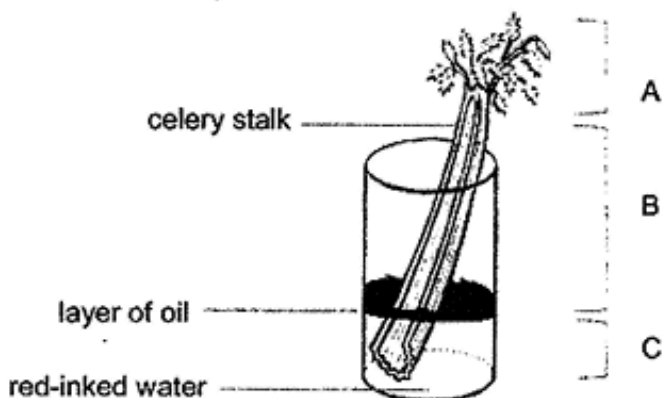
(2) A and C only

(3) B and C only

(4) C and D only

()

3 The diagram below shows a celery stalk in a beaker of red-inked water. A, B and C show the 3 sections of the celery stalk.



After three days, there was no more red-inked water remaining in the cup. Which section(s) of the celery stalk would have turned red?

(1) A only

(2) C only

(3) B and C only

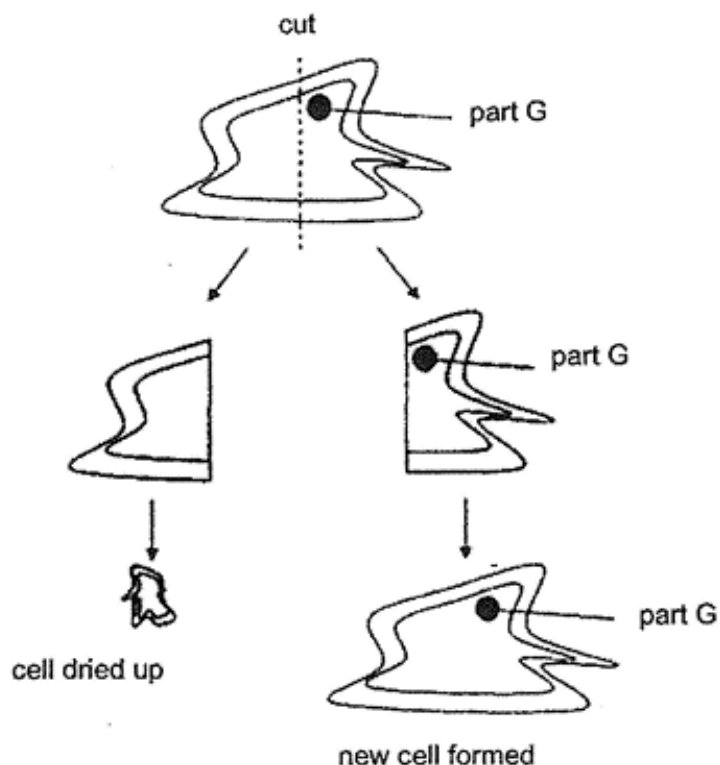
(4) All of the above

()

- 4 Jane observed cell X under a microscope and drew it as shown below.



Using a special laboratory equipment, she cut the cell into two and found that one half of the cell grew to form a new cell while the other half dried up, as shown below.

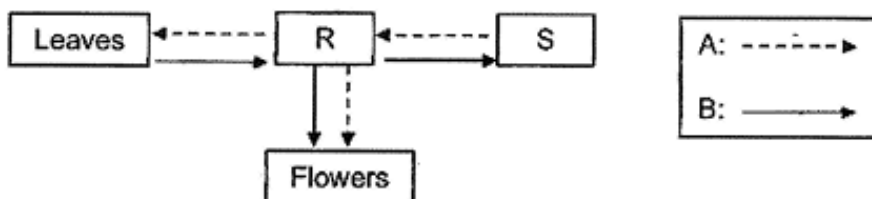


From her experiment, what can she conclude about part G?

- (1) It allows the cell to trap light and make food.
- (2) It allows substances to move around within the cell.
- (3) It allows the cell to regrow and repair parts of the cell.
- (4) It controls the movement of substances in and out of the cell.

()

- 5 The diagram below shows how substances, A and B, are transported in a plant. The arrows represent the movement of the substances. R and S are different parts of the plant.



What do A, B, R and S represent?

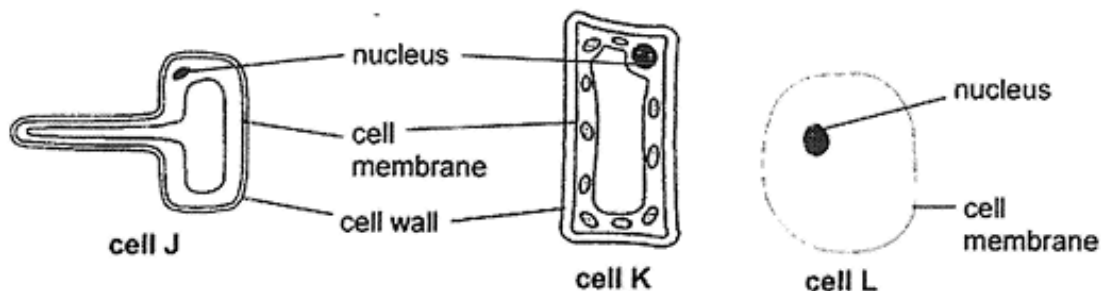
	Substance A	Substance B	R	S
(1)	water	food	roots	stem
(2)	water	food	stem	roots
(3)	food	water	roots	stem
(4)	food	water	stem	roots

()

Section B: Structured questions (10m)

For questions 6 to 8, write your answers in the space provided. The number of marks available is shown in brackets [] at the end of each question or part question.

- 6 John conducted an experiment to find out what happens when cells absorb too much water. The diagram below shows the three cells he used.



All three cells were placed in water for 5 minutes to absorb as much water as possible. After 5 minutes, John recorded his observations in the table below.

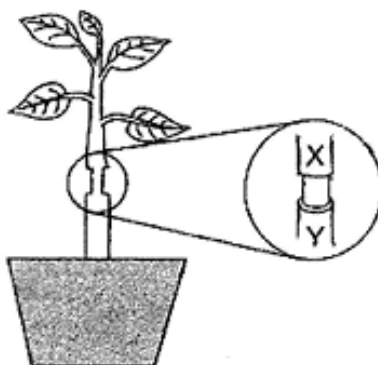
Cell J placed in water	Cell K placed in water	Cell L placed in water
The cell stiffens but maintains its regular shape.	The cell stiffens but maintains its regular shape.	The cell bursts and loses its shape.

- (a) Explain the difference in the observations of cells J, K and L after 5 minutes in water. [1]

- (b) Which cell was taken from a leaf? Explain your answer. [1]

- (c) Cells J and K were taken from the same plant? Why did the cells taken from different parts of the same plant have different shapes? [1]

- 7 Sam cut an outer ring of the stem between positions X and Y of a plant as shown below.



He placed his plant by the window and watered it daily for one week.
 After a few days, he noticed that position X was swollen.

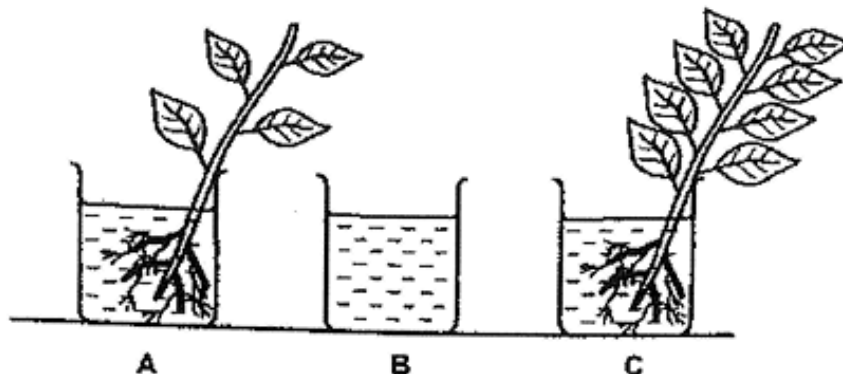
- (a) Which part of the plant transport system was removed when he cut the outer ring? [1]

- (b) Write in the boxes below to state if the following statements about the plant above are 'True' or 'False'. [1]

Statement	True/False
The leaves could not make food.	
The stem could transport water to the leaves.	

- (c) After one week, the plant died. Explain why. [1]

- 8 Siv wanted to find out how the numbers of leaves in a plant affects the amount of water taken in by the plant. He filled three identical beakers with the same amount of water and placed plants in two of them. He kept the type and height of the plants the same as shown in the diagram below.



He recorded the amount of water in each beaker at the start and end of the experiment.

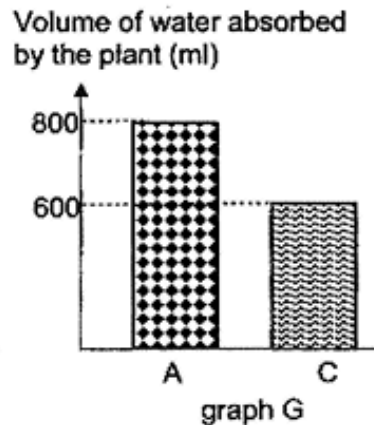
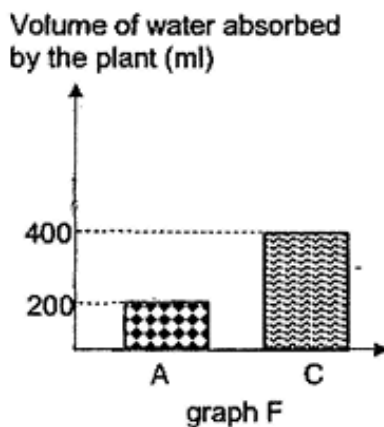
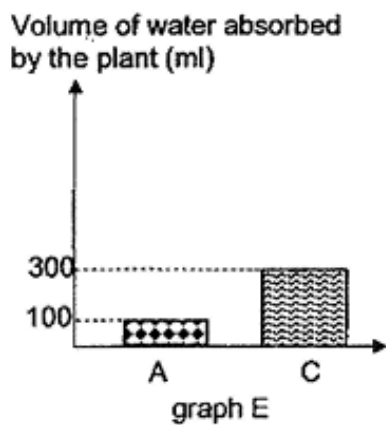
	Set-up A	Set-up B	Set-up C
Volume of water at the start of the experiment (ml)	1000	1000	1000
Volume of water at the end of the experiment (ml)	800	900	600

- (a) State the dependant variable (measured) in this experiment. [1]

- (b) State one other variable he needed to keep constant for the experiment. [1]

- (c) Explain the purpose of set-up B. [1]

Siv plotted a graph to show the amount of water absorbed by the two plants during the experiment.



- (d) Based on the information shown in the table on page 7, which graph, E, F or G, correctly represents the volume of water absorbed by the plants in set-ups A and C? [1]

Score	4
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~ End of Paper ~

ANSWER SHEET

SECTION A

Q 1	Q2	Q3	Q4	Q5
3	3	4	3	2

SECTION B

Q6)	<p>a) Cell J and K had cell walls to maintain their shape whereas Cell L burst when it absorbed too much water.</p> <p>b) Cell K was taken from a leaf as it has a cell wall and chloroplasts which trap sunlight to make food.</p> <p>c) Cell J and K have different shapes to perform their different functions efficiently.</p>		
Q7)	<p>a) The food – carrying tube</p> <p>b)</p> <table border="1"><tr><td>False</td></tr><tr><td>True</td></tr></table> <p>c) Food from the leaves could not be transported to parts of the plant below position X and these parts, including the roots, will not be able to function, causing the plant to die.</p>	False	True
False			
True			
Q8)	<p>a) Volume of water at the end of the experiment.</p> <p>b) Location of all 3 set-ups / amount of roots in the plants in A and C.</p> <p>c) So that Sir knows how much water was lost through evaporations and then calculate how much water was taken in by the plant.</p> <p>d) Graph E</p>		

NAN HUA PRIMARY SCHOOL WA2 PAPER

Section A: (5 x 2 marks = 10 marks)

For each question from 1 to 5, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4) and write your answer in the bracket provided.

1 Which of the following gases are present in exhaled (breathed out) air?

- A Oxygen
- B Nitrogen
- C Water vapour
- D Carbon dioxide

- (1) D only
- (2) C and D only
- (3) B, C and D only
- (4) A, B, C and D

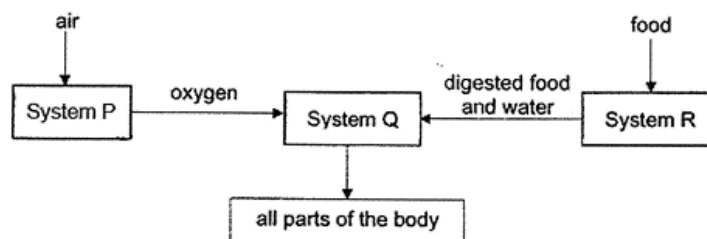
()

2 Which of the following identifies the part or organ through which air leaves a human, fish and plant?

	Human	Fish	Plant
(1)	mouth	mouth	tiny opening on leaves
(2)	mouth	gills	root hairs
(3)	nose	gills	tiny opening on leaves
(4)	nose	mouth	root hairs

()

3 Study the three systems P, Q and R in a human body below.

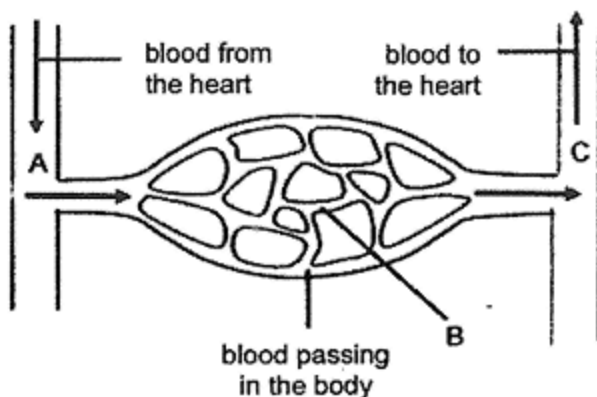


Which of the following statements about the three human body systems are correct?

- A System R breaks down food into simpler substances.
- B System P pumps blood rich in oxygen to System Q and all parts of the body.
- C System Q transports oxygen, digested food and water to all parts of the body.
- D Systems P, Q and R do not depend on one another for the human body to stay healthy.

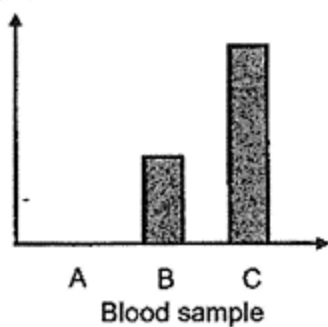
- (1) A and B only
- (2) A and C only
- (3) B, C and D only
- (4) All of the above

- 4 The diagram below shows the flow of blood in the human circulatory system.

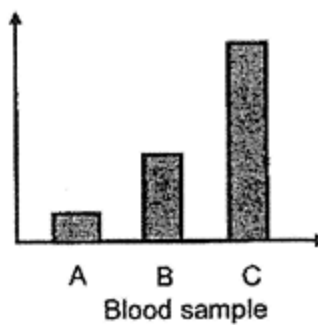


The same amount of blood samples was taken from A, B and C.
Which chart shows the correct comparison of the amount of carbon dioxide in the blood samples?

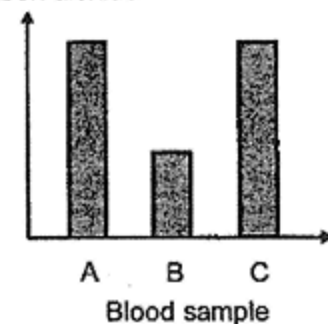
(1) Amount of carbon dioxide



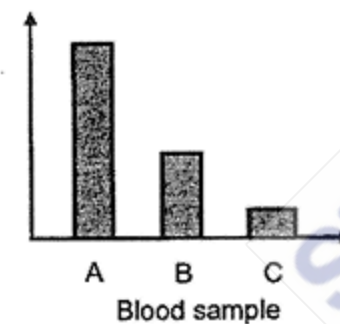
(2) Amount of carbon dioxide



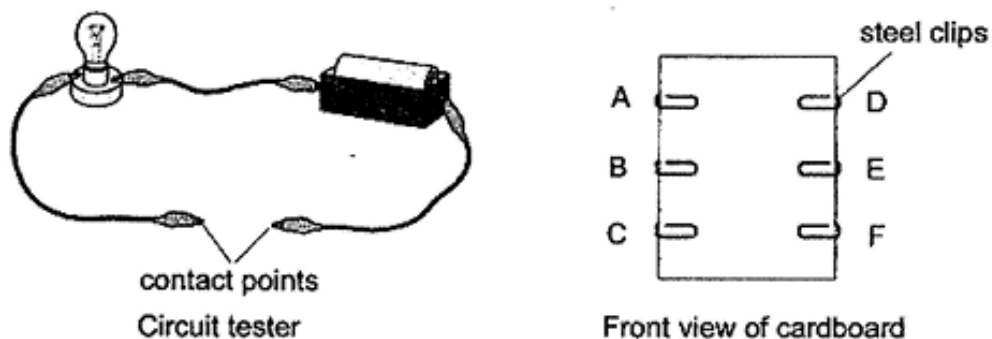
(3) Amount of carbon dioxide



(4) Amount of carbon dioxide



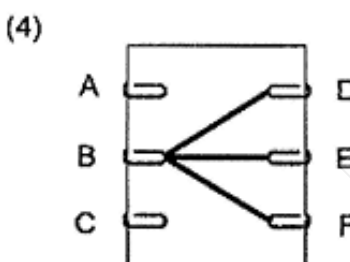
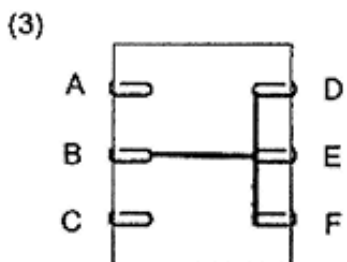
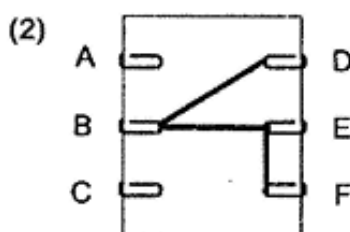
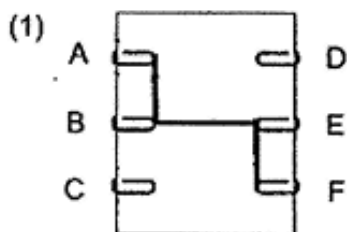
- 5 The set-up below shows a circuit tester and a piece of cardboard with six steel clips. The steel clips are connected to some copper wires at the back of the cardboard.



The table below shows the results when the circuit tester is connected to the following pairs of steel clips.

Steel clips	Does the bulb light up?
A and D	No
B and E	Yes
B and F	Yes
C and F	No
D and F	Yes

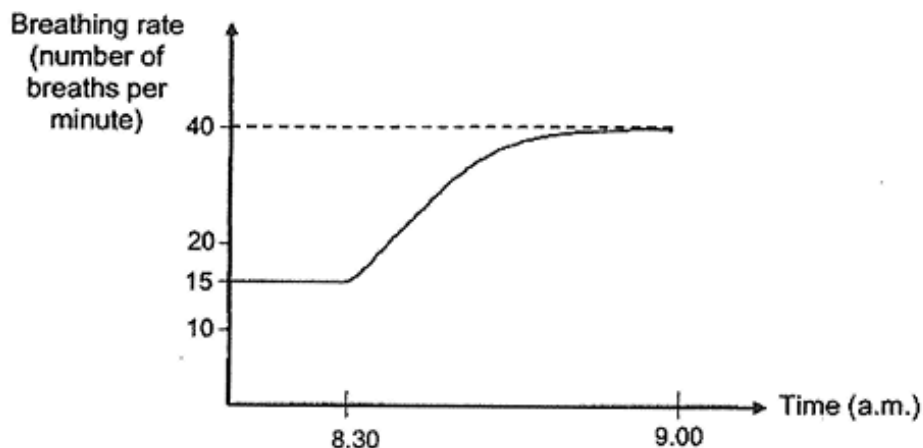
Which of the following is **not** a possible connection of copper wires to the steel clips at the back of the cardboard?



Section B: Structured questions (10m)

For questions 6 to 8, write your answers in the space provided. The number of marks available is shown in brackets [] at the end of each question or part question.

- 6 Timothy went jogging from 8.30 a.m. to 9.00 a.m. He wore a fitness tracker to monitor his breathing rate before and during his jog. The graph below shows his breathing rate.

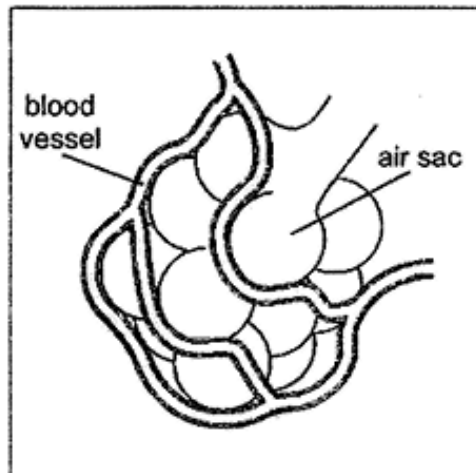


- (a) Explain the change in Timothy's breathing rate before and during his exercise. [1]

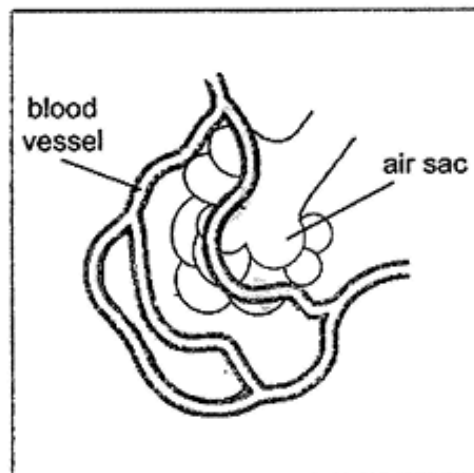
Air sacs are found at the end of the tiny branches of air tubes in the lungs and surrounded by blood vessels.

Timothy fell ill with a lung disease a month later. The disease caused some of his air sacs to shrink as shown in the diagrams below.

Before illness



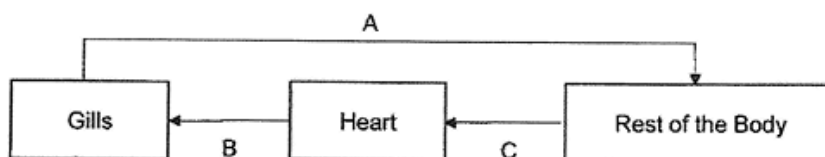
After illness



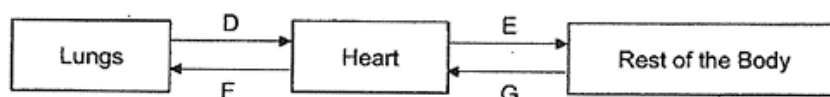
- (b) Based on the diagrams, explain how the damaged air sacs led to a decrease in oxygen level in his blood. [2]

- 7 The diagrams below show how gases are transported in the circulatory systems of a fish and a human. A, B, C, D, E, F and G are blood vessels in the different parts of the bodies. The arrows represent the movement of blood.

Circulatory System of a Fish



Circulatory System of a Human



- (a) Name the blood vessels, A, B, C, D, E, F or G, containing the most amount of oxygen in the fish and in the human. [1]

(i) In the fish: _____

(ii) In the human: _____

- (b) Using the diagrams above, describe clearly how carbon dioxide produced by the cells of a human is removed from his body. [2]

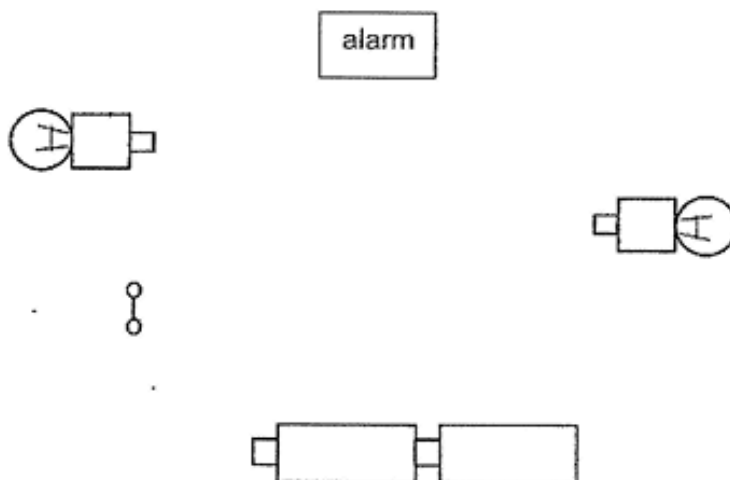
- (c) Write 'True' or 'False' beside each statement below. [1]

Statement	True or False
(i) Blood rich in oxygen that leaves the gills goes straight to all parts of the fish's body.	
(ii) Plants, like human, have tubes in their circulatory system to transport digested food to all its cells.	

- 8 The diagram below shows a toy police car. When it is switched on the bulbs light up and the alarm sounds off at the same time.



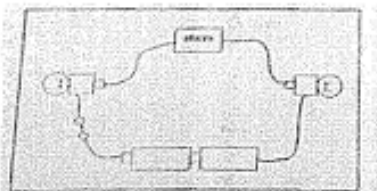
- (a) Complete the circuit diagram below to show the arrangement of the wires in the toy car when the bulbs are lit and alarm sounds off. [2]



- (b) Will the alarm still produce the sound when one of the bulbs fuses? [1]
 Explain your answer.

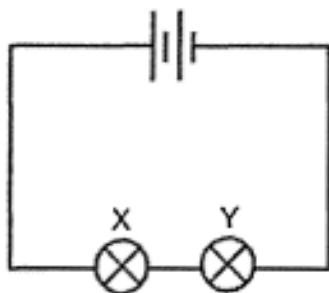
ANSWER SHEET

Q 1	Q2	Q3	Q4	Q5
4	3	2	2	1

Q6)	<p>a) During exercise, Timothy's breathing rate increased / became faster to take in more oxygen (and remove more carbon dioxide) for a faster rate of respiration / to release more energy.</p> <p>b) The shrunken / damaged air sacs reduced the exposed surface area of the oxygen in contact with the blood in the blood vessels. Hence less oxygen can enter / pass / be absorbed into the blood.</p> <p>OR</p> <p>As air sacs shrunken, the lungs' capacity / volume decreased. Less oxygen is present in the lungs. Hence less oxygen can enter / pass / be absorbed into the blood.</p>
Q7)	<p>a) i) A ii) D</p> <p>b) Carbon dioxide leaves the cells and enters into the blood / bloodstream. Carbon dioxide in the blood is then transported to the heart and pumped to the lungs. At the lungs, carbon dioxide is exhaled / removed from the body.</p> <p>c) i) True ii) False</p>
Q8)	<p>a)</p> <div style="text-align: center;">  </div> <p>b) The alarm will not sound. When a bulb fuses, there is an open circuit / a gap in the circuit. Electric current cannot flow through the alarm to sound it.</p>

NANYANG PRIMARY SCHOOL EOY PAPER

- 1 The diagram below shows an electric circuit.



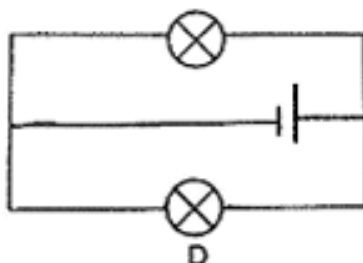
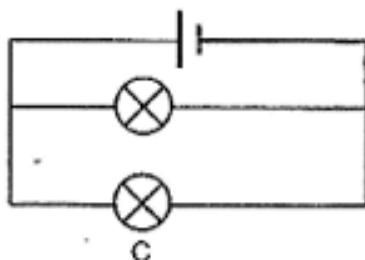
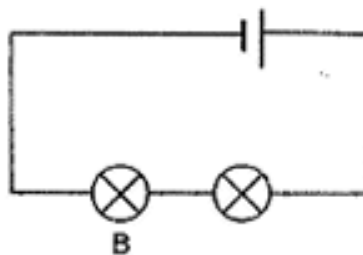
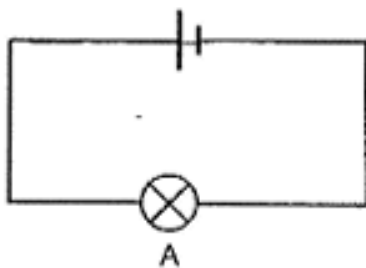
Which of the following action(s) will increase the brightness of bulb X?

- A add a switch to the circuit
- B add another bulb in series
- C remove bulb Y from the circuit

- (1) B only
- (2) C only
- (3) B and C only
- (4) A, B and C

()

- 2 Study the four circuits below. All the batteries and bulbs are identical. All the bulbs are lit.



Which of the following correctly compares the brightness of bulbs A, B, C and D?

- (1) Bulb A is as bright as bulb B.
- (2) Bulb A is as bright as bulb D.
- (3) Bulb B is brighter than bulb C.
- (4) Bulb C is dimmer than bulb D.

()

- 3 Keith made four statements, W, X, Y and Z, about reproduction in plants.

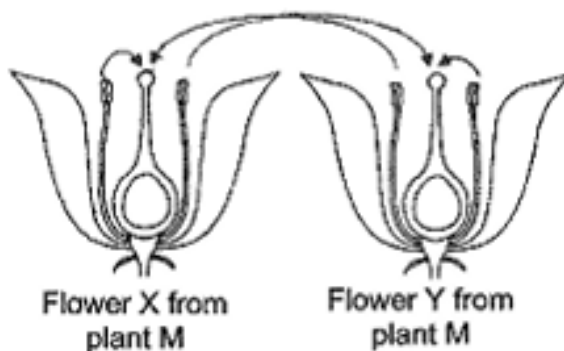
- W All plants reproduce from seeds.
- X Reproduction ensures the continuity of their own kinds.
- Y Fertilisation involves the fusion of the male and female reproductive cells.
- Z Reproduction allows the passing on of characteristics from parent plants to their young.

Which of the following statements are correct?

- (1) Y and Z only
- (2) W and X only
- (3) X, Y and Z only
- (4) W, X, Y and Z

()

- 4 The diagram below shows pollination taking place in flowers X and Y of plant M.



Based on the diagram above, which of the following statement is correct?

- (1) Pollination cannot take place within the same flower.
- (2) Pollination is the transfer of ovules from the anther to the stigma.
- (3) Pollination can take place between two flowers of the same plant.
- (4) Pollination is the transfer of pollen grains from the stigma to the anther. ()

- 5 Diagram A below shows part of an island where three plants, Q, R and S are growing.

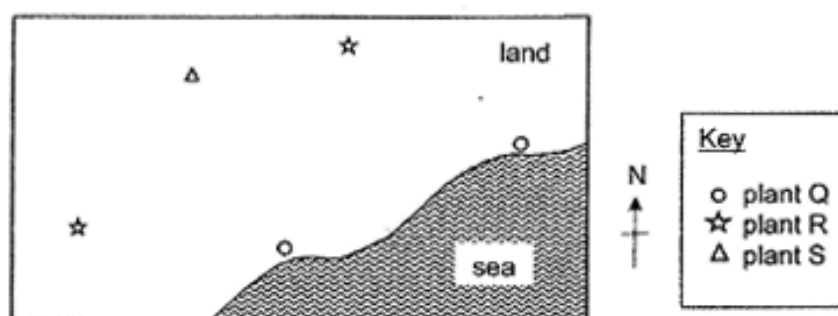


Diagram A

The wind direction is northwards throughout the year. Six months later, more of the three types of plants are found growing at different parts of the island as shown in Diagram B.



Diagram B

Based on the information given above, how are the fruits or seeds of plants Q, R and S most likely to be dispersed by?

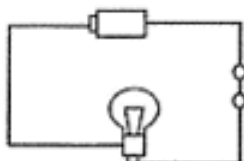
	Q	R	S
(1)	wind	animals	water
(2)	water	splitting action	wind
(3)	splitting action	wind	water
(4)	water	splitting action	animals

()

Section B: Structured questions (10m)

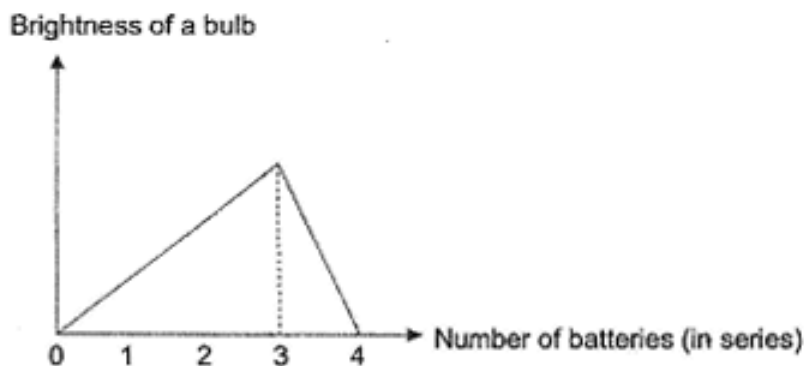
For questions 6 to 8, write your answers in the space provided. The number of marks available is shown in brackets [] at the end of each question or part question.

- 6 Mikkel set up an electric circuit as shown below. He measured the brightness of the bulb.



He repeated the experiment with different number of batteries arranged in series. All batteries and bulb used were in working condition.

The results of his experiment were recorded in the graph below.



- (a) State the aim of Mikkel's experiment. [1]

- (b) The bulb shone the brightest with three batteries. Explain what could have happened to the bulb when the fourth battery was added. [1]

(c) In another experiment, Mikkel set up a different circuit using all of the components below:

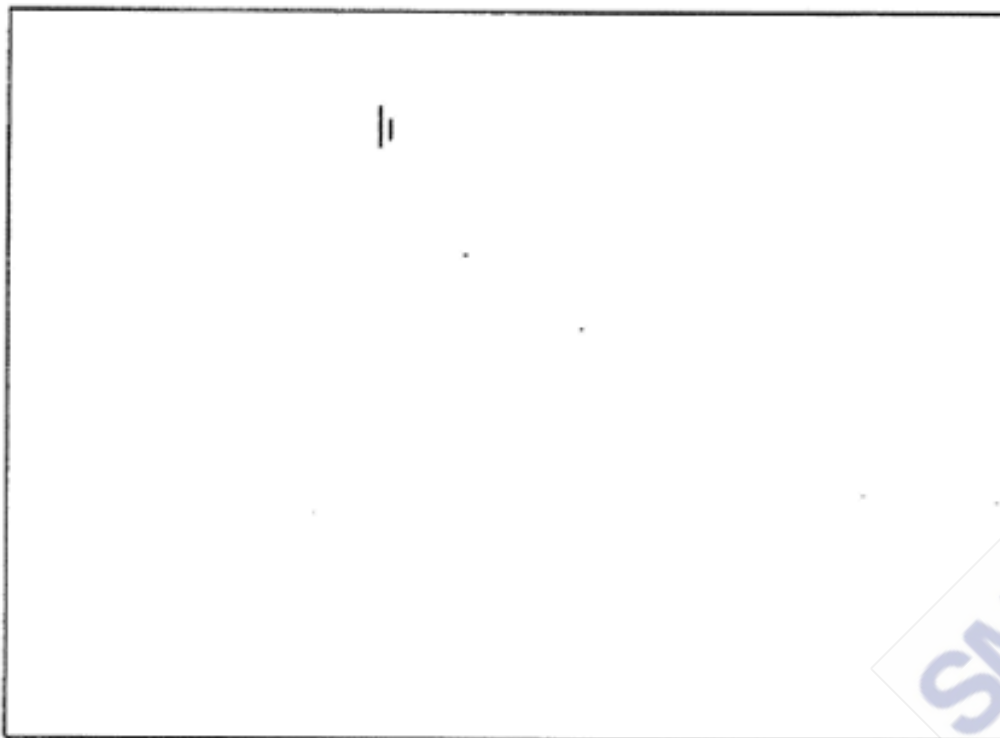
- a battery
- some wires
- two switches (S1 and S2)
- three identical bulbs (A, B and C)

He then recorded which bulb(s) lit up and their brightness in the table below.

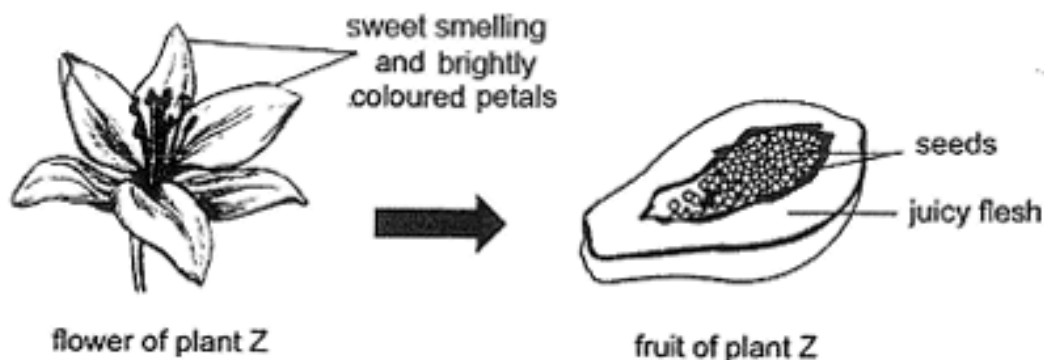
Switches	Bulbs that lit up	Brightness of bulb (units)
S1 open S2 close	C	10 units
S1 close S2 open	A and C	10 units each
S1 close S2 close	A, B and C	10 units each

In the box below, draw a circuit diagram to represent the circuit that Mikkel had constructed. Label the bulbs, A, B and C and switches S1 and S2 in your drawing clearly.

[2]



7 The diagrams below show the flower and fruit of plant Z.



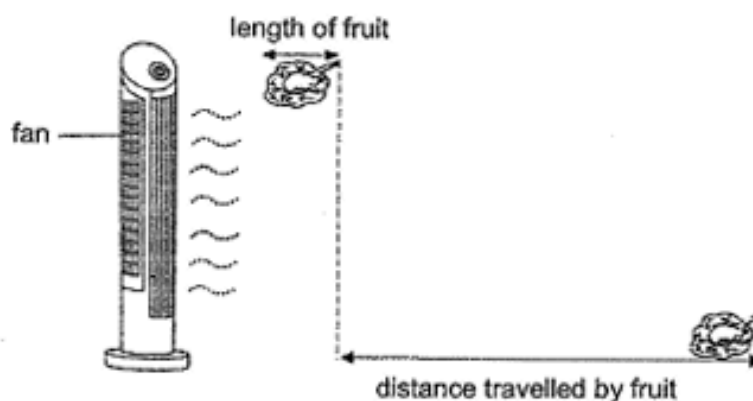
(a) Fill in the blank below. [1]

The flower of plant Z is most likely to be pollinated by _____.

(b) Based on the diagrams above, put a tick (✓) in the box beside each of the following statements to indicate if it is 'True', 'False' or 'Not possible to tell'. [2]

Statements	True	False	Not possible to tell
(i) The seeds are most likely to be dispersed by animals.			
(ii) The flower's ovary contains many ovules.			

- 8 Zoe conducted an experiment to find out if the length of a fruit could affect the distance it travelled when blown by the wind as shown below.



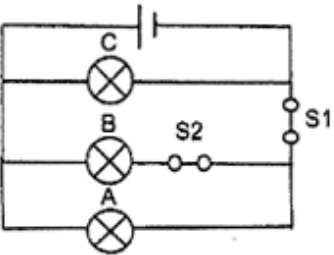
She dropped four similar fruits of different lengths from a fixed height and measured the distance each fruit travelled. She recorded her results in the table below.

Fruit	Length of fruit (cm)	Fan speed	Distance travelled by fruit (cm)
E	5	slow	20
F	6	slow	30
G	7	slow	50
H	4	fast	20

- (a) Based on the results of fruits, E, F and G, what is the relationship between the length of a fruit and the distance it travelled when blown by the wind? [1]
-
-
- (b) Explain why the experiment is no longer a fair test when Zoe increased the fan speed with fruit H. [1]
-
-
- (c) Explain why fruit G will most likely grow into a healthier plant compared to fruit E if both were dispersed by the same parent plant in the wild. [1]
-
-

ANSWER SHEET

2022 P5 Term 3 Sci WA – Pupils' answer sheet

1	2
2	2
3	3
4	3
5	4
6a	To find out if the number of batteries arranged in series affects the brightness of a bulb.
b	When the fourth battery was added, too much electric current flowed through the bulb / circuit and caused the bulb to fuse.
c	
7a	Animals / insects / birds
bi	True
bii	True
8a	As the length of the fruit increases / decreases, the distance it travelled when blown by the wind increases / decreases.
b	By introducing fan speed as another changed / independent variable, it will no longer be a fair test, since the increased / different fan speed will also affect the distance travelled by the fruit.

Or	By introducing fan speed as another changed / independent variable, it will no longer be a fair test, since Zoe will not be sure if the distance travelled by the fruit is affected by the length of the fruit only.
c	Fruit G is dispersed further than fruit E. This reduces seedling G's competition for sunlight / light, space, water and minerals / nutrients with its parent plant and other new seedlings.

NANYANG PRIMARY SCHOOL EOY PAPER

Section A: Multiple Choice Questions [56 marks]

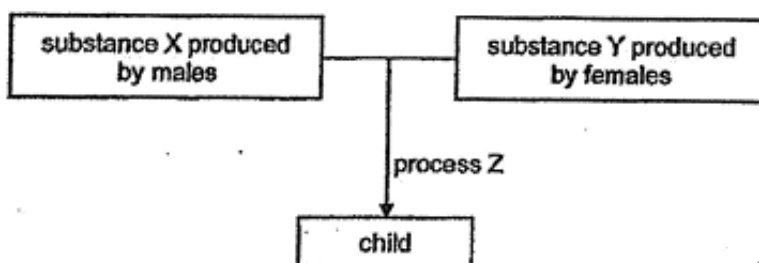
1. Daniel observed that a flower on a plant had turned into a fruit. He then made the following conclusions.

- A Fertilisation had taken place in the flower.
- B The ovule of the flower had developed into a fruit.
- C The ovary of the flower had developed into a seed.

Which of his conclusions is/are correct?

- | | |
|------------------|-------------------|
| (1) A only | (2) A and C only. |
| (3) B and C only | (4) A, B and C |

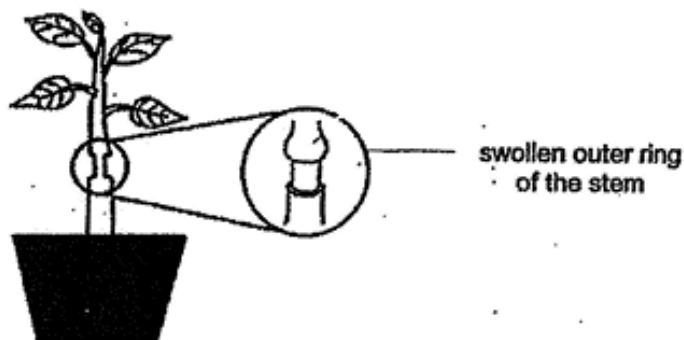
2. Study the diagram below regarding human reproduction.



Which one of the following correctly identifies X, Y and Z?

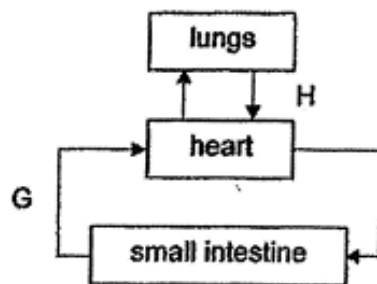
	X	Y	Z
(1)	pollen grain	sperm	fertilisation
(2)	pollen grain	egg	pollination
(3)	sperm	sperm	pollination
(4)	sperm	egg	fertilisation

3. Sam removed the outer ring of the stem of a plant. One week later, he observed the plant and made a drawing of his observation in the diagram shown below.



Which one of the following correctly explains his observation of the stem after one week?

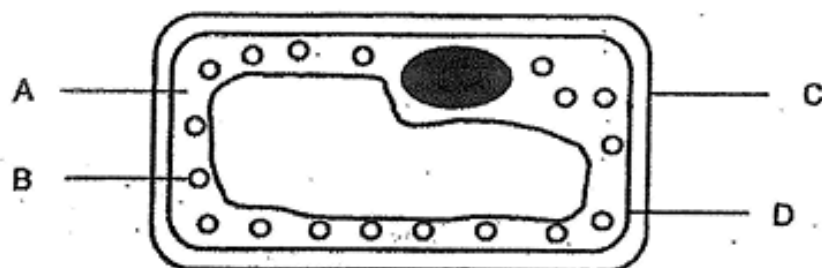
- (1) Food-carrying tubes were cut so food cannot be transported up to the leaves.
 - (2) Food-carrying tubes were cut so food cannot be transported down to the roots.
 - (3) Water-carrying tubes were cut so water cannot be transported up to the leaves.
 - (4) Water-carrying tubes were cut so water cannot be transported down to the roots.
4. The arrows in the diagram below show the flow of blood in a human body system.



Which of the following correctly represent the blood flowing in G and H?

- A There is less oxygen in G than H.
 - B There is more digested food in H than G.
 - C There is less carbon dioxide in G than H.
- (1) A only
 - (2) A and C only
 - (3) B and C only
 - (4) A, B and C

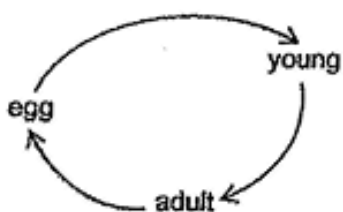
5. The diagram below shows a typical plant cell taken from the leaf of a plant.



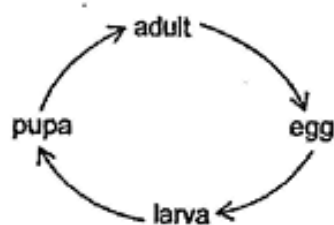
Which part of the cell helps to trap sunlight for making food?

- | | | | |
|-----|---|-----|---|
| (1) | A | (2) | B |
| (3) | C | (4) | D |

6. The diagram below shows the life cycles of animal P and animal Q.



life cycle of animal P

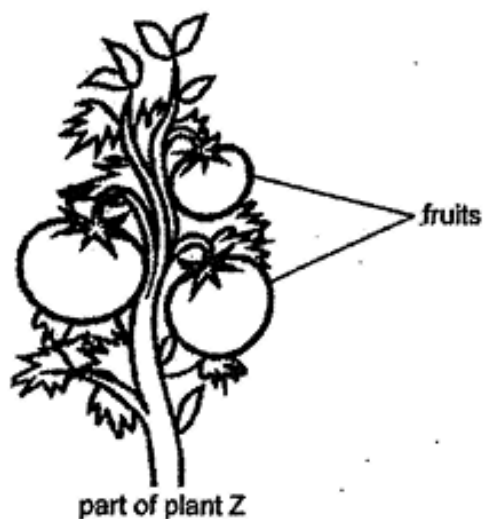


life cycle of animal Q

Based only on the diagram above, which one of the following statements about animals P and Q is definitely correct?

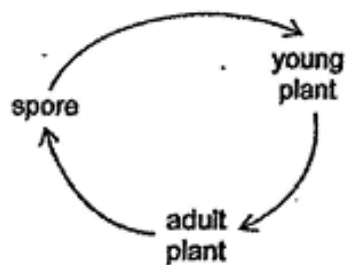
- (1) Both animal P and animal Q lay eggs in water.
- (2) Both the young of animals P and Q resemble its adult.
- (3) Animal Q gives birth to young alive but animal P lays egg.
- (4) Animal P has a 3-stage life cycle and animal Q has a 4-stage life cycle.

7. The diagram below shows part of plant Z.

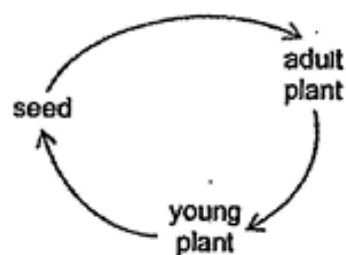


Which one of the following correctly shows the stages in the life cycle of plant Z?

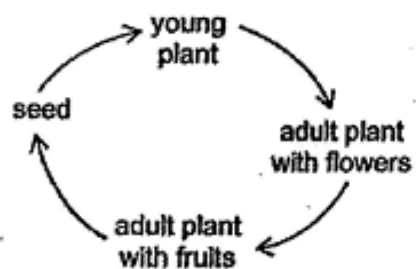
(1)



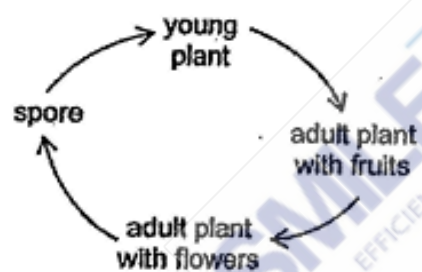
(2)



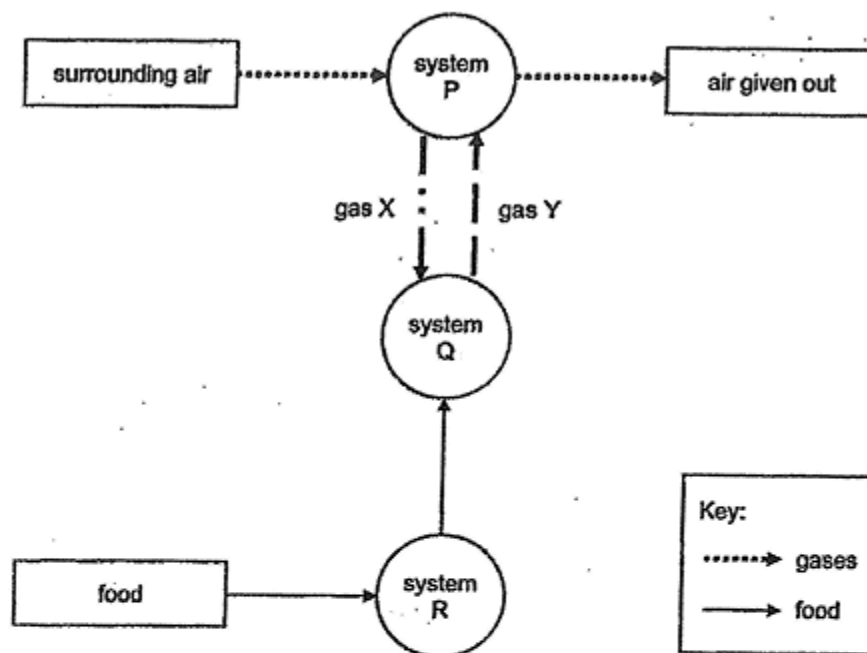
(3)



(4)



8. The diagram below shows how food and various gases are transported in humans.



Based on the diagram above, what do P, Q, R and X represent?

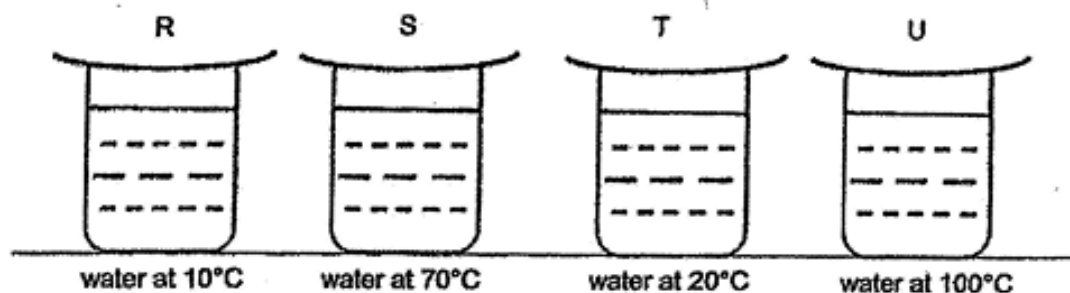
	System P	System Q	System R	Gas X
(1)	circulatory	digestive	respiratory	carbon dioxide
(2)	respiratory	digestive	circulatory	carbon dioxide
(3)	digestive	circulatory	respiratory	oxygen
(4)	respiratory	circulatory	digestive	oxygen

9. Which one of the following statements is **wrong**?
- (1) Digestion of food ends in the large intestine.
 - (2) Food is broken down into smaller pieces in the mouth.
 - (3) Food is transported from the mouth to the stomach through the gullet.
 - (4) Digestive juices in the stomach breaks down food into simpler substances.

10. Water can exist in three states.
Which one of the following are correct examples of the different states of water?

	Solid	Liquid	Gas
(1)	snowflakes	clouds	water vapour
(2)	snowflakes	steam	clouds
(3)	clouds	water vapour	steam
(4)	icebergs	water droplets	clouds

11. The diagram below show 4 similar beakers, R, S, T and U, each filled with 100ml of water at different temperatures. Each beaker was covered with a similar lid and was placed on the table at room temperature of 30°C.



Which of the beakers would have water droplets forming on the outer surface of the beaker after some time?

- | | |
|------------------|------------------|
| (1) R and S only | (2) R and T only |
| (3) S and U only | (4) T and U only |
12. Which of the following is **wrong** regarding the water cycle?
- A When the temperature of the environment increases, the rate of evaporation increases.
- B When the temperature of the environment increases, the rate of evaporation decreases.
- C When water vapour rises up to the cooler sky, it loses heat and condenses into water droplets.
- | | |
|------------------|------------------|
| (1) B only | (2) A and C only |
| (3) B and C only | (4) A, B and C |

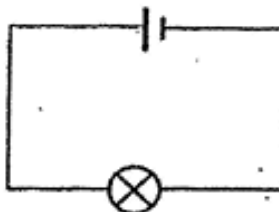
13. The diagram below shows some floating plastic balls released into a reservoir to prevent the reservoir from drying up during long periods of hot weather.



Which of the following correctly shows how the plastic balls slow down the rate of evaporation?

- (1) They increase the exposed surface area of the reservoir.
 - (2) They decrease the exposed surface area of the reservoir.
 - (3) They increase the temperature of the water in the reservoir.
 - (4) They decrease the temperature of the water in the reservoir.
14. Which of the following activities could have caused an increase in water pollution?
- A Increase in the number of oil spills
 - B Releasing waste from factories into the river
 - C Treating sewage before releasing into water bodies
- (1) A only
 - (2) A and B only
 - (3) B and C only
 - (4) A, B and C
15. Which of the following activities would help to conserve water?
- A Taking a bath instead of a shower
 - B Using running water to wash the dishes instead of a basin
 - C Using half-flush instead of full-flush when flushing the toilet
 - D Brushing teeth with a cup of water instead of running tap water
- (1) A and B only
 - (2) A and D only
 - (3) B and C only
 - (4) C and D only

16. Shu Ting set up the circuit with a working bulb and battery as shown in the diagram below.

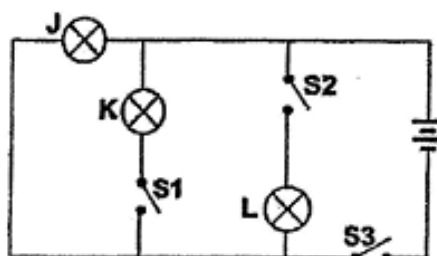


The bulb lit up at first. Shu Ting then connected 1 more working battery to the circuit and the bulb did not light up.

Which one of the following correctly explains why the bulb in the circuit did not light up?

- (1) There is no switch in the circuit.
- (2) The batteries are arranged wrongly.
- (3) One of the batteries have no energy.
- (4) There are not enough wires in the circuit.

17. Michelle set up an electric circuit as shown in the diagram below.

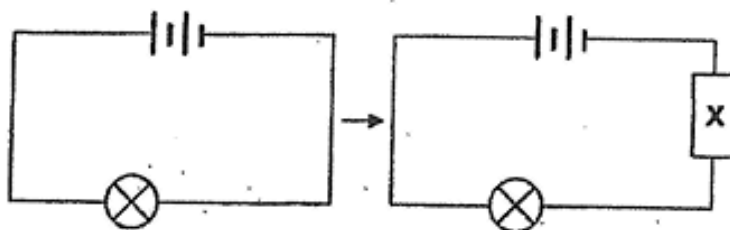


Michelle wanted bulb J to light up first, followed by bulb K and lastly, bulb L.

In which order must the switches, S1, S2 and S3, be closed so that the bulbs will light up according to Michelle's condition?

	First switch to be closed	Second switch to be closed	Last switch to be closed
(1)	S1	S2	S3
(2)	S1	S3	S2
(3)	S3	S1	S2
(4)	S3	S2	S1

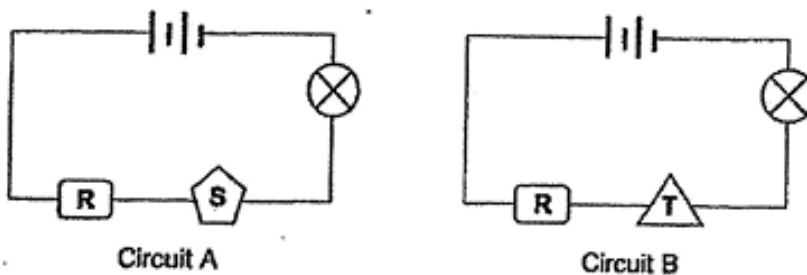
18. Juliana set up an electric circuit with 2 working batteries and 1 working bulb as shown below.



The bulb lit up at first. Juliana then connected material X to the circuit and the bulb did not light up.

Which of the following materials could material X most likely be?

- (1) iron
 - (2) steel
 - (3) plastic
 - (4) copper
19. Lucas set up 2 electrical circuits, A and B, as shown in the diagram below. In each circuit, he used a working bulb and 2 working batteries. He placed objects R and S in circuit A and objects R and T in circuit B.

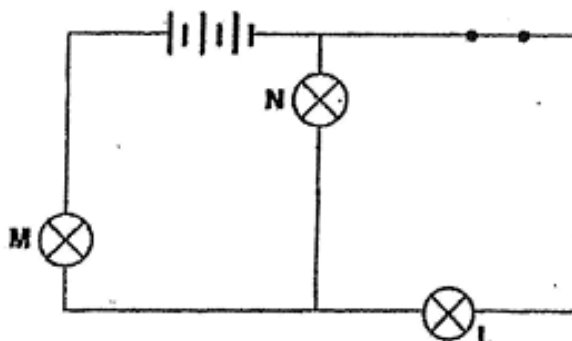


He then observed that only the bulb in circuit B lit up.

Which of the following materials did Lucas most likely used to make objects, R, S and T?

	Object R	Object S	Object T
(1)	steel	plastic	rubber
(2)	aluminium	rubber	iron
(3)	rubber	steel	aluminium
(4)	plastic	iron	steel

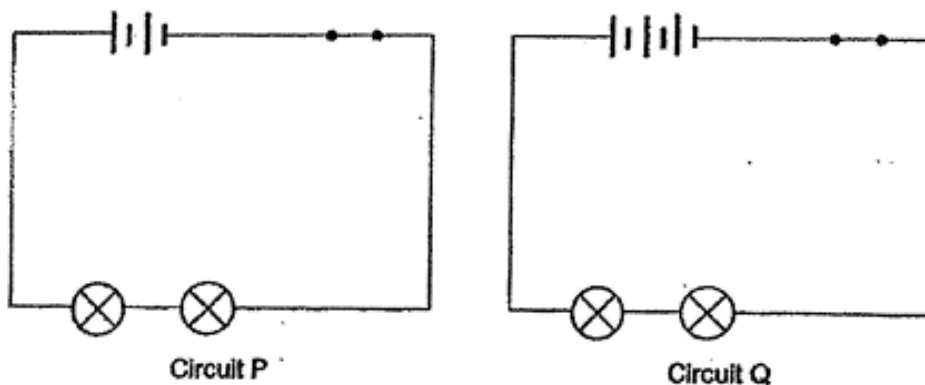
20. The diagram below shows an electrical circuit.



Which one of the following statements is correct?

- (1) There are 6 batteries in the circuit.
- (2) The switch controls all the bulbs in the circuit.
- (3) When bulb M fuses, bulbs N and L will still light up.
- (4) When bulb N fuses, bulbs M and L will still light up.

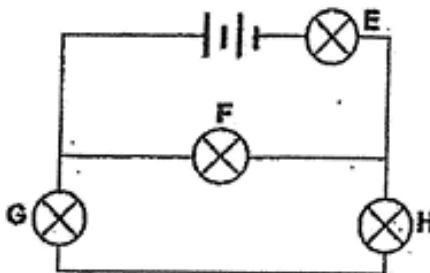
21. Gina set up two electrical circuits, P and Q, as shown in the diagram below.



Which one of the following correctly shows the aim of her experiment?

- (1) To find out if the number of wires affects the brightness of the bulbs.
- (2) To find out if the number of bulbs affects the brightness of the bulbs.
- (3) To find out if the number of switch affects the brightness of the bulbs.
- (4) To find out if the number of batteries affects the brightness of the bulbs.

22. The diagram below shows an electrical circuit with 2 working batteries and 4 bulbs, E, F, G and H.

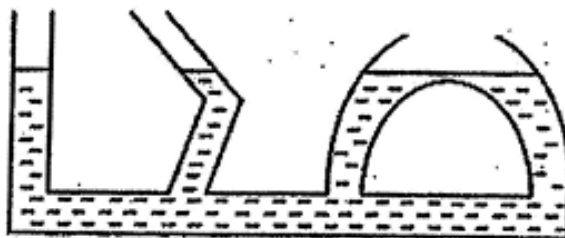


All the bulbs lit up. After some time, one bulb fused and all the 3 other bulbs did not light up.

Which one of the bulbs had fused?

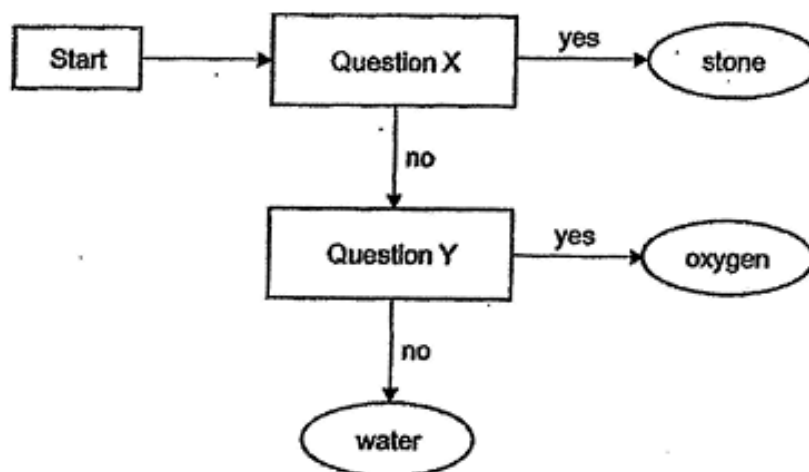
- (1) Bulb E
 (2) Bulb F
 (3) Bulb G
 (4) Bulb H
23. Which of the following statements show how to use electricity wisely and safely?
- A Put only one plug into each socket.
 B Switch off the fan when not in use.
 C Leave the television on when sleeping.
 D Pull the plug out of the socket when the switch is still on.
- (1) A and B only
 (2) A and C only
 (3) B and D only
 (4) C and D only
24. Which one of the following does not have mass and does not take up space?
- (1) air
 (2) heat
 (3) stone
 (4) water

25. Which property of liquids is shown through the experiment below?



- (1) Liquids have mass.
- (2) Liquids have definite shape.
- (3) Liquids have no definite volume.
- (4) Liquids take the shape of its container.

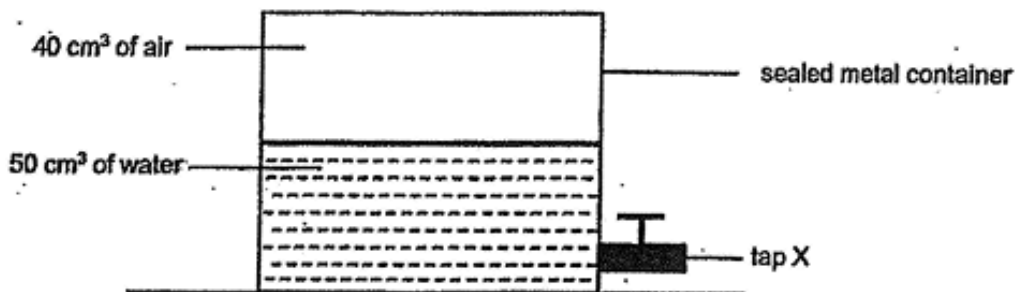
26. Study the flow chart below.



Which of the following correctly represent questions X and Y?

	Question X	Question Y
(1)	Does it have a definite volume?	Can it be compressed?
(2)	Does it have a definite shape?	Does it have a definite volume?
(3)	Does it have a definite shape?	Can it be compressed?
(4)	Can it be compressed?	Does it have a definite shape?

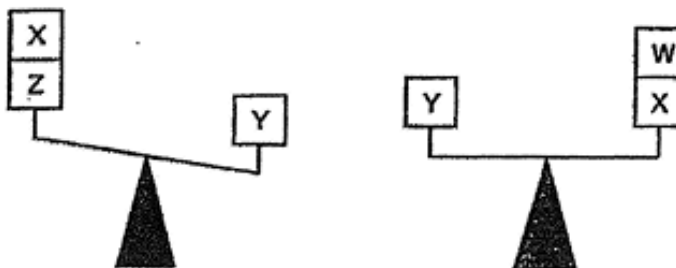
27. An experiment was set up using a sealed metal container which is totally filled with 50 cm^3 of water and 40 cm^3 of air as shown below. 20 cm^3 of water was then removed from the container through tap X.



What is the volume of air and water in the container at the end of the experiment?

	Volume of air	Volume of water
(1)	40 cm^3	50 cm^3
(2)	40 cm^3	30 cm^3
(3)	30 cm^3	60 cm^3
(4)	60 cm^3	30 cm^3

28. The diagram below shows the masses of objects W, X, Y and Z.



Based on the information above, which of the following conclusions correctly represent the masses of objects W, X, Y and Z?

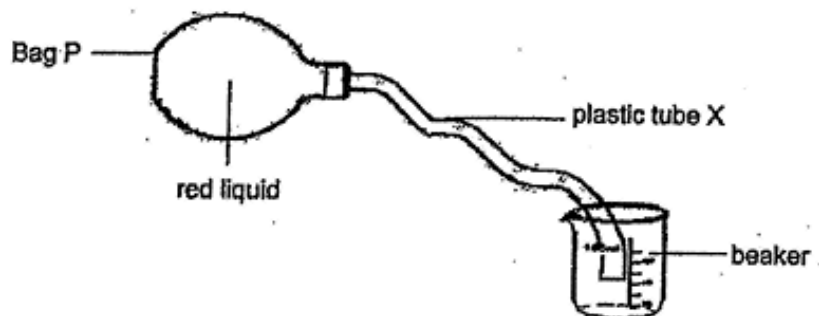
- A W has a greater mass than Z.
 B X has the same mass as Y.
 C The total mass of W, X and Z will be more than Y.

- (1) A only
 (2) A and C only
 (3) B and C only
 (4) A, B and C

~ END OF BOOKLET A ~

Section B: Open-Ended Questions [44 marks]

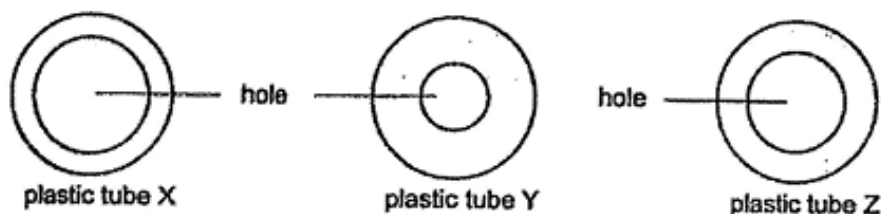
29. Frank made a model of the human circulatory system using bag P filled with red liquid and plastic tube X as shown below. When he squeezed bag P, the red liquid flowed through tube X and is collected in the beaker.



- (a) Which organ in the human circulatory system can be represented by bag P? State the function of this organ.

[1]

Frank filled bag P with 100ml of red liquid and squeezed bag P once. He measured the amount of red liquid collected in the beaker. He repeated the experiment using plastic tubes Y and Z. He used the same strength to squeeze the bag each time. The cross-section of plastic tubes X, Y and Z, are shown below.



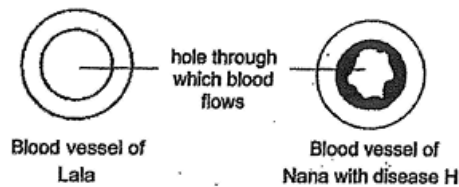
The results of his experiment are shown in the table below.

	Amount of red liquid collected in the beaker (ml)		
	Plastic tube X	Plastic tube Y	Plastic tube Z
1 st time	86	40	73
2 nd time	88	42	75
3 rd time	89	42	71

- (b) What is the relationship between the size of the hole in the plastic tube and the amount of red liquid collected in the beaker?

[1]

The diagram below shows the cross-section of a blood vessel belonging to Lala, a healthy person, and a blood vessel belonging to Nana, who has disease H.

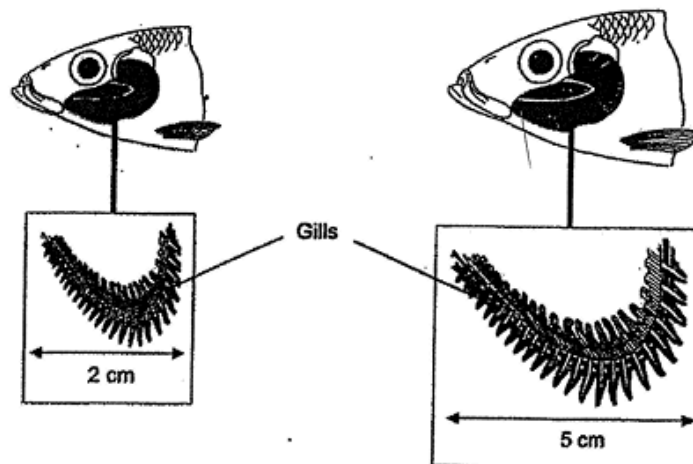


- (c) Based only on the information above, if both Lala and Nana's heart rate remains the same, explain why Nana will get less oxygen and digested food than Lala. [2]

30. The diagram below shows the gills of a young fish and an adult fish.

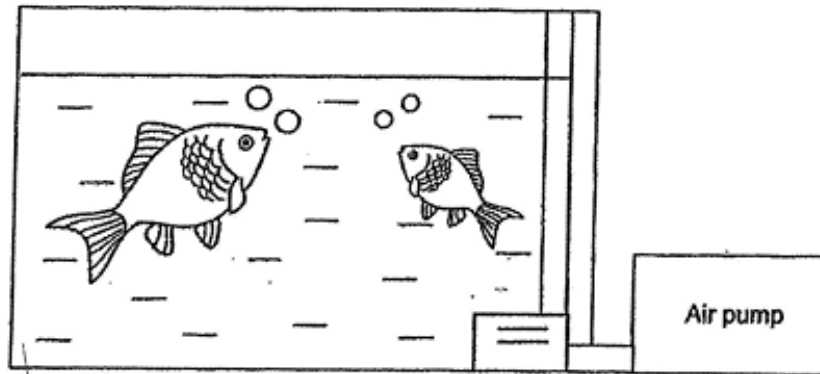
- (a) Describe how the fish obtains oxygen from water for life processes. [1]

The diagram below shows the gills of 2 fish of the same kind.



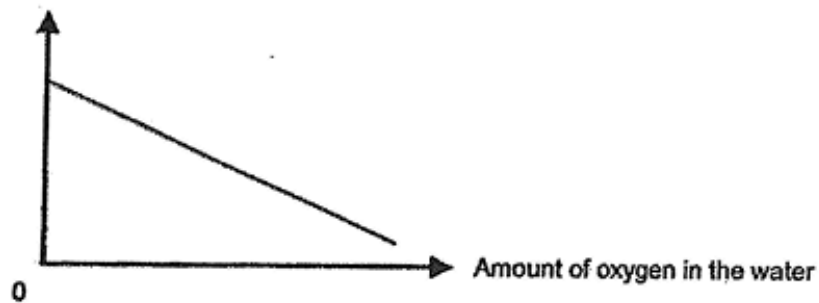
- (b) Based on the diagram above, give a reason why gaseous exchange is greater when the fish has bigger gills. [1]

John counted the number of times one of his pet fish opens and closes its mouth after the air pump in the fish tank was damaged.



Study the graph below.

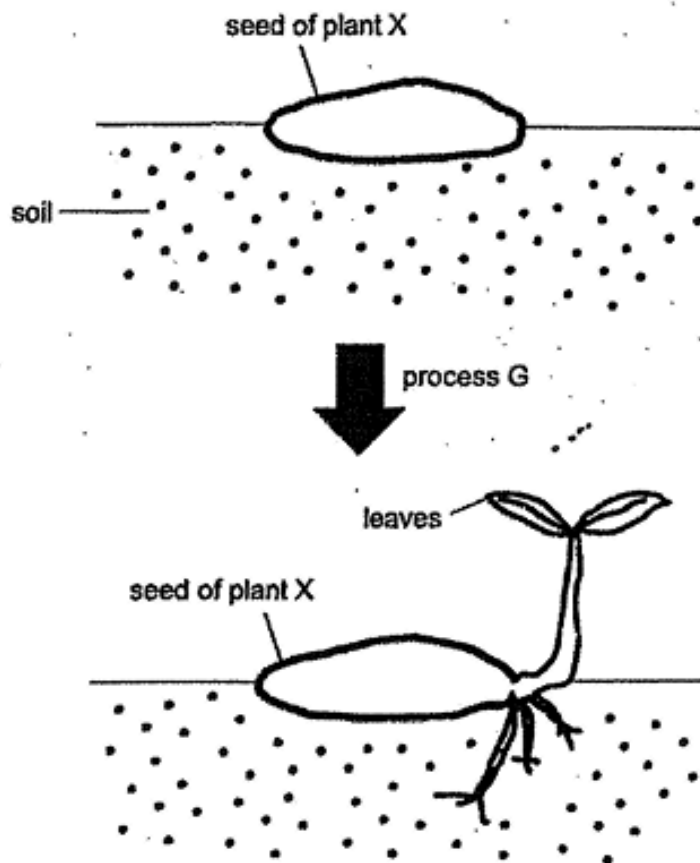
Number of times fish opens
and closes its mouth



- (c) State the relationship between the amount of oxygen in the water and the number of times fish opens and closes its mouth. [1]

- (d) Give a reason why the fish's breathing rate increases after the air pump was damaged. [1]

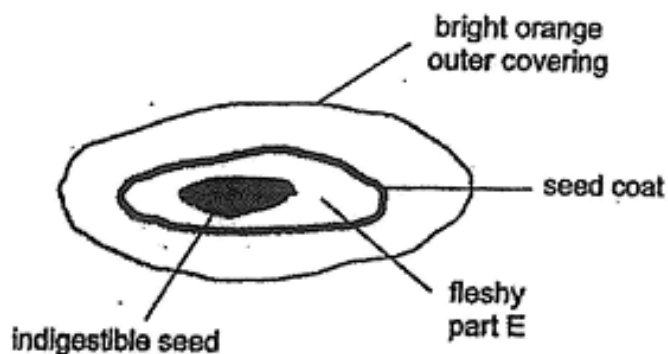
31. The diagram below shows a process G that takes place in the life cycle of plant X.



- (a) Identify process G. [1]

- (b) State all the conditions needed for process G to take place. [1]

The diagram below shows some parts of fruit X. The seed coat surrounds a fleshy part E.



Part E serves an important function during process G.

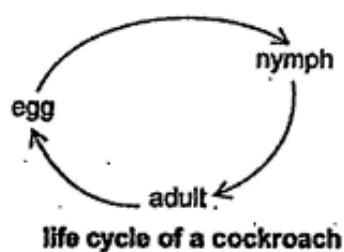
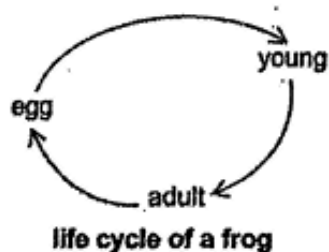
(c) Give a reason why this function is important before the first leaves develop. [1]

(d) Explain how the following characteristics of fruit X helps in its dispersal. [2]

(i) Bright orange outer covering

(ii) Indigestible seed

32. Study the life cycles of two animals as shown in the diagram below.

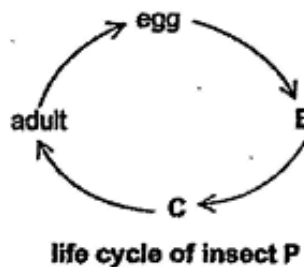


(a) State one similarity and one difference between the two life cycles. [2]

(i) Similarity:

(ii) Difference:

The diagram below shows the life cycle of insect P. In stage B, it eats a lot, grows very quickly, is bigger in size and moults several times. In stage C, it does not feed on anything and it seldom moves.

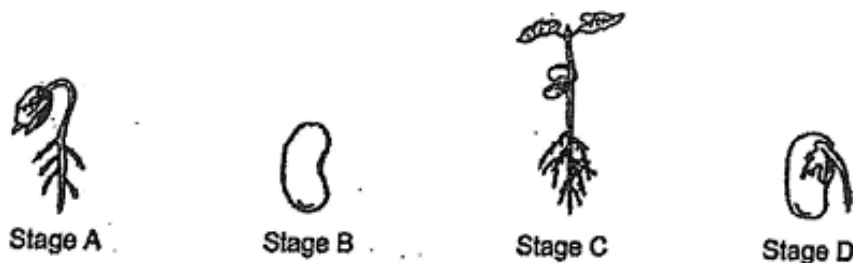


(b) Identify the stages, B and C, in the life cycle of insect P. [1]

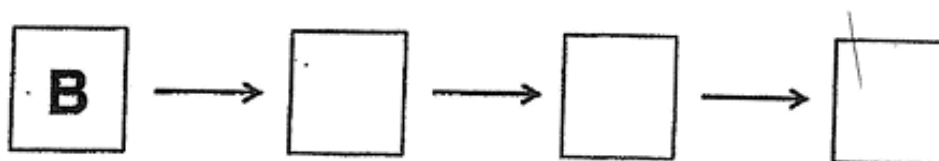
(i) Stage B	
(ii) Stage C	

(c) State an example of insect P. [1]

33. The diagram below shows the different stages of the growth of a green bean plant.



- (a) Arrange the growth of the green bean seed in the correct order by filling in the letters, A, C and D, in the diagram below. [1]



Gina planted the green bean seed in a pot of soil in a black box. The surrounding temperature was 28°C. The seed did not germinate.

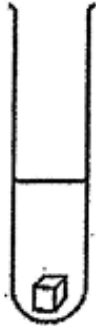
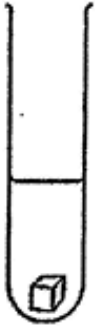
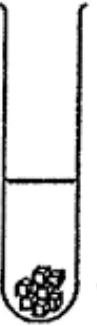
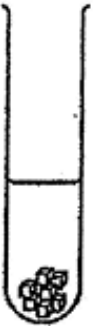
- (b) Suggest one change to enable the seed to germinate. Explain your answer. [2]

34. The circulatory system works with the digestive system to provide us with energy to do work.

- (a) Beside water, identify the substance provided by the digestive system which is transported in the circulatory system. [1]

- (b) Describe how the substance stated in (a) reaches the different parts of the body from the digestive system. [1]

35. Bob carried out the experiment below to find out how food gets digested.

			
V	W	X	Y
20g sausage cube + 30 cm ³ of water	20g sausage cube + 30 cm ³ of digestive juices	20g cut up sausage cube + 30 cm ³ of digestive juices	20g cut up sausage cube + 30 cm ³ of water

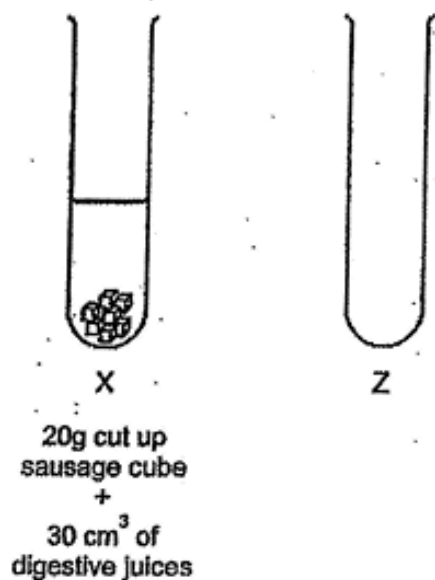
He recorded the time taken for the sausage cube(s) to be digested in each test tube in the table below.

Test tube	Result
V	not digested after 2 hours
W	digested in 2 hours
X	digested in 1 hour
Y	not digested after 2 hours

(a) Based on the information given, what could be concluded from the result of test tubes V and Y? [1]

(b) Based on the results in tubes W and X, explain how chewing food helps in digestion. [2]

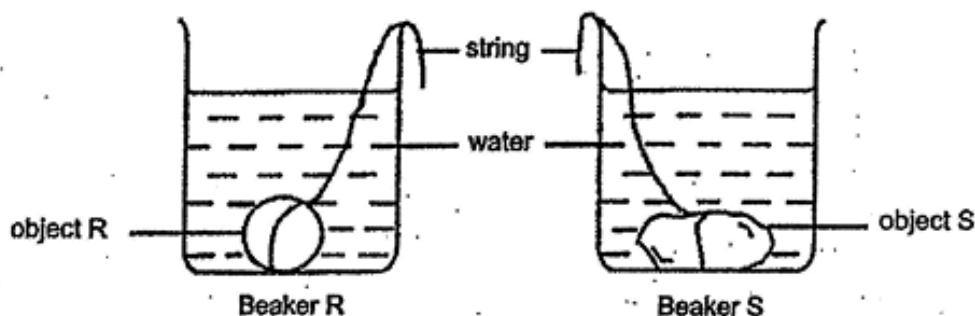
Bob wanted to find out if boiled digestive juices can help to digest food. He used the set-up below.



- (c) Based on set-up X above, fill in the table below by stating the amount of the following variables that Bob must put in test tube Z to conduct a fair test. [1]

	Variables	Amount
(i)	Uncut sausage cube	(g)
(ii)	Cut up sausage	(g)
(iii)	Digestive juices	(cm ³)
(iv)	Boiled digestive juices	(cm ³)

36. Joyce lowered objects R and S into similar beakers. Water was then poured into both beakers until they reached the same level as shown below.


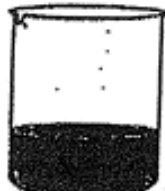
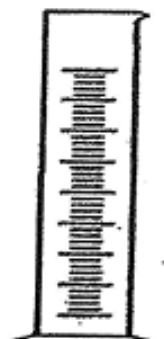



- (a) When objects R and S were taken out of the water, what observation about the water level would show Joyce that object S has a bigger volume? [1]

Objects R and S have definite shape.

- (b) Based on the results of the experiment, state another property of object R and S. [1]

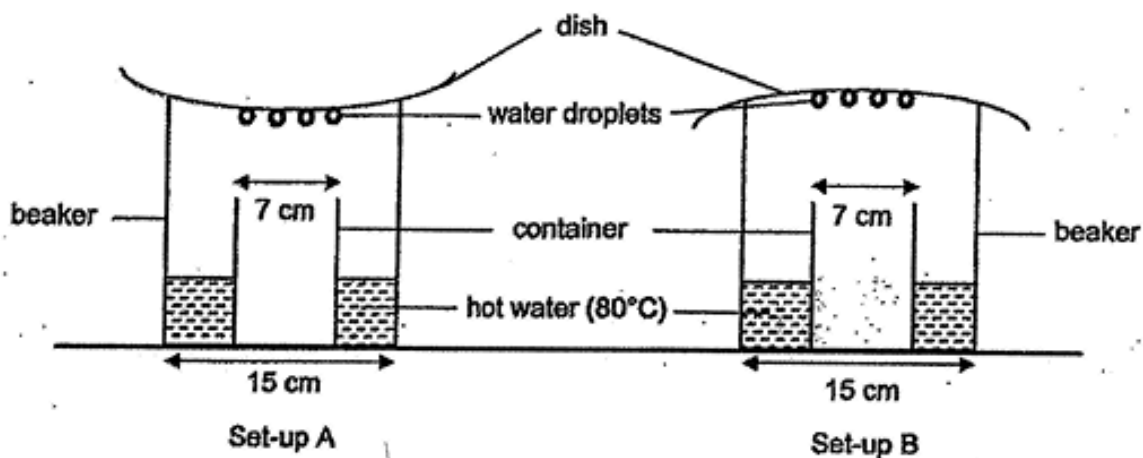
Joyce wanted to find the exact volume of object R. She was given the following items:

			
Object R	A container of water	A measuring cylinder	An electronic balance

(c) Using your choice of any of the item(s) provided, describe the steps that Joyce would need to take to find the volume of object R. (You do not need to fill in all the boxes provided.) [2]

Step	Description
1	Pour the water from the container into the measuring cylinder.
2	
3	
4	
5	

37. John carried out an experiment as shown below.



- (a) Give a reason why John observed that more water was collected in the container in set-up A than the container in set-up B. [1]

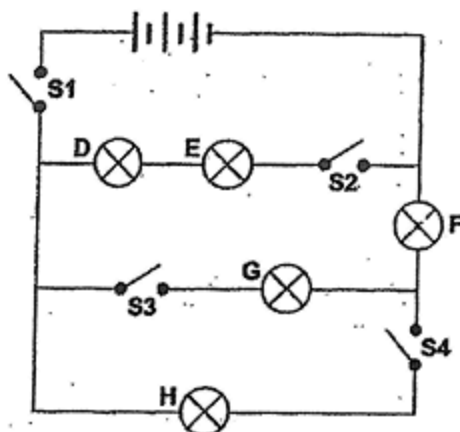
- (b) State the two variables that ensure that the rate of evaporation in the two beakers is the same. [1]

(i)

(ii)

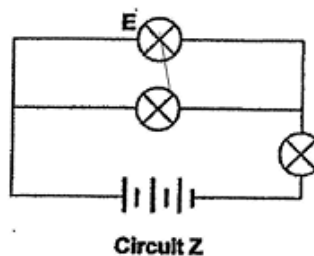
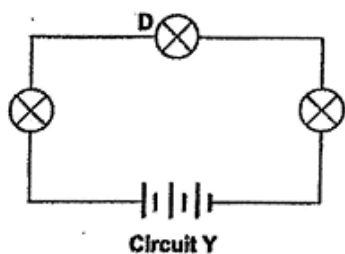
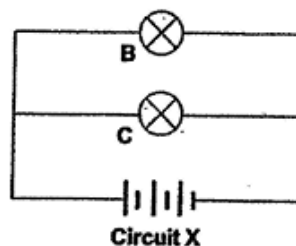
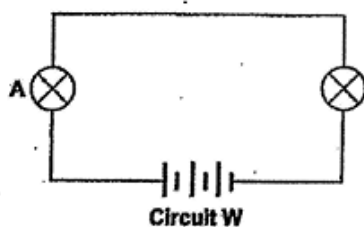
- (c) With reference to processes of evaporation and condensation, explain how the formation of water droplets under the dish is affected when a narrower beaker is used. [2]

38. Wilson set up the electrical circuit with 3 working batteries, 5 working bulbs, D, E, F, G and H, and 4 switches, S1, S2, S3 and S4, as shown below.



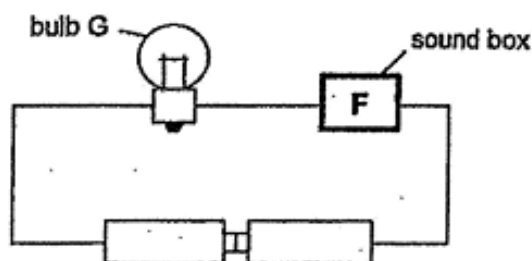
- (a) Which bulb(s) will light up when only switches, S1 and S3 are closed? [1]
-
- (b) Which switch(es) must be closed in order for bulbs D, E, F and H to light up? [1]
-

39. Ganesh set up 4 electrical circuits, W, X, Y and Z, as shown in the diagram below.



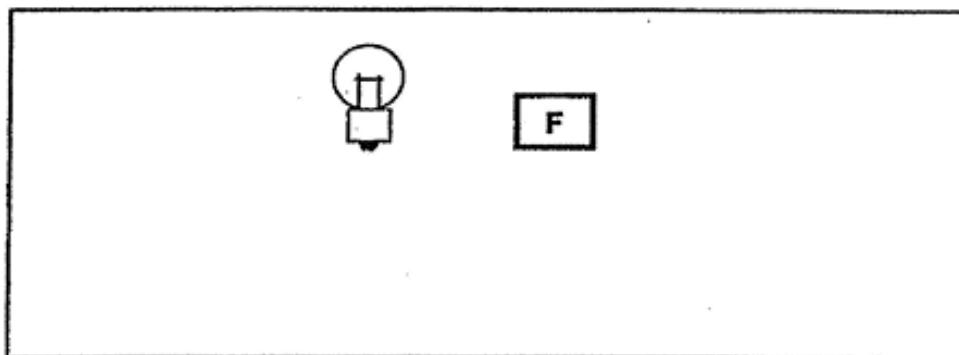
- (a) State the number of batteries in Circuit X. [1]
- _____
- (b) Which bulb(s), A, C, D or E will have the same brightness as Bulb B? Give a reason for your answer. [1]
- _____
- _____
- (c) Which bulb is the dimmest? Give a reason for your answer. [1]
- _____
- _____
- (d) What is the advantage of arranging the bulbs in Circuit Z as compared to Circuit Y? [1]
- _____
- _____
- (e) When bulb A fused, will the other bulb in Circuit W light up? Explain your answer. [1]
- _____
- _____
- _____

40. Max created a toy alarm system. He set up the electric circuit in the alarm using a sound box F, bulb G and two batteries as shown in the diagram below.



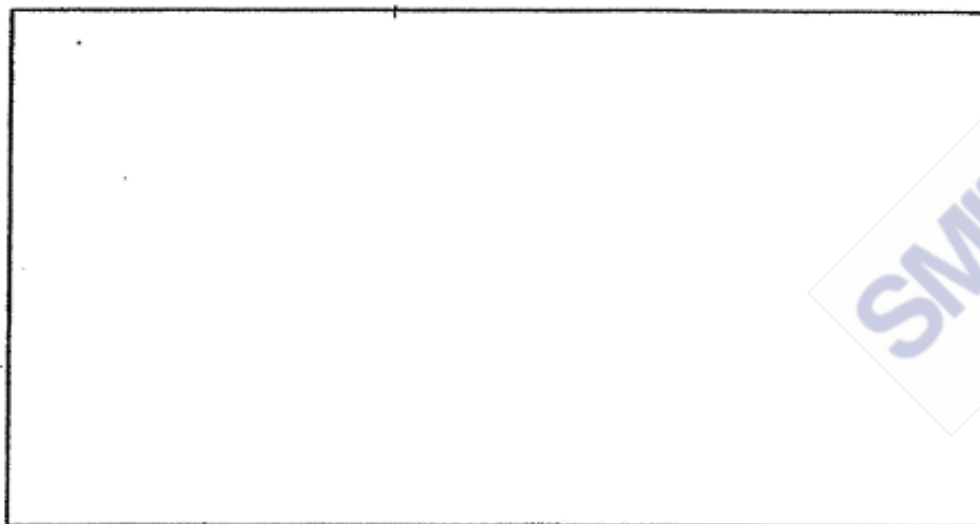
Max noticed that there was no sound and the bulb did not light up. His teacher told him that he had made a few mistakes in setting up his circuit.

- (a) Draw a circuit below to correct his mistakes. [1]



Max added another bulb, H and a switch. When he closes the switch, both bulbs light up at the same time and the sound box rings. However, when bulb G fuses, bulb H will still light up.

- (b) Using symbols, draw a circuit diagram to show how you would connect the switch, sound box F, bulb G and bulb H to the circuit. [2]

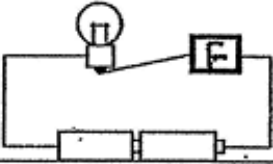
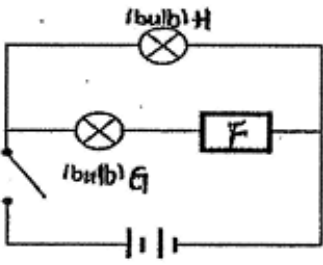


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ANSWER SHEET

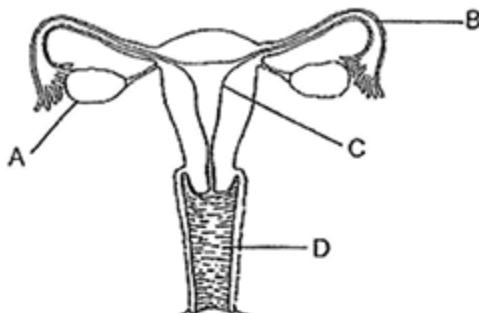
Qn	Ans	Qn	Ans	Qn	Ans	Qn	Ans	Qn	Ans	Qn	Ans
1	1	6	4	11	2	16	2	21	4	26	3
2	4	7	3	12	1	17	3	22	1	27	4
3	2	8	4	13	2	18	3	23	1	28	2
4	1	9	1	14	2	19	2	24	2		
5	2	10	1	15	4	20	4	25	4		

Qns No	Answer				
29	a Heart. To pump blood around the body.				
	b The bigger the size of the hole in the plastic tube, the more amount of red liquid collected in the beaker.				
	c Data: Blood vessel is partially blocked. Explain: Less blood containing oxygen and digested food can be transported to all parts of the body.				
30	a Water with dissolved oxygen enters through the mouth. The gills absorb oxygen from the water into the blood.				
	b The fish with bigger gills have a larger exposed surface area than the fish with smaller gills.				
	c As the amount of oxygen in the water decreases, the number of times fish opens and closes its mouth increases.				
	d Data: The amount of dissolved oxygen in the water decreases over time. Explain: Hence, the fish breathing rate increases to take in enough dissolved oxygen from the water.				
31	a germination				
	b water, warmth and oxygen/air				
	c (Void) Without the leaves, the seedling cannot make food. Part E provides food for the seedling.				
	d i. To attract animals to eat the fruits ii. Animals will throw away / pass out the seed after eating the fruit.				
32	a i. Both life cycles have 3 stages. ii. The young of the frog does not resemble its adult but the nymph of the cockroach resembles its adult. OR The frog spends part of its life cycle in water but the cockroach spends its entire life cycle on land.				
	b <table border="1" style="margin-left: 20px;"> <tr> <td>(i) Stage B</td><td>larva</td></tr> <tr> <td>(ii) Stage C</td><td>pupa</td></tr> </table>	(i) Stage B	larva	(ii) Stage C	pupa
(i) Stage B	larva				
(ii) Stage C	pupa				
	c Mosquito / Butterfly / Beetle				
33	a B → D → A → C				
	b Pour water on the seed / water the seed daily. The seed needs water to germinate.				
34	a Digested food				
	b At the small intestine, digested food is absorbed into the blood stream and transported by the blood to the different parts of the body.				
35	a Water cannot digest food				
	b Chewing breaks down food into smaller pieces and it increases the surface area of food exposed to digestive juices. Hence, digestion can be completed faster.				

	c.	<table border="1"> <tr> <td>(i)</td><td>Amount of uncut sausage cube</td><td>0 g</td></tr> <tr> <td>(ii)</td><td>Amount of cut up sausage</td><td>20 g</td></tr> <tr> <td>(iii)</td><td>Amount of digestive juices</td><td>0 cm³</td></tr> <tr> <td>(iv)</td><td>Amount of boiled digestive juices</td><td>30 cm³</td></tr> </table>	(i)	Amount of uncut sausage cube	0 g	(ii)	Amount of cut up sausage	20 g	(iii)	Amount of digestive juices	0 cm ³	(iv)	Amount of boiled digestive juices	30 cm ³
(i)	Amount of uncut sausage cube	0 g												
(ii)	Amount of cut up sausage	20 g												
(iii)	Amount of digestive juices	0 cm ³												
(iv)	Amount of boiled digestive juices	30 cm ³												
3 6	a	Beaker S has a lower water level/ less water than beaker R.												
	b	They have (definite or fixed) volume / occupy space.												
	c	Step 2: measure the volume of water in the measuring cylinder (A) Step 3: submerge R into the water Step 4: measure the volume of R and the water (B) Step 5: subtract the initial volume (A) from the new volume (B)												
3 7	a	Data: Dish is curved downwards towards the container Explain: More droplets rolled to the center of the dish and dripped from the middle into the container												
	b	i. The exposed surface area of hot water ii. The temperature of the hot water/surroundings												
	c	There is less exposed surface area of the water. Hence, there is less evaporation taking place. Therefore, less water vapour will condense into less water droplets.												
3 8	a	Bulbs F and G												
	b	S1, S2 and S4												
3 9	a	3												
	b	Choice: Bulb C Data: Bulb B and C are arranged in parallel. Explain: The same amount of electric current flows through the two bulbs												
	c	Choice: Bulb D Data: It is arranged in series Explain: The least amount of electric current flowed through the bulbs.												
	d	The bulbs in circuit Z are brighter than the bulbs in circuit Y.												
	e	Choice: No Data: The bulbs in circuit W are arranged in series Explain: When bulb A fused, it creates an open circuit and electric current cannot flow through the circuit.												
4 0	a													
	b													

RAFFLES GIRLS' PRIMARY SCHOOL EOY PAPER

1. The diagram shows the female reproductive system of a human.



In which part of the female reproductive system will the fertilised egg develop into a baby?

- (1) A
- (2) B
- (3) C
- (4) D

2. The table shows the physical characteristics of four members in the Lim family.

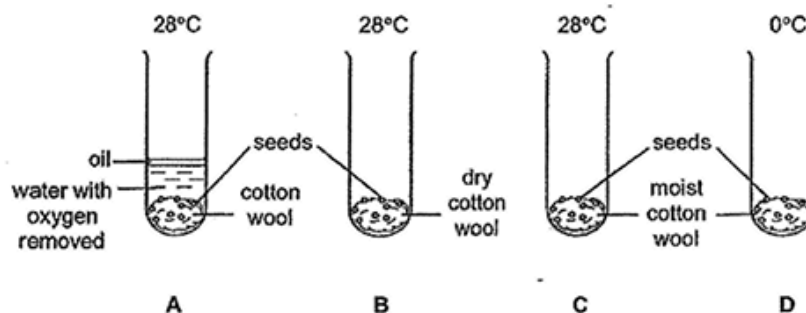
Family member	Eye colour	Hair colour	Hair type	Type of earlobe
Mr Lim	Black	Black	Wavy	Attached
Mrs Lim	Brown	Brown	Straight	Attached
Issac (son)	Brown	Black	Straight	Detached
Inez (daughter)	Brown	Brown	Wavy	Detached

Based on the information in the table, which of the following statement(s) is/are correct?

- A Inez inherited her wavy hair from her father.
- B Inez inherited more of her mother's traits than Issac.
- C Both Issac and Inez inherited detached earlobes from their parents.

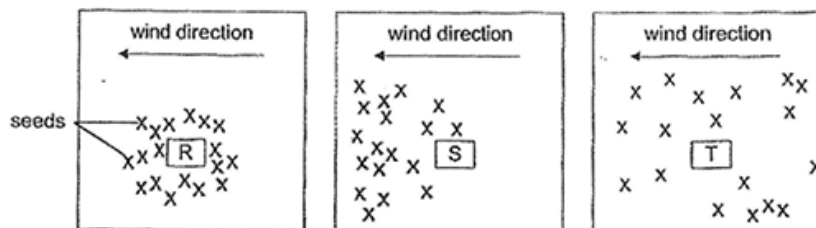
- (1) A only
- (2) A and B only
- (3) B and C only
- (4) A, B and C

3. The diagrams show the conditions which the identical seeds in set-ups A, B, C and D were exposed to. Identical number of seeds were placed in each test tube.



In which set-up(s) would the seeds germinate?

- (1) A only
 - (2) C only
 - (3) B and C
 - (4) C and D
4. Study the distribution of seeds of plants R, S and T in the diagrams shown.



How were the seeds of plants R, S and T dispersed?

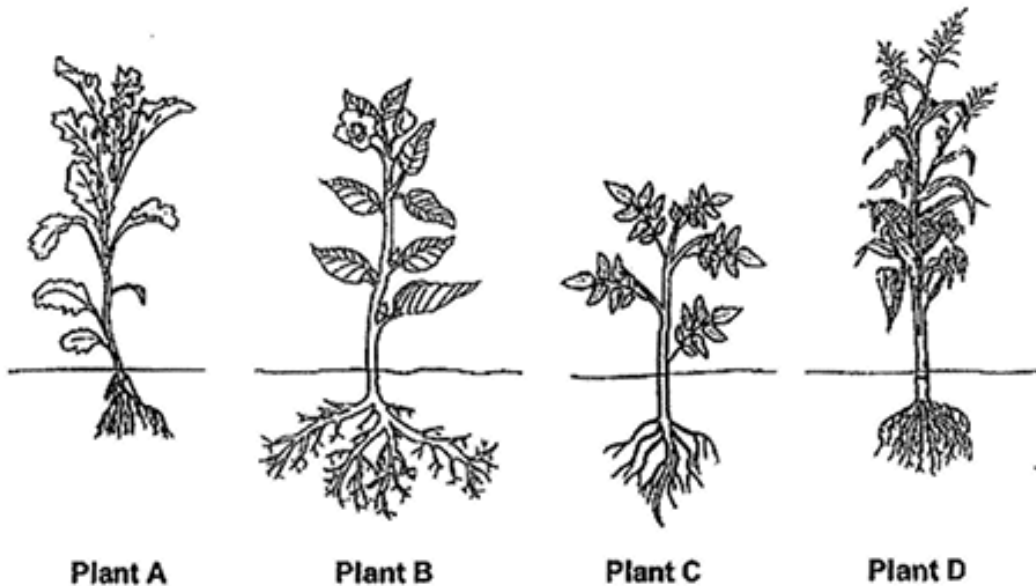
	R	S	T
(1)	Animal	Explosive action	Wind
(2)	Explosive action	Wind	Animal
(3)	Explosive action	Animal	Wind
(4)	Wind	Animal	Explosive action

5. Which of the following is/are function(s) of leaves?

- A Make food
- B Take in water
- C Take in and give out gases

- (1) A only
- (2) A and B only
- (3) A and C only
- (4) B and C only

6. The diagrams show four plants.



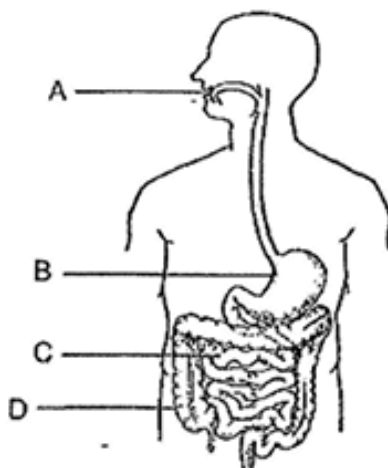
During a heavy rain, which of these plants is most likely to be uprooted first?

- (1) Plant A
- (2) Plant B
- (3) Plant C
- (4) Plant D

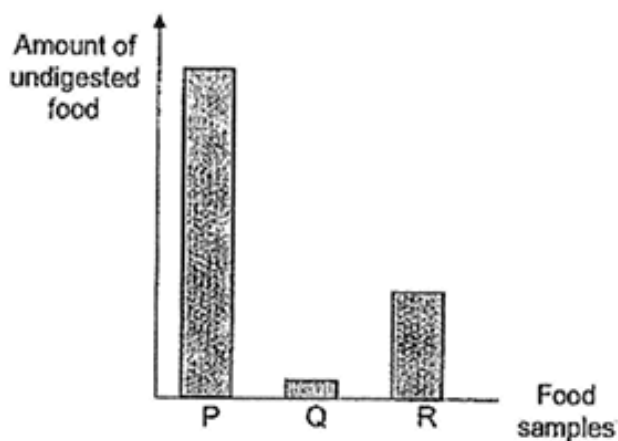
7. Which of the following function of the human body system is not correct?

	Human body system	Function
(1)	Skeletal system	Gives the body its shape
(2)	Digestive system	Breaks down food into simpler substances
(3)	Muscular system	Enables the body to move
(4)	Circulatory system	Takes in oxygen and removes carbon dioxide from the body

8. The diagram shows a human digestive system with some of its organs labelled A, B, C and D.



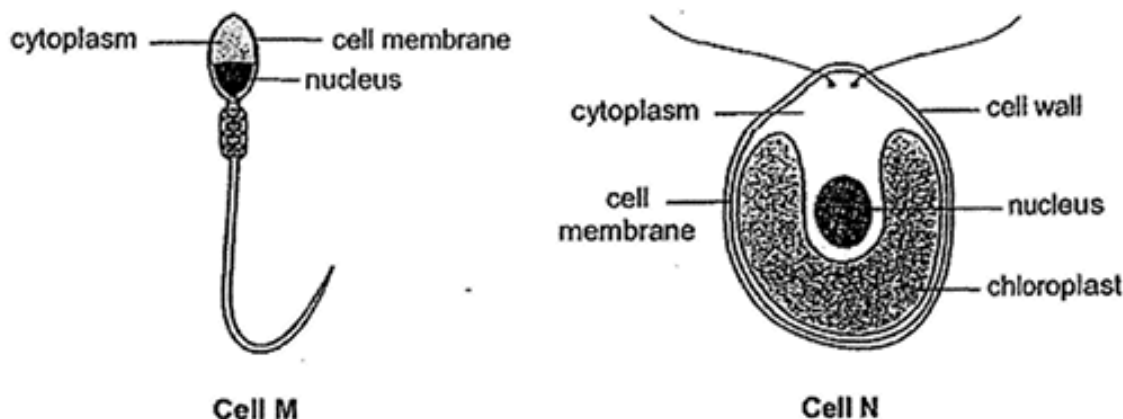
The graph shows the amount of undigested food at various parts of the digestive system.



Which of the following correctly shows the organ where the food sample was obtained from?

	Organ	Food sample
(1)	A	R
(2)	B	Q
(3)	C	Q
(4)	D	P

9. The diagram shows cells M and N.



Which one of the following correctly shows the difference between cells M and N?

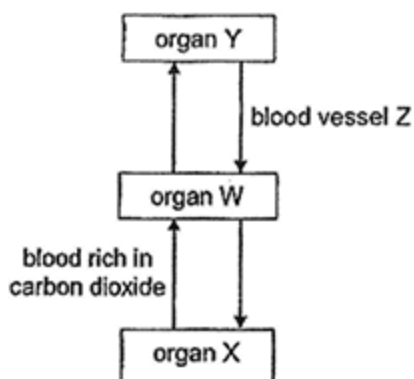
- (1) Cell M will be able to reproduce but not cell N.
- (2) Cell M will not burst when placed in water but cell N will burst when placed in water.
- (3) Cell N will be able to trap sunlight to make food but not cell M.
- (4) Cell N will only allow some substances to enter the cell but cell M will allow all substances to enter.

10. Which of the following statement(s) is/are true?

- A Air is needed for living things to survive.
- B Less nitrogen is breathed out than breathed in.
- C A runner produces more carbon dioxide during a run than when he is at rest.
- D Oxygen, carbon dioxide, water vapour and nitrogen enter the respiratory system during breathing.

- (1) A only
- (2) B and C only
- (3) A and D only
- (4) A, C and D only

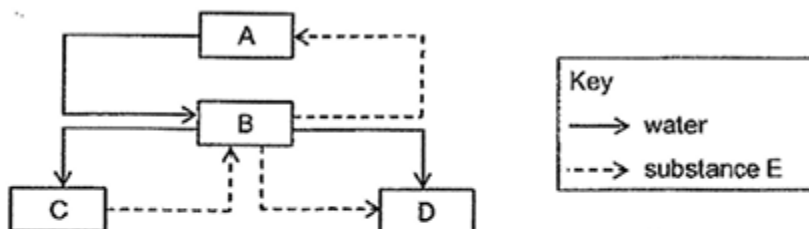
11. The diagram shows the flow of blood, represented by the arrows, in the human circulatory system.



Which of the following best represents organs W, X and Y and the concentration of the gas in the blood in blood vessel Z?

	Organ W	Organ X	Organ Y	Blood in blood vessel Z
(1)	Heart	Lungs	Small intestine	Rich in carbon dioxide
(2)	Heart	Small intestine	Lungs	Rich in oxygen
(3)	Lungs	Small intestine	Heart	Rich in carbon dioxide
(4)	Lungs	Small intestine	Heart	Rich in oxygen

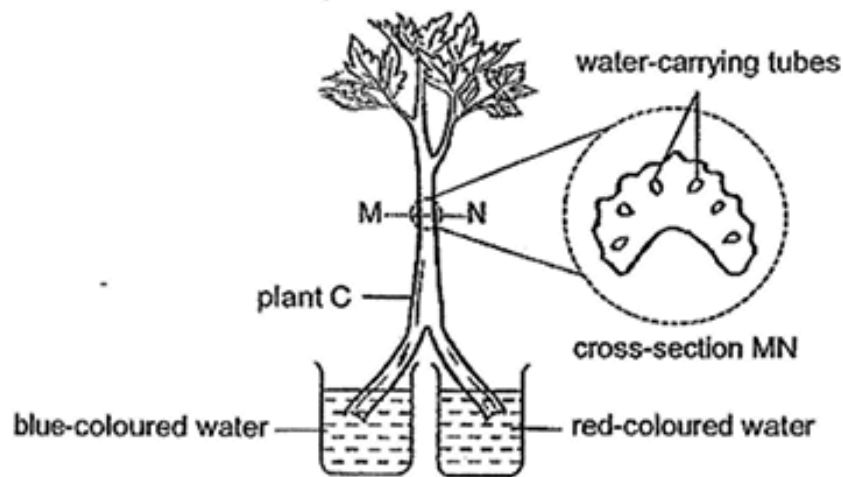
12. The diagram shows how water and substance E are transported to parts, A, B, C and D of a plant.



What do parts A, B and C represent?

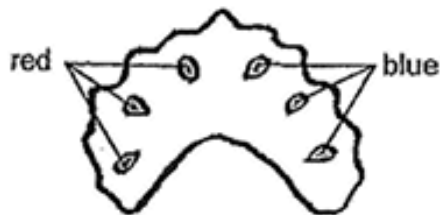
	A	B	C
(1)	Flower	Root	Leaf
(2)	Leaf	Flower	Stem
(3)	Root	Leaf	Stem
(4)	Root	Stem	Leaf

13. A stalk of plant C was split into two as shown in the diagram. Each section was placed into different coloured water.

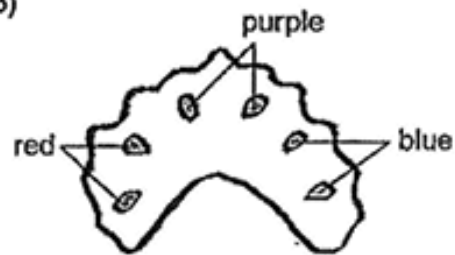


Which one of the following would be the observation made on the colour(s) of the water-carrying tube, if a cut was made at section MN?

(1)



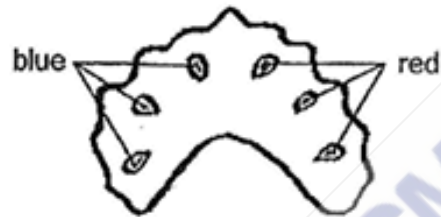
(3)



(2)



(4)

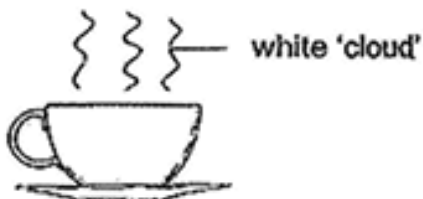


14. Four identical beakers, W, X, Y and Z, filled with the same amount of water were exposed to different conditions as shown in the table.

Beakers	W	X	Y	Z
Conditions	Cool Windy	Cool Not windy	Sunny Windy	Sunny Not windy

Which of the following beakers will contain the least amount of water after one day?

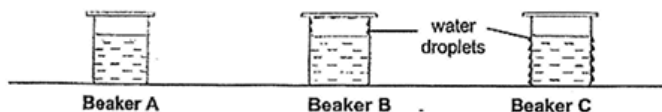
- (1) Beaker W
 - (2) Beaker X
 - (3) Beaker Y
 - (4) Beaker Z
15. The diagram shows a cup of hot coffee placed on the table.



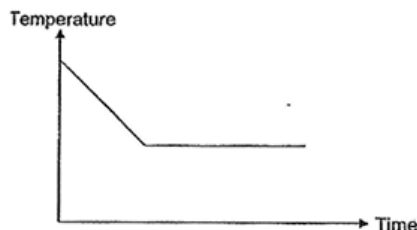
Which of the following processes resulted in the formation of the white 'cloud'?

- (1) Boiling
- (2) Freezing
- (3) Evaporation
- (4) Condensation.

16. Three identical beakers, A, B and C, were filled with equal volume of water of different temperatures. The beakers were covered with identical lids and placed on a table in a room with a temperature of 29°C . Water droplets were formed on cups B and C are shown in the diagram.

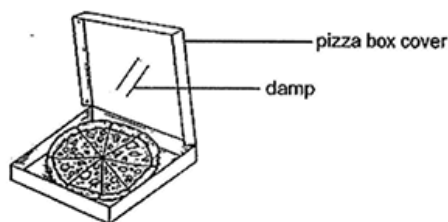


The graph shows the change in temperature in the water over a period of time.



Which of the following beaker(s) contained water which had the temperature change as shown in the graph?

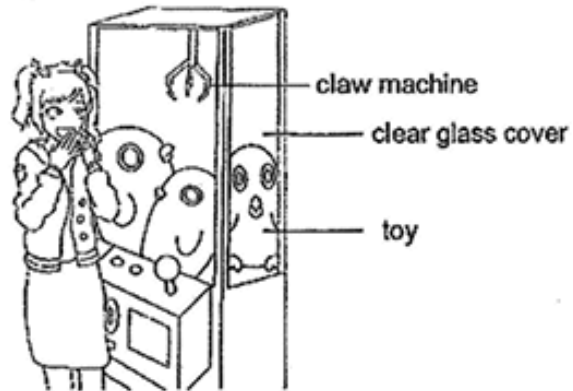
- (1) Beaker A only
 - (2) Beaker B only
 - (3) Beaker C only
 - (4) Beakers B and C only
17. Tina bought a hot pizza and brought it home. When she opened the box at home, she observed that the underside of the pizza box cover was damp as shown in the diagram.



Which of the following would cause the underside of the pizza box cover to be less damp?

- A Use a metal pizza box.
 - B Use a styrofoam pizza box.
 - C Make holes on the pizza cover.
 - D Leave the pizza box cover slightly open.
- (1) A and B only
 - (2) C and D only
 - (3) A, C and D only
 - (4) A, B, C and D

18. Allison looks into a claw machine placed in a bright arcade room as shown in the diagram.



Which statement explains why she can see the toys in the machine?

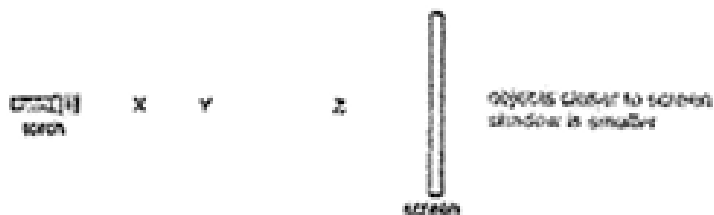
- (1) The toy gave out light that entered her eyes.
- (2) Most light passed through the toys and entered her eyes.
- (3) Some light was reflected from the glass cover and entered her eyes.
- (4) Most light reflected by the toys passed through the glass cover and entered her eyes.


Name: _____


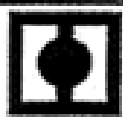
Class: _____

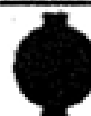
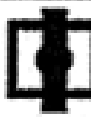
 Date: 1st November '21

Q19.

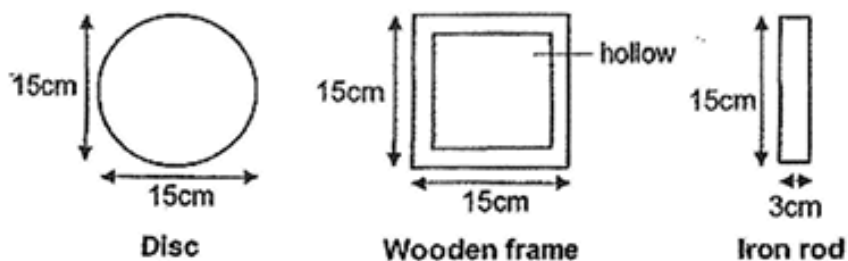


	X	Y	Z	shadow
Scenario 1a	disc	wooden frame	iron rod	
Scenario 1b	disc	iron rod	wooden frame	

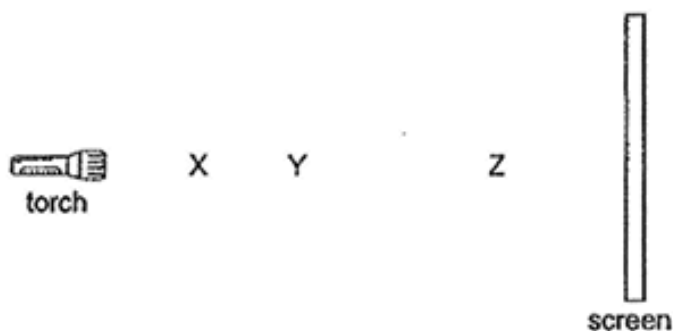
	X	Y	Z	shadow
Scenario 2a	wooden frame	disc	iron rod	
Scenario 2b	wooden frame	iron rod	disc	

	X	Y	Z	shadow
Scenario 3a	iron rod	disc	wooden frame	
Scenario 3b	iron rod	wooden frame	disc	

19. The diagram shows three objects with the following heights and widths.



The objects were placed one at each position, X, Y and Z, from the torch as shown in the diagram. The shadows were cast on a screen.



Which of the following are possible shadows that could be casted on the screen?



Shadow A



Shadow B



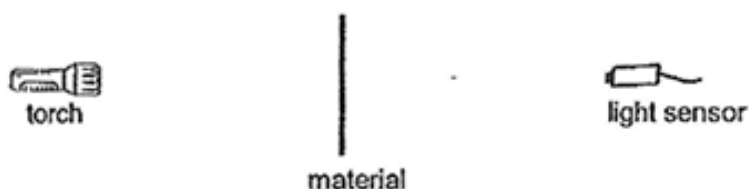
Shadow C



Shadow D

- (1) A and C only
- (2) B and D only
- (3) A, B and C only
- (4) B, C and D only

20. Ben prepared an experimental set-up to find out the degree of transparency of materials J, K and L as shown in the diagram.

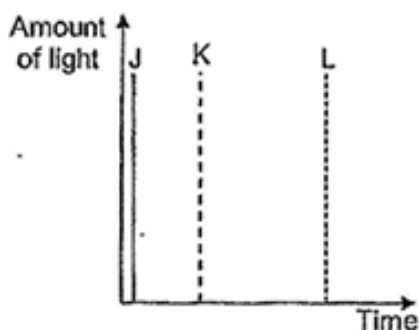


He recorded the amount of light that passed through each material over a period of time in the table. He observed that the amount of light from the torch was 2000lux.

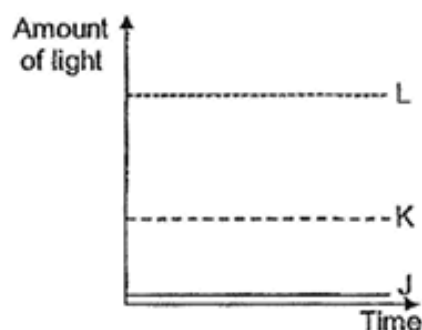
Materials	Amount of light (lux)
J	1000
K	20
L	400

Which graph shows his results correctly?

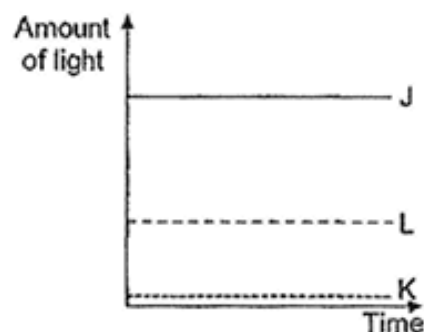
(1)



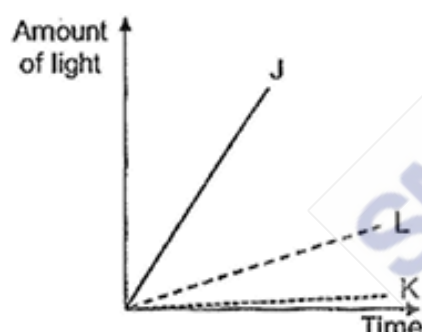
(2)



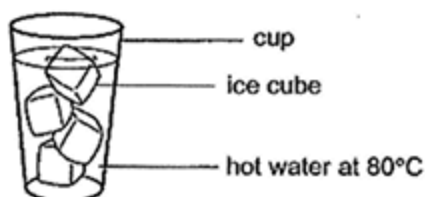
(3)



(4)



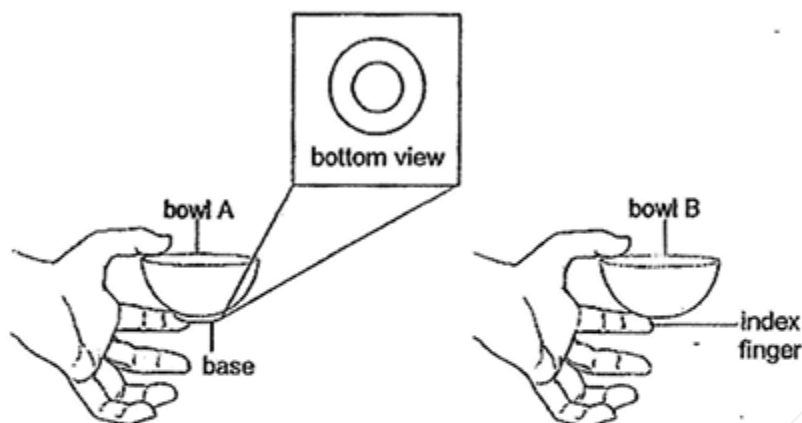
21. The diagram shows ice cubes in a cup of hot water.



Which of the following observations about the ice cubes is possible after a few minutes?

	Size of ice cubes	Direction of heat flow	
		From	To
(1)	Became smaller	Ice	Water
(2)	Became smaller	Water	Ice
(3)	Remained the same	Ice	Water
(4)	Remained the same	Water	Ice

22. Gordon has two bowls, A and B, made of the same material. He placed equal amount of hot rice into each bowl. He could hold bowl A without feeling much heat from the hot rice on his index finger but bowl B was too hot to hold.



Which of the following best explains why Gordon could hold bowl A without feeling much heat from the hot rice on his index finger but bowl B was too hot to hold?

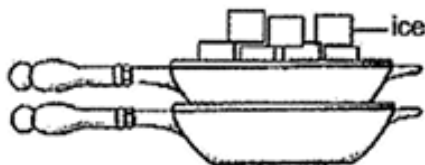
- (1) Bowl B is a poor conductor of heat.
- (2) Bowl A is a good conductor of heat.
- (3) Bowl B is a good conductor of heat but not the base of bowl A.
- (4) Distance from the heat source to the index finger is further in bowl A.

23. Hasan has two cooking pans stuck together as shown in the diagram.

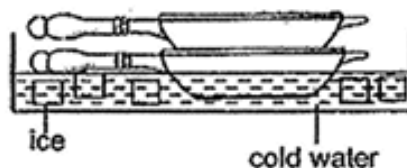


Which of the following method(s) could he use to separate the two cooking pans most easily?

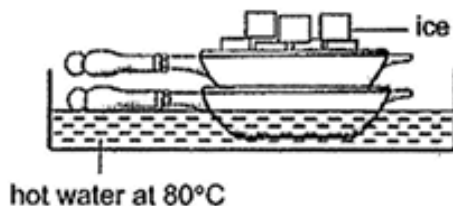
A



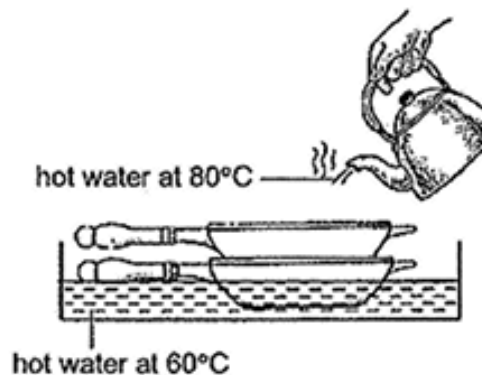
B



C



D

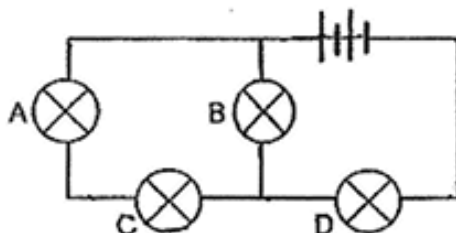


- (1) A only
- (2) A and C only
- (3) B and D only
- (4) C and D only

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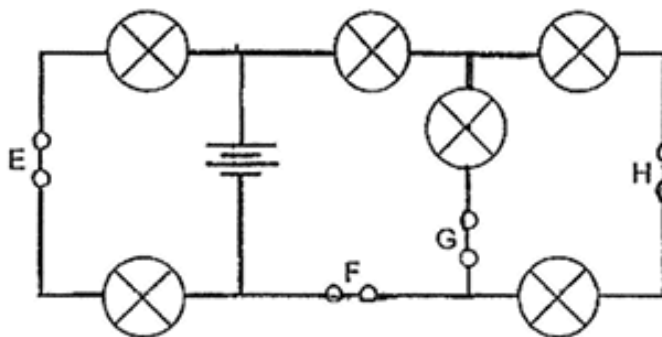
24. The diagram shows a closed circuit that consists of identical bulbs.



Which of the following bulbs, A, B, C or D, when removed, will cause none of the bulbs to light up?

- (1) A
 - (2) B
 - (3) C
 - (4) D
25. The diagram shows a closed circuit that consists of identical bulbs.

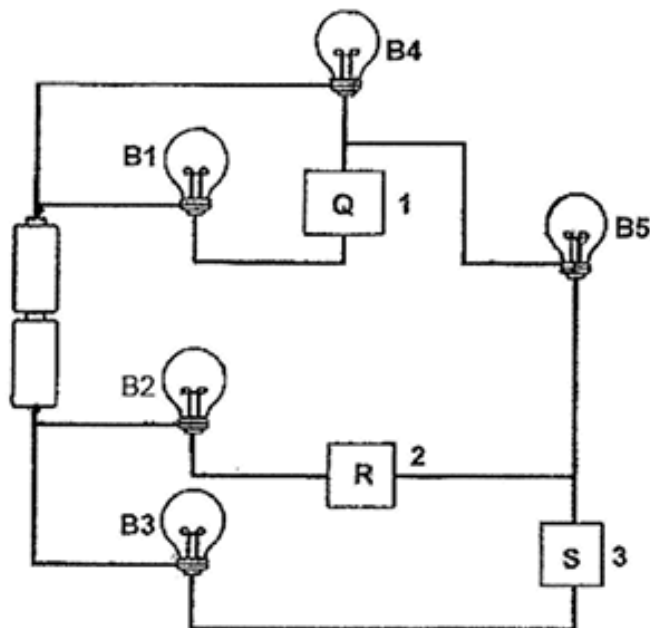
There was least number of bulbs that light up in the circuit when one of the switches was opened.



Which one of the following switches was most likely to be opened?

- (1) E
- (2) F
- (3) G
- (4) H

26. Caleb carried out an experiment to find out which materials, Q, R or S, can conduct electricity. He connected materials Q, R and S to the circuit at positions 1, 2 and 3 respectively as shown in the diagram.



He observed that only bulbs B2, B4 and B5 lit up. He then rearranged the materials S, Q and R and connected to the circuit at positions 1, 2 and 3 respectively.

Which of the following bulbs would light up after the re-arrangement of the materials?

- (1) B1 and B4
- (2) B1, B2 and B5
- (3) B1, B4 and B5
- (4) B3, B4 and B5

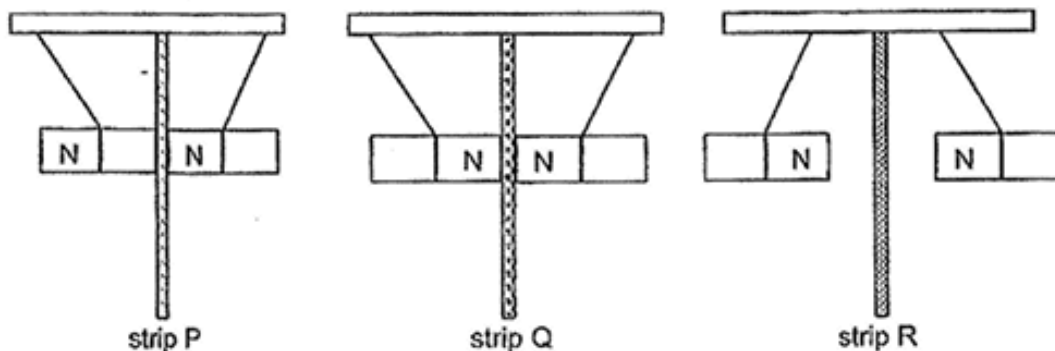
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27. The diagram shows how an iron nail was made into a temporary magnet using the stroke method. A bar magnet was used to stroke the iron nail repeatedly in the same direction thirty times as shown in the diagram.



Which one of the following would increase the magnetic strength of the magnetised iron nail?

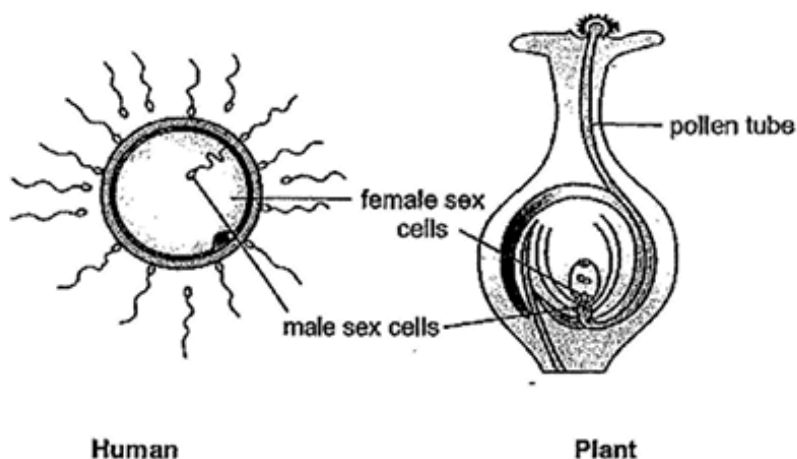
- (1) Drop the iron nail multiple times.
 - (2) Increase the size of the bar magnet.
 - (3) Stroke the iron nail in the opposite direction fifty times.
 - (4) Stroke the iron nail in the same direction another fifty times.
28. Thomas set up the following experiment to find out if strips P, Q and R were made of magnetic material. He placed the strips between two bar magnets. His observations are shown in the diagram.



Which of the following strip(s) is/are definitely made of a magnetic material?

- (1) Strip P only
- (2) Strip Q only
- (3) Strip R only
- (4) Strips P and R only

29. The diagrams show the process of the male sex cell fusing with the female sex cell in human and plant respectively.



- (a) State the process shown in the diagrams. [1]

- (b) Explain why large numbers of male sex cells are introduced into the female reproductive system each time during the process of reproduction. [1]

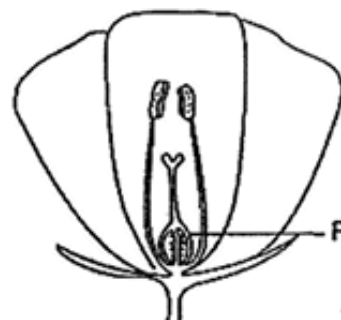
- (c) Which of the following statement(s) describe(s) the similarity between pollen grains and sperms? Put a (✓) in the correct box(es). [1]

Statement	Tick (✓)
Both the pollen grains and sperms are produced by the female parts.	
Both the pollen grains and sperms can move from place to place on their own.	
Both the pollen grains and sperms carry genetic information that can be passed down to their offspring.	

30. Study the two flowers, X and Y, as shown in the diagram.



Flower X



Flower Y

- (a) Based on the diagram, identify the methods of pollination for flowers X and Y by putting a (✓) in the correct boxes. [1]

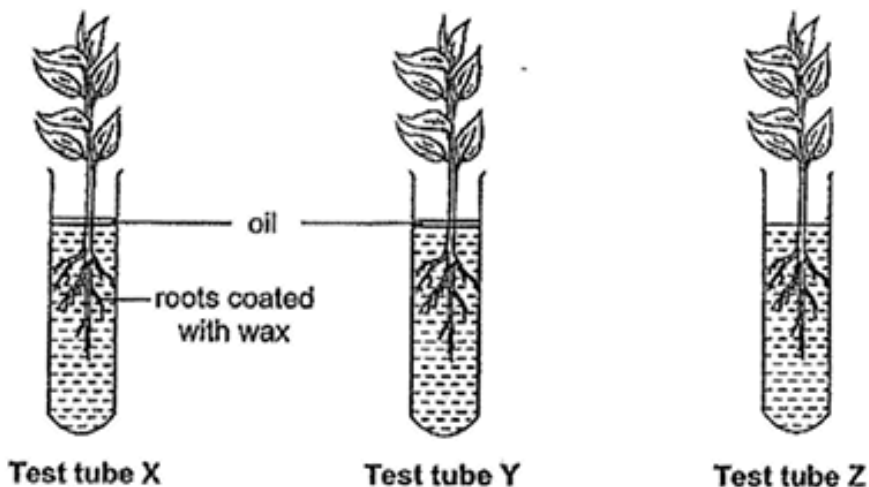
Method of pollination \ Flower	X	Y
Insect pollinated		
Wind pollinated		

- (b) State two characteristics of flower Y that enable the flower to be pollinated by the method identified in part (a). [2]

- (i) _____
- (ii) _____

- (c) What does part P develop into after fertilisation? [1]

31. Paula poured 20ml of water into each of the three test tubes X, Y and Z. Then she placed identical plants into each test tube as shown in the diagrams. The roots of the plant in test tube X were coated with wax.



Three days later, Paula recorded the amount of water left in each test tube in the table shown.

Test tube	Volume of water at the start (ml)	Volume of water at the end of three days (ml)
X	20	20
Y	20	(a) _____
Z	20	2

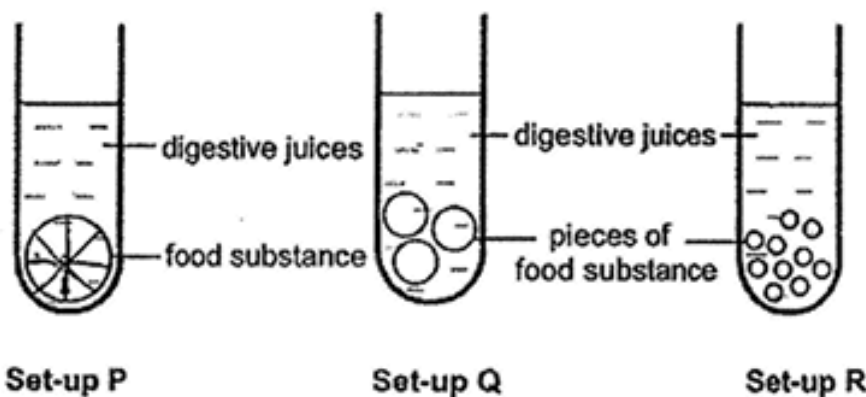
- (a) What is the possible volume of water left in test tube Y at the end of three days? Write your answer in the table above. [1]

- (b) Give your reason in your answer in (a).

- (c) Noah told Paula that she only needed to use two test tubes for her experiment. Which two test tubes should Paula use to ensure a fair test? [1]

32. Jane would like to find out if the size of the food substance affects the time taken for it to be completely digested.

She set up three set-ups, P, Q and R, with the same amount of identical food substance and equal amount of digestive juice. Set-ups Q and R contained the food substance broken into smaller pieces as shown in the diagram.



She recorded the results in the table.

Set-up	P	Q	R
Time taken for the food substance to be completely digested (min)	40	25	8

- (a) Based on the results, how does the size of the food substance affect the time taken for the food to be completely digested? [1]

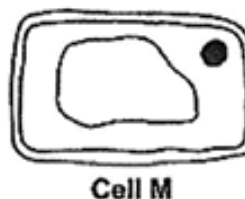
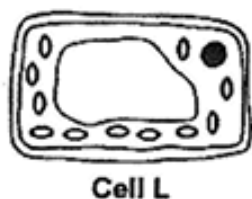
- (b) Based on the experiment above, explain how chewing helps in the digestion process. [2]

33. The diagram shows cell K.



- (a) In the diagram, name and label the part of cell K that controls the cell activities. [1]

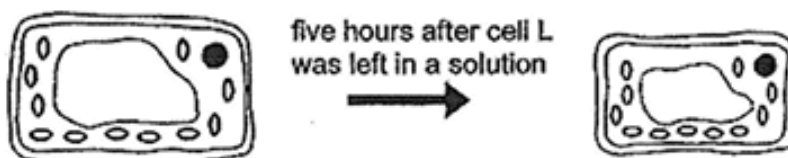
The diagram shows cells L and M from a plant.



- (b) Identify the part of the plant the cell came from and state a reason for your answer. [2]

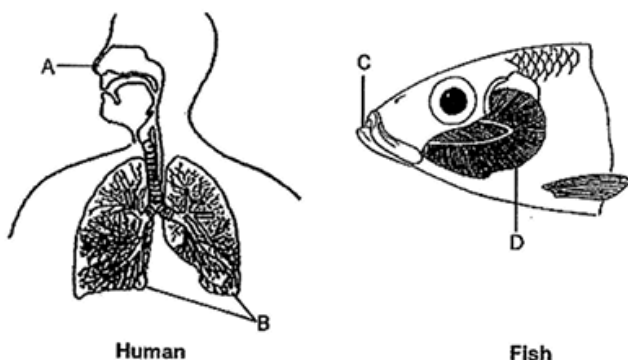
Cell	Part of plant the cell came from	Reason for your answer
L		
M		

Cell L was put in a solution and left for five hours. After five hours, it was observed that the cell had shrunk as shown in the diagram.



- (c) Which part of the cell is responsible for the shrinking of the cell? [1]

34. The diagrams show the different parts in the respiratory systems of a human and a fish.



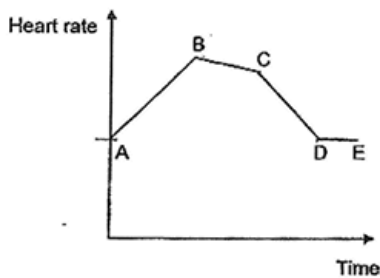
- (a) At which part, A, B, C or D, does gaseous exchange take place in a human and a fish respiratory systems? [1]

Human: _____

Fish: _____

- (b) Describe how the fish gets oxygen for its survival. [2]

35. The diagram shows Carine's heart rate during her morning exercise.

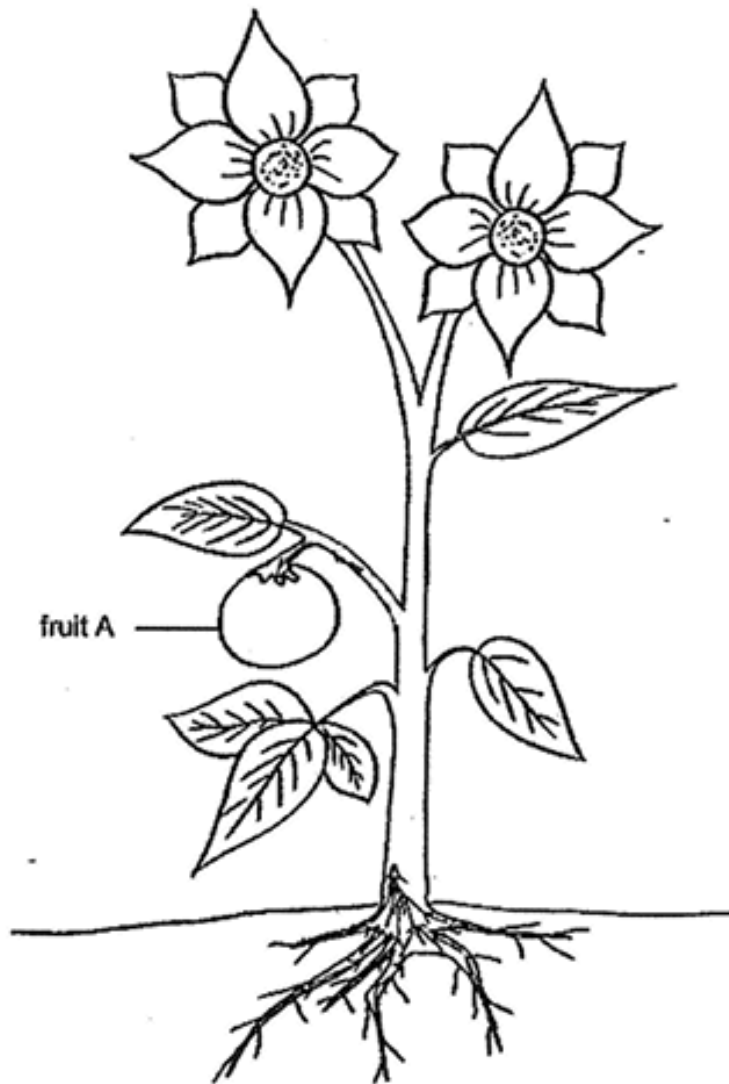


- (a) State the parts, AB, BC, CD or DE, of the graph that match the activities. [1]

Activity	Part of the graph
Running	
Brisk walking	

- (b) Explain why the Carine's heart rate decreases from C to D during her morning exercise. [2]

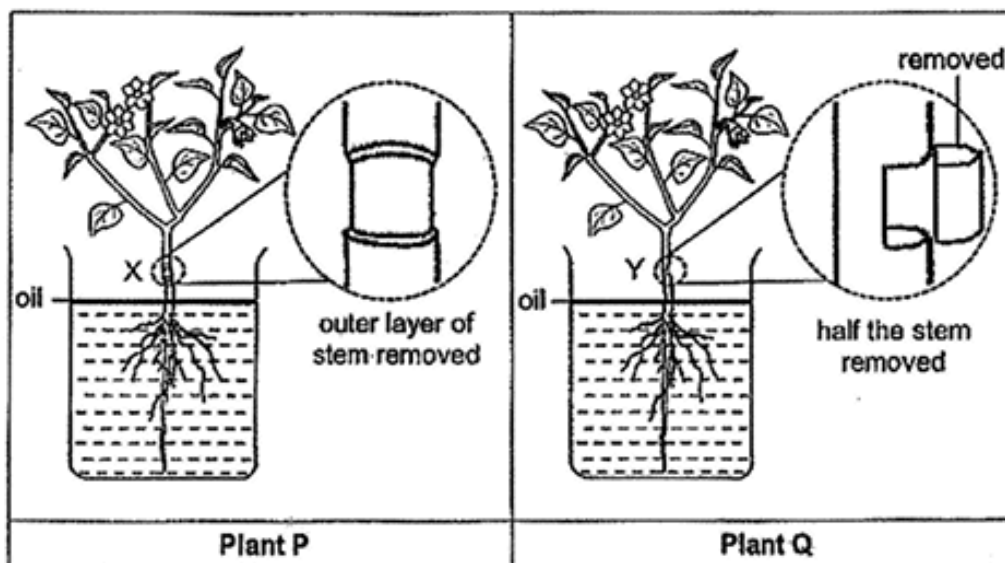
The diagram shows another plant found in Omar's garden.



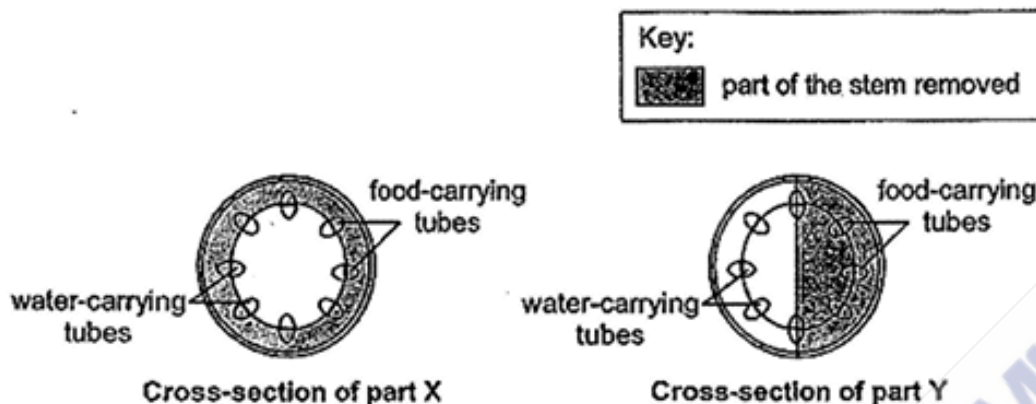
- (b) Draw arrows on the diagram above to show how water is transported to fruit A. [1]

37. Munah conducted an experiment using two similar plants, P and Q, and marked out two similar parts on the stem of each plant as shown in the diagrams.

At the similar part of the stems of plants P and Q, Munah made a cut. The outer layer of the stem at part X of plant P were removed, while half of the stem at part Y of plant Q was removed.

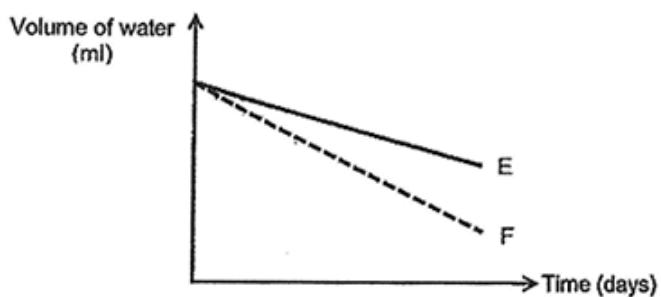


The cross-section of parts X and Y are as shown below.



He then placed them each in a beaker filled with water. He measured the amount of water in the beakers for a few days.

The volume of water in the beakers were recorded over a few days as shown in the graph.

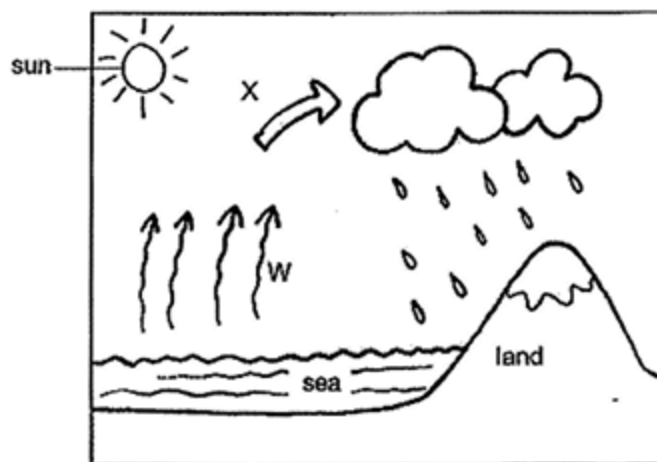


- (a) Which line, E or F, represents the change in volume of water in the beaker containing plant P? Explain your answer. [1]

After some time, one of the plants wilted and died.

- (b) Which plant, P or Q, wilted and died? Explain your answer. [2]

38. The diagram shows a water cycle.



Water cycle

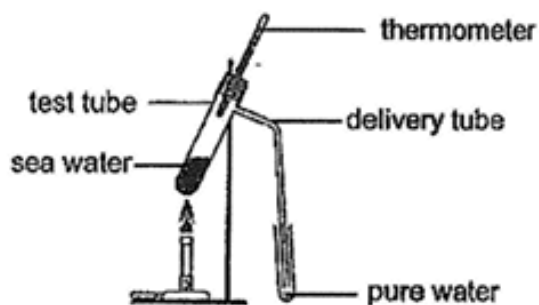
- (a) What processes do arrows W and X represent?

[1]

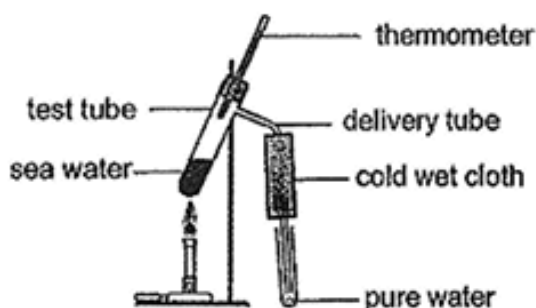
W: _____

X: _____

The diagram show set-up R that can be used to obtain pure water from sea water.



Set-up R



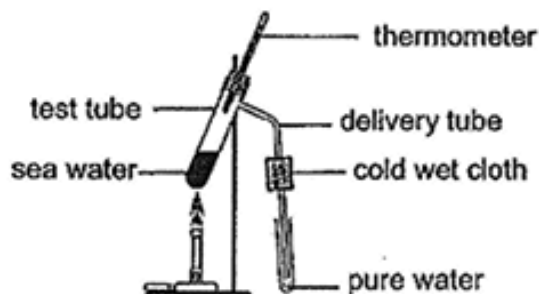
Set-up S

Rahman suggested wrapping the delivery tube with a cold wet cloth, as shown in set-up S, will increase the amount of pure water collected in the test tube over a period of two minutes.

(b) Do you agree with Rahman? Explain your answer.

[2]

The size of the cold wet cloth was changed as shown in set-up T. The temperature of the cold wet cloth remained the same.

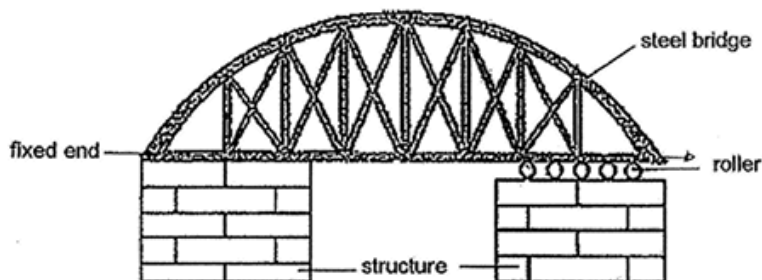


Set-up T

(c) Will the amount of pure water collected in the test tube over a period of two minutes increase, decrease or remain the same as compared to set-up S? Give a reason for your answer.

[2]

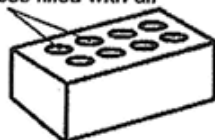
- 39 The diagram shows a steel bridge. One end of the bridge was fixed to the structure while the other end was mounted on rollers. The bridge was built this way so that the bridge will not break during a hot day.



- (a) Explain why one end of the steel bridge was not fixed to the structure? [2]

Bricks are used to build walls of houses. The diagram shows two different types of bricks of identical size and material.

hollow spaces filled with air



Hollow brick



Solid brick

The table shows the temperature of the surrounding air outside the house on a particular day.

	At 8am	At 12pm
Temperature of surrounding air outside the house (°C)	24	36

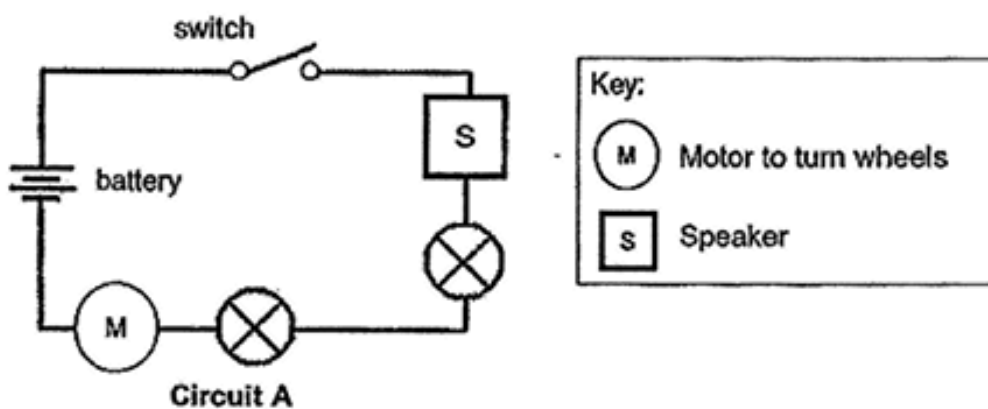
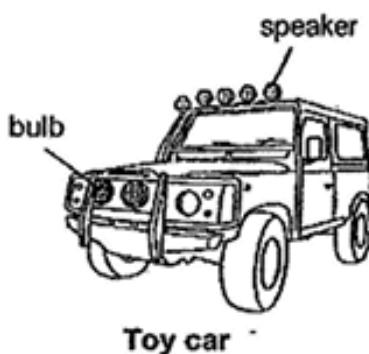
The walls of two identical houses were built using the different types of bricks.

The table records the temperature of air in the houses at 8am and 12pm respectively.

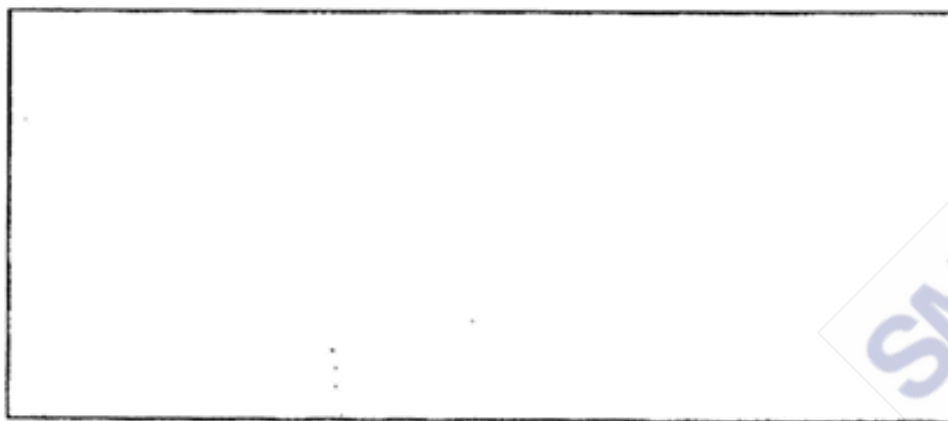
Type of brick used to make the walls	Temperature of air in the house at 8am (°C)	Temperature of air in the house at 12pm (°C)
Hollow brick	24	28
Solid brick	24	34

- (b) Using the data from the table, explain how using hollow bricks to build walls of houses helps to keep the house cooler on hot days. [2]

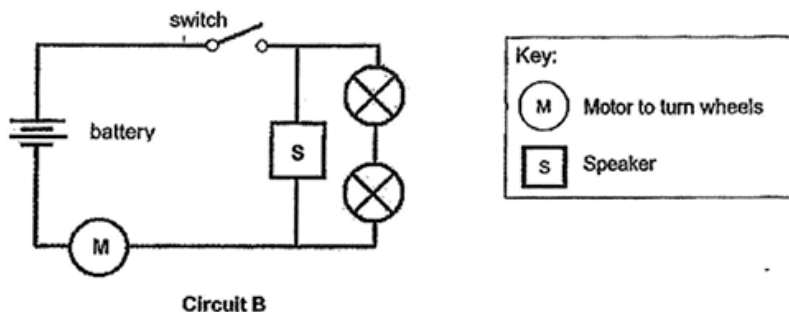
40. The diagram shows a toy car and circuit A which is found in the toy car.



- (a) In the box, using the same electrical components in circuit A, draw another circuit diagram that will increase the brightness of each of the bulbs. [2]

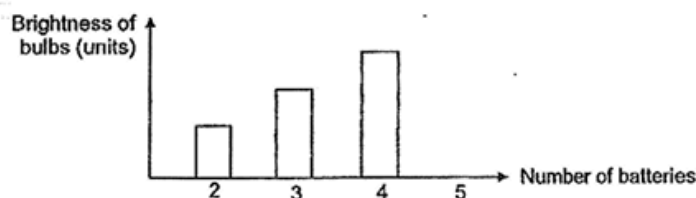


The same electrical components in the toy car are connected to form circuit B as shown.



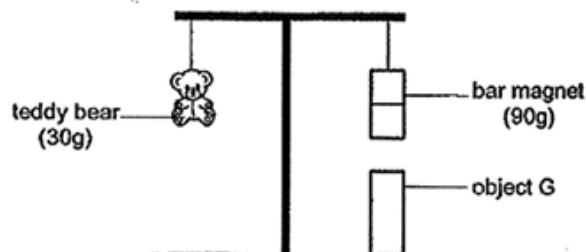
- (b) State an advantage of using circuit B. [1]

Using circuit B, Elijah decided to measure the brightness of the bulbs on the toy car with different number of batteries added to the circuit and record the result in the graph.



- (c) Based on the information above, what happened to the bulb when the 5th battery was added to the circuit. Give a reason for your answer. [1]

41. The diagram shows a teddy bear of mass 30g and a bar magnet of mass 90g on a balance. Object G was placed below the bar magnet. It was observed that the rod was balanced as shown in the diagram.



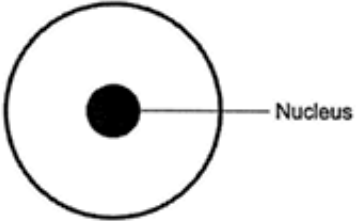
What could object G be? Explain your answer. [2]

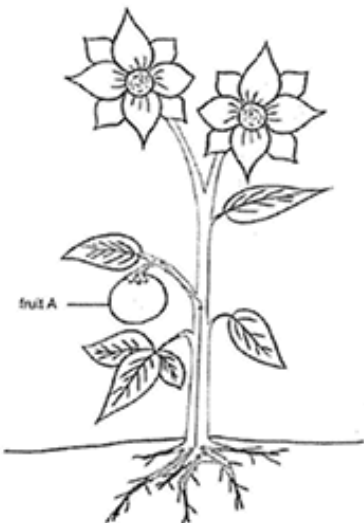
ANSWER SHEET

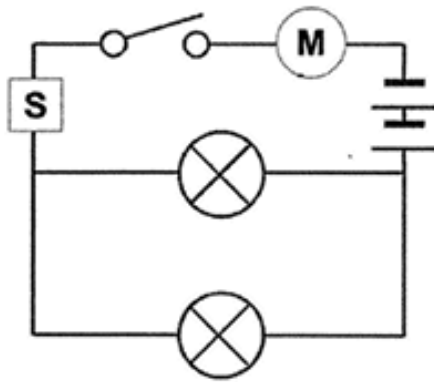
Q1	3
Q2	1
Q3	2
Q4	2
Q5	3
Q6	1
Q7	4
Q8	3
Q9	3
Q10	4
Q11	2
Q12	4
Q13	4
Q14	3

Q15	4
Q16	2
Q17	2
Q18	4
Q19	4
Q20	3
Q21	2
Q22	4
Q23	2
Q24	4
Q25	2
Q26	4
Q27	4
Q28	2

Q29 (a)	The process shown in the diagrams are fertilisation.
Q29 (b)	To increase the chances of the nucleus of the male sex cell (sperm) fusing with the nucleus of the female sex cell (egg).
Q29 (c)	(TICK) Both the pollen grains and sperms carry genetic information that can be passed down to their offspring.
Q30 (a)	(TICK) Y - Insect pollinated (TICK) X - Wind pollinated

Q30b)	(i) Flower Y has sweet, scented nectar. (ii) Flower Y has bright and colourful petals.
Q30c)	Part P will develop into a fruit after fertilisation
Q31a)	10 ml
Q31b)	The roots of the plant in Y was not coated with wax and there was a layer of oil on the water. Hence, roots of the plant in Y was able to absorb water, resulting in greater decrease in volume of water than X but less than Z, where there was a a greater decrease in water due to evaporation and absorption of water by plant.
Q31c)	Test tubes X and Y.
Q32a)	As the size of the food increases, the time taken to completely digest the food substance increases.
Q32b)	Chewing breaks the food into smaller pieces, increasing the exposed surface area of the food to digestive juices. Hence, the digestive juices can break down the food into simpler substances faster.
Q33a)	
Q33b)	Cell L: came from leaves of plant. Reason: has chloroplasts which contain chlorophyll that traps light to make food. Cell M: came from roots of plant. Reason: does not have chloroplasts but has a cell wall.
Q33c)	Cell membrane.
Q34a)	Human: B Fish: D
Q34b)	Water contains dissolved oxygen that enters the fish's mouth. Oxygen is absorbed into the blood as water passes through the gills.
Q35a)	Running: AB Brisk walking: BC

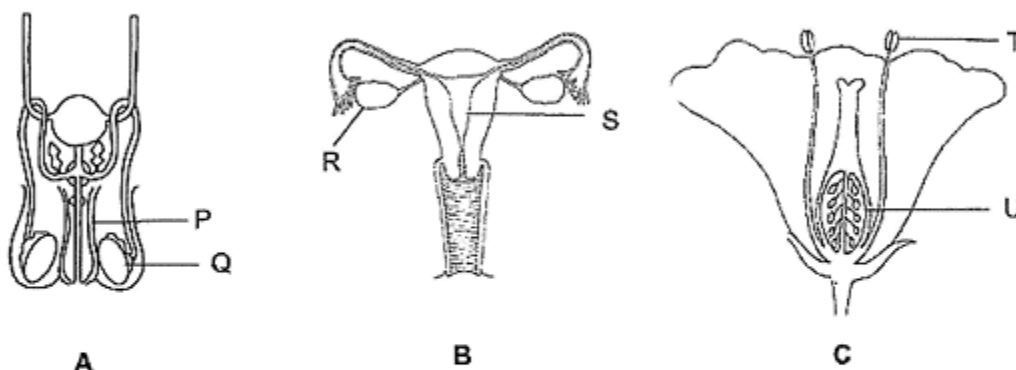
Q35b)	From C to D, Carine is slowing down. Thus, her heart rate decreases as her heart is pumping oxygenated blood to various parts of the body more slowly to release less energy required by the less intense activity.										
Q36a)	<table border="1"> <thead> <tr> <th>Observation</th><th>Tick (✓)</th></tr> </thead> <tbody> <tr> <td>Plant A dies</td><td></td></tr> <tr> <td>Plant B dies</td><td>✓</td></tr> <tr> <td>Plant C dies</td><td></td></tr> <tr> <td>Plant D dies</td><td>✓</td></tr> </tbody> </table>	Observation	Tick (✓)	Plant A dies		Plant B dies	✓	Plant C dies		Plant D dies	✓
Observation	Tick (✓)										
Plant A dies											
Plant B dies	✓										
Plant C dies											
Plant D dies	✓										
Q36b)											
Q37a)	Line F. All the water carrying tubes in plant P are present. However, half of the water-carrying tubes were removed in B. Hence, P is able to transport more water.										
Q37b)	Plant P. All of plant P's for carrying tubes were removed. Food made by the leaves could not be transported to all parts of the plant. The roots will die, thus there will be no roots to take in water and plant cannot make food without water.										
Q38a)	W: evaporation X: condensation										
Q38b)	Yes, I agree with Rahman. The seawater gains heat and evaporates into water vapour. The warmer water vapour will lose more heat to the cooler part of the delivery tube covered with the cold wet cloth and condense faster.										

Q38c)	It will decrease. The warmer water vapour is losing less heat to the smaller, cooler surface of the delivery tube covered with the smaller piece of cold, wet cloth. Hence, resulting in a slower rate of condensation.
Q39a)	The bridge gains heat and expands on hot days. When bridge expands, the roller allows the bridge to slide and move. This, bridge will not break or collapse.
Q39b)	The air in the hollow spaces of the hollow brick is a poor heat conductor. Hence, it conducts heat from the surrounding air outside to the house at a slower rate.
Q40a)	
Q40b)	The speaker will be louder in Circuit B than in A.
Q40c)	As the electrical current flows through the circuit, the filament of the bulb melted and the bulb fused. This forms an open circuit, preventing current from flowing.
Q41)	Object G could be a magnet. The like poles of the bar magnet and object G were facing each other, causing them to repel as like poles of magnets repel each other.

RAFFLES GIRLS' PRIMARY SCHOOL WA1 PAPER

For questions 1 to 6, write your answers clearly in the spaces provided.
 The number of marks is shown in brackets [] at the end of each question or part question.

1. The diagram below shows the parts of the reproductive systems A, B and C.



- (a) Identify the parts of the reproductive systems of B and C that produce the egg cell respectively. [1]

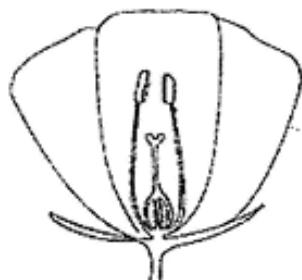
Reproductive System B: _____

Reproductive System C: _____

- (b) Compare the sexual reproduction process between systems B and C and state a similarity between them. [1]

- (c) State one similarity in the function between parts Q and T. [1]

2. The diagram below shows the cross section of flower X.

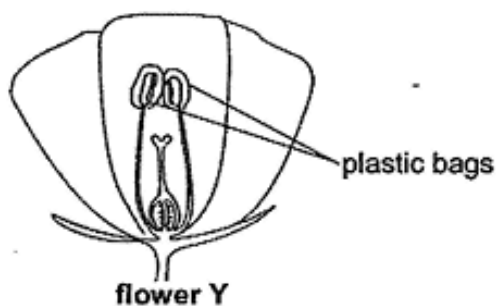


flower X

- (a) Based on your observation of flower X, explain why it is not pollinated by wind. [1]

- (b) Name the part of the flower that receive the pollen grains. [1]

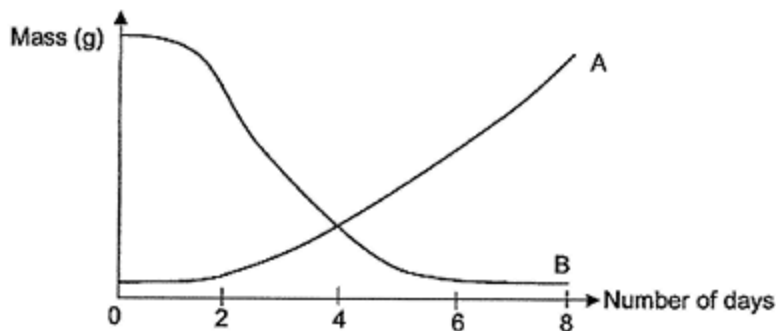
The diagram below shows the cross section of flower Y on the same plant. Some parts are covered with plastic bags as shown below.



flower Y

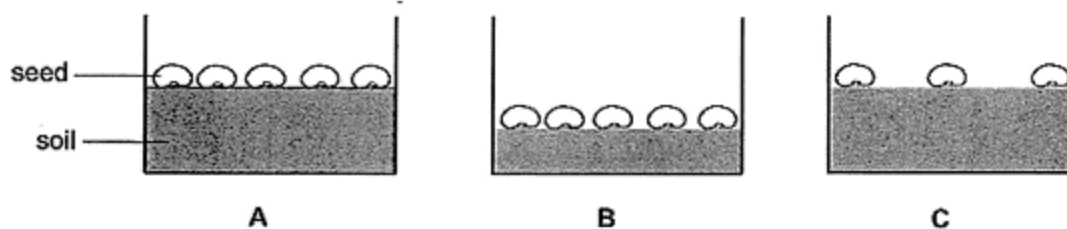
- (c) Mary commented that flower Y could develop into a fruit. Do you agree with her? Give a reason for your answer. [1]

3. Judy planted a seed of plant M into a pot of damp soil and observed its growth for eight days. She recorded the masses of the seed leaf and the shoot of the seedling over eight days and recorded the results as shown in the graph below.



- (a) Which line, A or B, shows the change in the mass of the seed leaf during the experiment? Explain your answer. [1]

Judy prepared three set-ups, A, B and C, using identical seeds from plant M as shown in the diagram below. She wanted to find out if the number of seeds will affect the growth of the germinating seeds.



(b) Identify the following variables: [2]

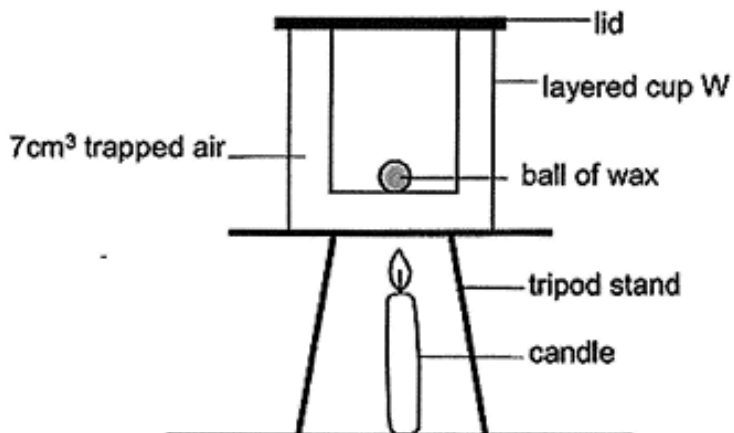
(i) Independent variable(changed variable):

(ii) Dependent variable:

(c) Which set-ups should she use in order to conduct a fair test? [1]

(d) State another variable that must be kept the same to ensure a fair test. [1]

4. Sam prepared an experimental set-up as shown below. He heated a ball of wax in a layered cup with 7cm^3 of air trapped in between the layers. He repeated the experiment with different amounts of trapped air.

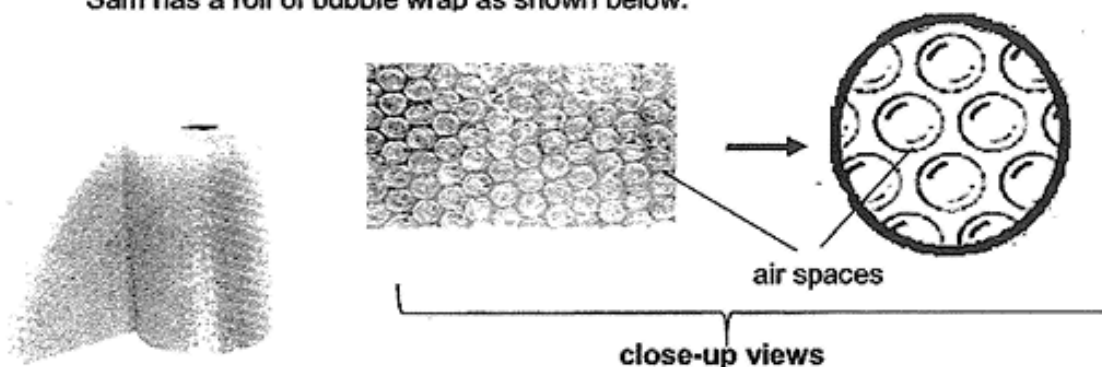


His results are shown in the table below.

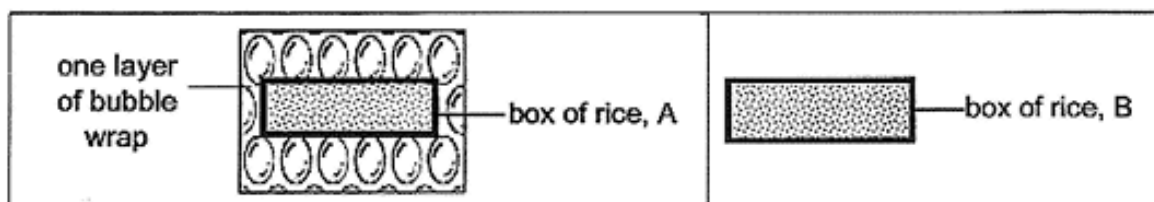
amount of trapped air (cm^3)	time taken for the wax to melt completely (s)
7	40
16	100
55	220

- (a) Based on the information above, what is the relationship between the amount of trapped air and the time taken for the wax to melt completely? [1]

Sam has a roll of bubble wrap as shown below.



Sam had two identical boxes of hot rice, A and B, at a temperature of 60°C . He wrapped one of the boxes of rice with one layer of bubble wrap and left both boxes on the table as shown in the diagram below.



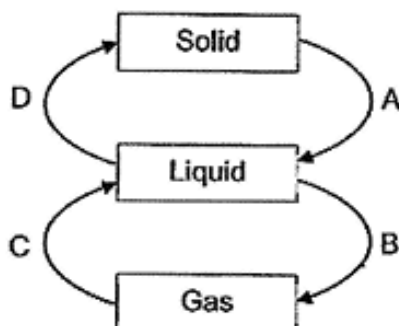
He recorded the change in the temperature of the boxes of rice in the result table below.

box of rice	temperature of box of rice ($^{\circ}\text{C}$)	
	at first	after 10 minutes
A	60	57
B	60	50

- (b) Explain why the box of hot rice, A, in bubble wrap had a smaller decrease in temperature after ten minutes. [2]

- (c) Using the same box of hot rice, A at 60°C , as shown in the diagram above, and the roll of bubble wrap, suggest one way Sam could do to keep the box of hot rice, A, warm for a longer time. Explain your answer. [2]

5. The diagram below shows the different states of water. A, B, C and D represent the processes when water changes from one state to another.



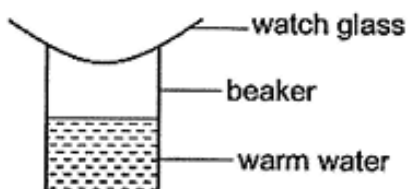
- (a) Identify the processes that takes place at A and B.

[1]

Process A: _____

Process B: _____

Observe the set-up below carefully.



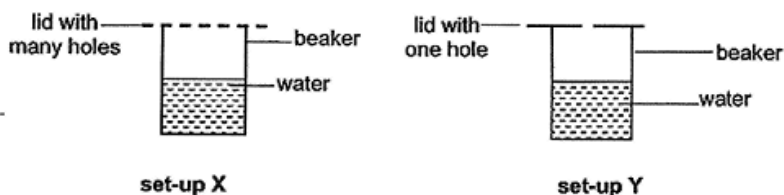
Water droplets were observed on the underside of the watch glass after five minutes.

- (b) Name the process that took place for the above observation. Explain your answer.

[2]

Continued from previous page

Sarah prepared two identical beakers filled with the same amount of water at 80°C . She covered both beakers with lids as shown in the diagram below.



After five minutes, she observed that there was less water in one of the beakers.

- (c) Which set-up, X or Y, would have less water left in the beaker? Explain your answer. [2]

6. The table below shows the melting and boiling points of four substances, A, B, C and D.

substance	melting point ($^{\circ}\text{C}$)	boiling point ($^{\circ}\text{C}$)
A	-114	78
B	0	100
C	113	184
D	221	685

- (a) Based on the information above, write down the states, **solid**, **liquid** or **gaseous**, of substances B and C at 120°C respectively. [2]

substance	state of substance at 120°C
B	
C	

Amy placed the same amount of substances A, B, C and D on identical dishes. She placed them in a room with a temperature of 30°C . She observed that one of the substances disappeared completely after five minutes.

- (b) Which substance, A, B, C or D, would likely disappear after five minutes? Explain your answer. [2]

ANSWER SHEET

1) a) Reproductive System B : R
Reproductive System C : U

b) Both processes involve the fusion of male and female reproductive cells during fertilisation.

c) They both produce the male reproductive cell.

2) a) The stigma and anthers of the flower are not hanging out of the flower.

b) Stigma.

c) Yes I agree. The stigma is still present to receive pollen grains from another flower for pollination to occur and result in fertilisation to develop into a fruit.

3) a) B. After a period of time, the seed leaf will decrease in mass as it supplied food to the seedling for germination. The seedling will grow its true leaves and it does not need to depend on the seed leaves for food.

b) i) The amount of seeds in each set-up.

ii) The height of seedling.

c) A and C

d) The amount of soil.

- 4) a) The more the amount of trapped air, the longer the time taken for the wax to melt completely.
- b) Air is a poor conductor of heat, allowing the box of hot rice to lose heat from its surroundings slower. Hence there is a smaller decrease in temperature after ten minutes.
- c) Increase the number of layers of bubble wrap around the rice box. There will be more air spaces that trap more air which to conduct heat from the hot rice to the cooler surrounding air more slowly.
- 5) a) Process A : Melting
Process B : evaporation
- b) Condensation. The warm water gained heat, evaporated and turned into water vapour. The hotter water vapour lost heat and condensed on the cooler inner surface of the watch glass water vapour are formed.
- c) Set-up X. When hot water in the beaker evaporated into water vapour, more water vapour comes into contact with the smaller surface area of the cooler lid and condensed into less water droplets to fall back into the beaker.
- 6) a) B : Gaseous
C : Liquid
- b) Substance A. It has the lowest boiling point and thus it will evaporate the fastest.
The temperature difference between the boiling point and the room temperature is the least.

RED SWASTIKA SCHOOL EOY PAPER

- 1 In the table below, A, B and C represent the characteristics of the given animals. A tick (✓) shows that the characteristic is present.

Animal	Characteristics		
	A	B	C
eagle	✓	✓	✓
snake		✓	
butterfly		✓	✓

Which of the following characteristics do A, B and C represent?

	A	B	C
(1)	Has scales	Can fly	Has legs
(2)	Has scales	Lays eggs	Can fly
(3)	Has feathers	Can fly	Has legs
(4)	Has feathers	Lays eggs	Can fly

- 2 Olivia found an animal in a stream deep in a forest.

Which of the following characteristics should she use to identify the animal as a/an amphibian, fish or reptile?

- (1) presence of gills
- (2) type of body covering
- (3) method of reproduction
- (4) whether it can live on both land and water

- 3 Kai He was choosing a material for part X of his running shoes, as shown in the diagram below.

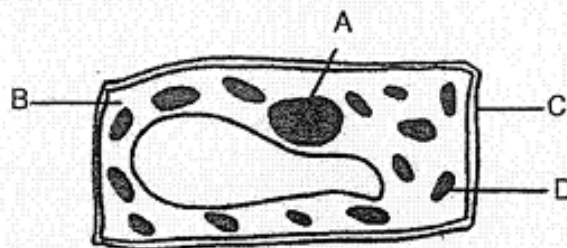


Which properties should he consider when choosing the material for part X?

- A: flexibility
- B: waterproof
- C: ability to allow light to pass through
- D: ability to float on water

- (1) A and B only
 - (2) B and C only
 - (3) A and D only
 - (4) A, B and D only
- 4 Which of the following systems breaks down food into simple substances?
- (1) Skeletal system
 - (2) Muscular system
 - (3) Digestive system
 - (4) Circulatory system

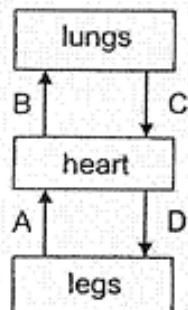
5 The diagram shows a plant cell.



Which parts are not found in an animal cell?

- (1) A and B only
- (2) C and D only
- (3) B and D only
- (4) A and C only

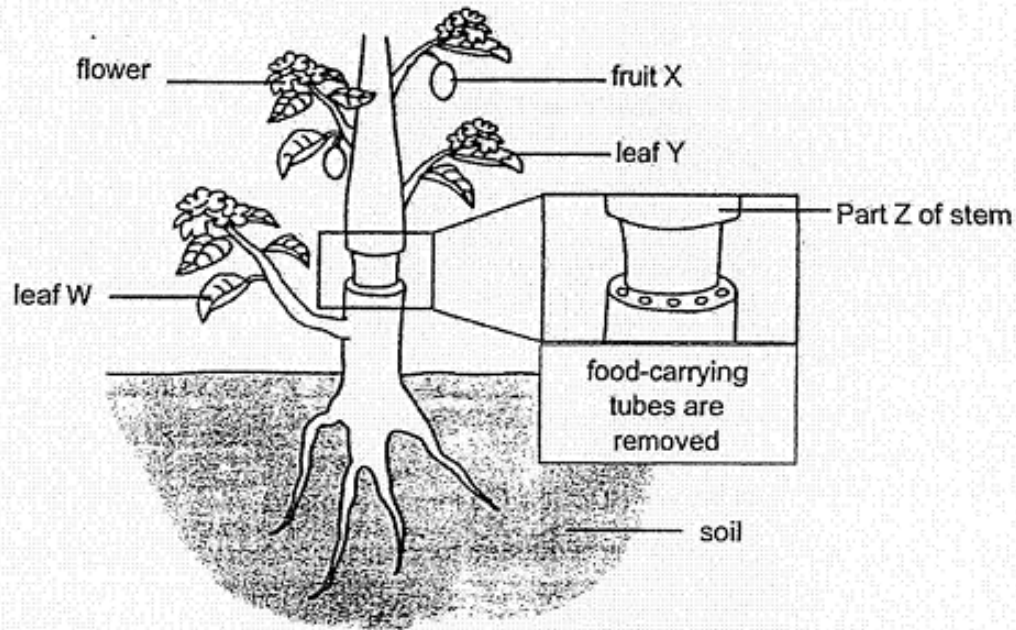
6 The diagram below shows how blood is circulated in our body.



Which blood vessels transport blood rich in carbon dioxide?

- (1) A and B
- (2) A and C
- (3) B and C
- (4) C and D

- 7 Sanji removed the food-carrying tubes from the stem of a plant shown below. The water-carrying tubes remained in the stem.

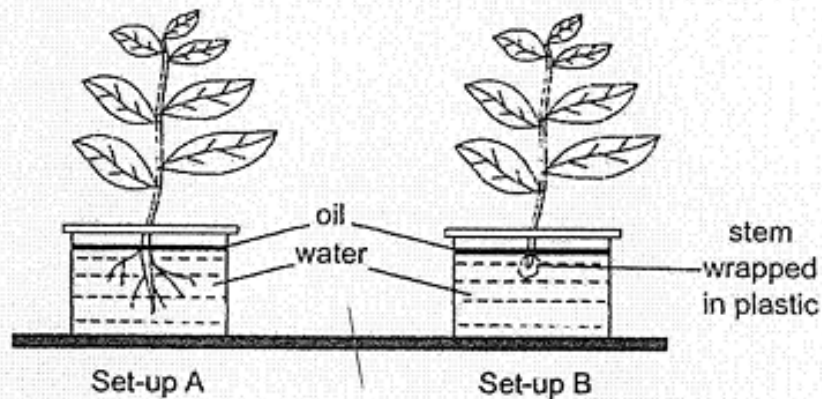


After some time, he observed some changes in the plant.

Which of the following is correct?

- (1) Leaf W died as no food was transported to it.
- (2) Leaf Y remained green as the leaf was still able to make food.
- (3) Fruit X became bigger than normal as more water was stored there.
- (4) Part Z of the stem was slightly swollen as water could not be transported from the stem to the roots.

- 8 Zoro conducted an experiment as shown below. Both set-ups A and B contained the same volume of water and were placed next to a window.

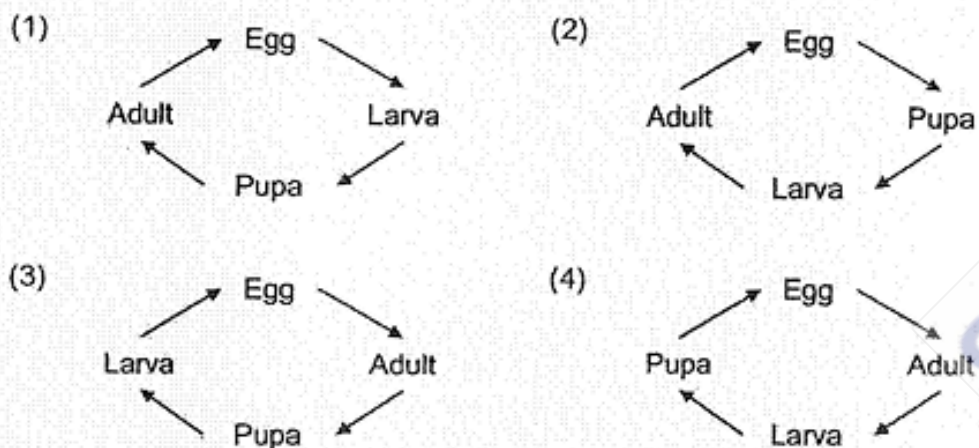


At the end of three days, Zoro observed that more water was left in set-up B.

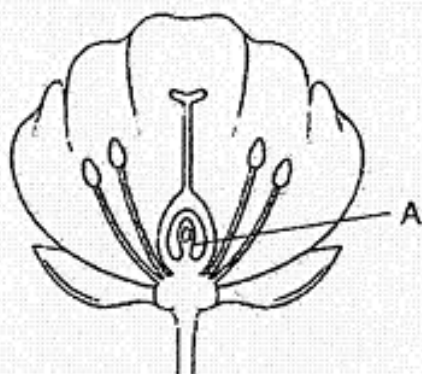
What is the aim of the experiment?

- (1) To find out if oil is needed for plants to survive.
- (2) To find out if air is needed for plants to photosynthesise.
- (3) To find out if roots are needed for plants to absorb water.
- (4) To find out if presence of light affects the growth of plants.

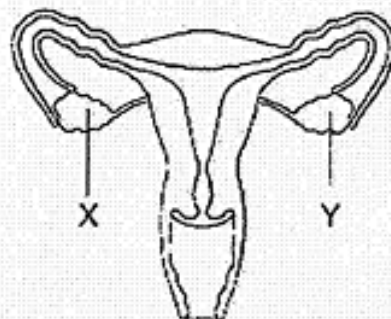
- 9 Which of the following diagrams correctly represents the life cycle of a butterfly?



10 Study the plant and human reproductive systems as shown below.



plant reproductive system

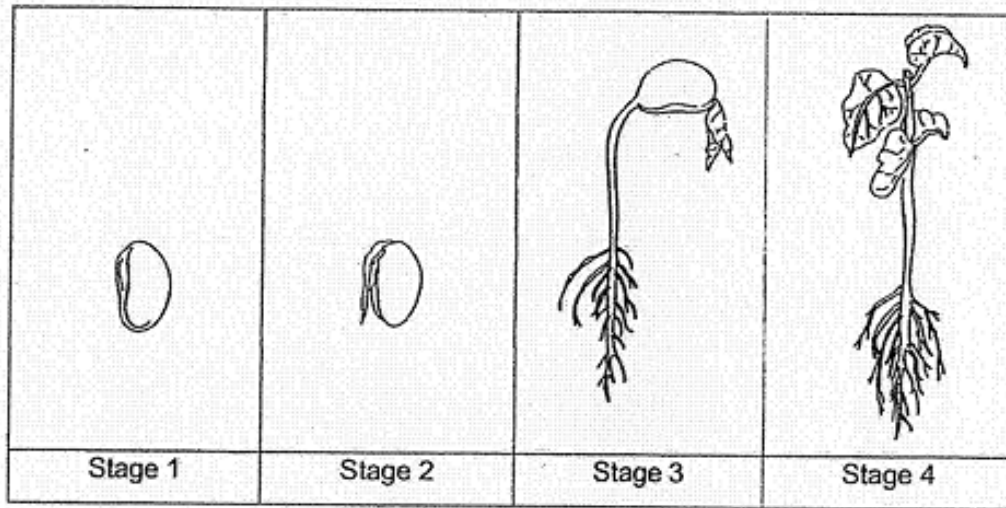


human reproductive system

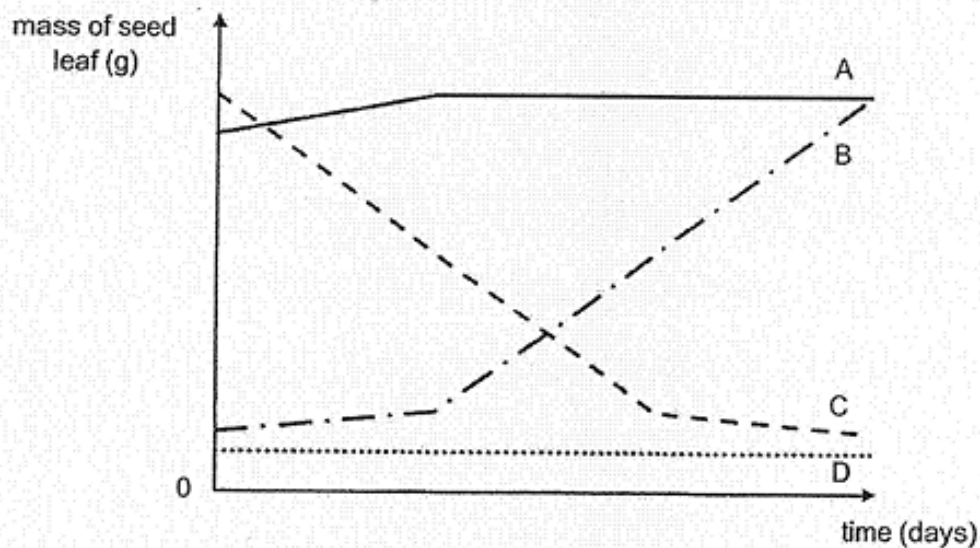
Which one of the following statements is true?

- (1) If part X is removed, fertilisation will not be able to occur.
- (2) If part A is removed, fertilisation will not be able to occur.
- (3) Only parts X and Y produce female reproductive cells in both systems.
- (4) Parts A, X and Y produce the male reproductive cells in both systems.

*11 The diagram below shows four different stages of growth of a bean plant.



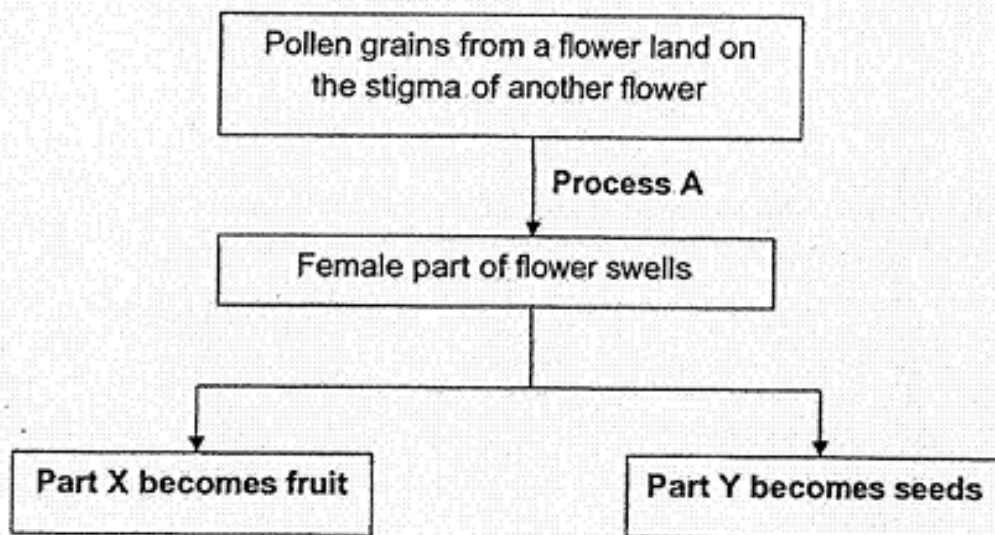
The graph shows the change in mass of a seed leaf as the plant grows.



Which of the following graphs, A, B, C and D, correctly shows the change in mass of the seed leaf as the plant grows from stage 1 to 4?

- (1) A
- (2) B
- (3) C
- (4) D

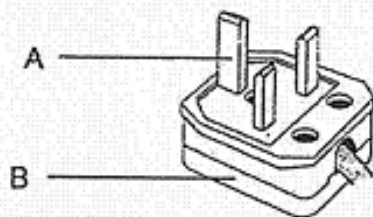
12 Study the diagram below.



Which of the following correctly represents process A, part X and part Y?

	Process A	Part X	Part Y
(1)	Germination	Ovary	Ovules
(2)	Fertilisation	Ovary	Ovules
(3)	Germination	Ovules	Ovary
(4)	Fertilisation	Ovules	Ovary

- 13 The picture below shows an electrical plug with parts labelled A and B.

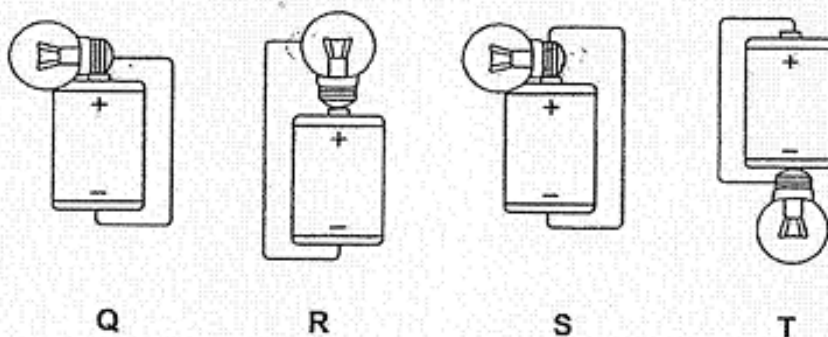


an electrical plug

Which of the following correctly represents the parts labelled A and B?

	A	B
(1)	conductor of electricity	insulator of electricity
(2)	insulator of electricity	insulator of electricity
(3)	conductor of electricity	conductor of electricity
(4)	insulator of electricity	conductor of electricity

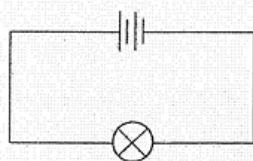
- 14 Identical batteries and bulbs are used to set up the four circuits as shown below.



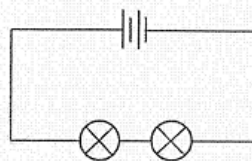
In which of the two electrical circuits will the bulb light up?

- (1) Q and R
- (2) R and S
- (3) Q and T
- (4) S and T

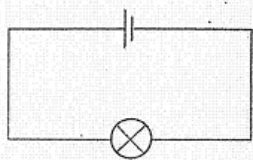
- 15 Siti set up four circuits, A, B, C and D, as shown below. She wanted to find out if the arrangement of bulbs in a circuit affects the brightness of the bulb(s).



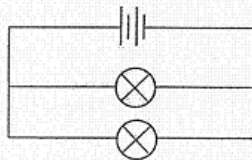
circuit A



circuit B



circuit C

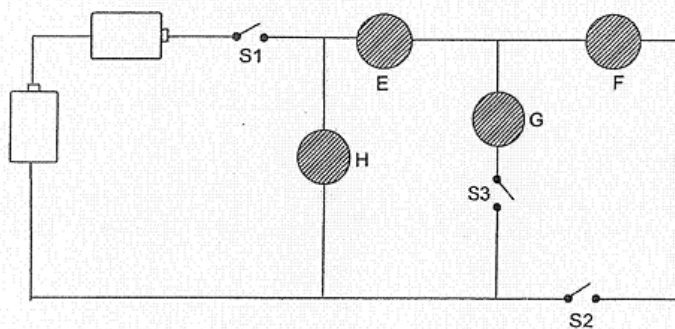


circuit D

Which two circuits should she use for her investigation?

- (1) A and C
- (2) B and D
- (3) B and C
- (4) C and D

- 16 Peter constructed an electrical circuit as shown below. He used two identical batteries, three identical switches and four objects, E, F, G and H. One of the objects used was a light bulb.



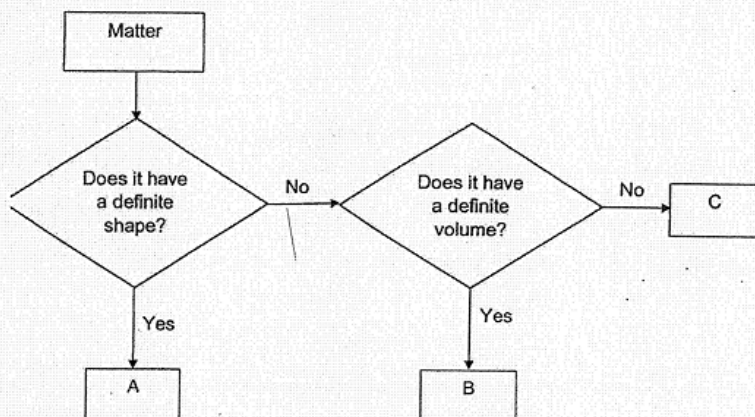
Peter made the following observations when he closed some switches.

Switches that are closed	Observations
S1 and S3	bulb lighted up
S1 and S2	bulb did not light up

Which object is the light bulb?

- (1) E
- (2) F
- (3) G
- (4) H

17 The flowchart below is used to classify three types of matter, A, B and C.

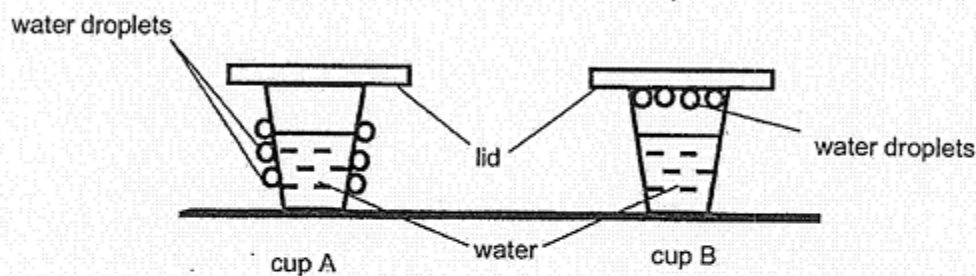


Which of the following correctly represents matter, A, B and C?

	A	B	C
(1)	oil	book	ice
(2)	ice	oil	air
(3)	ice	oil	book
(4)	oil	book	air

- 18 Sally poured the same amount of water into two cups, A and B, and placed a metal lid over each cup. The cups were left on a kitchen table. After half an hour, she observed the following as shown in the diagrams below.

Room temperature at 30 °C



Which of the following shows the most possible temperature of the water in cups A and B?

	Temperature of water (°C)	
	cup A	cup B
(1)	80	10
(2)	80	80
(3)	10	80
(4)	10	10

- 19 Tommy filled a measuring cylinder with 100 cm^3 of water. He placed three objects, X, Y and Z into it, as shown in Diagram A. He removed the objects one by one. He measured and recorded the volume of water in the cylinder after each object was removed as shown in Diagrams B and C below.

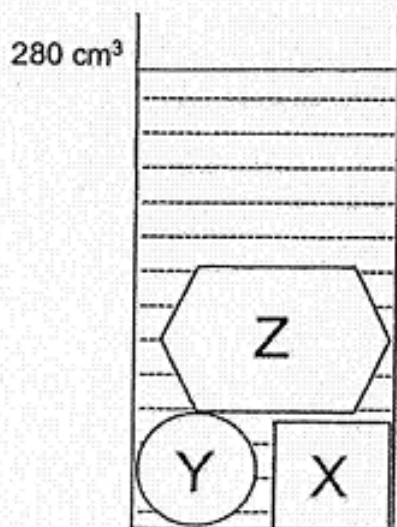


Diagram A

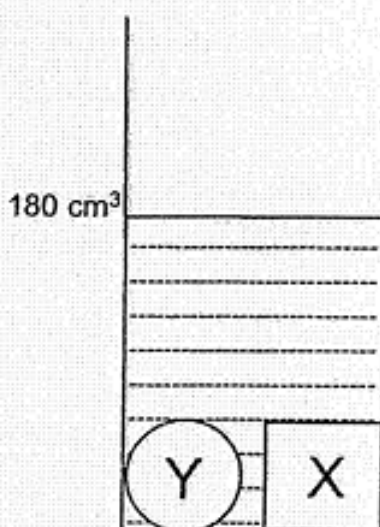


Diagram B

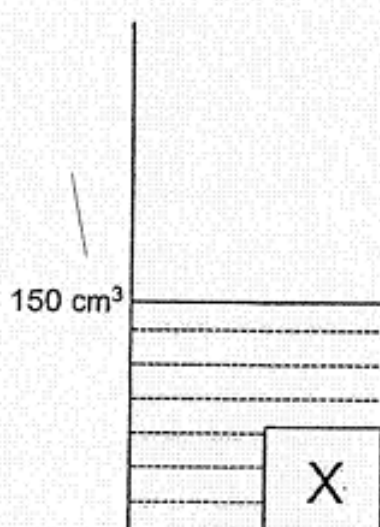


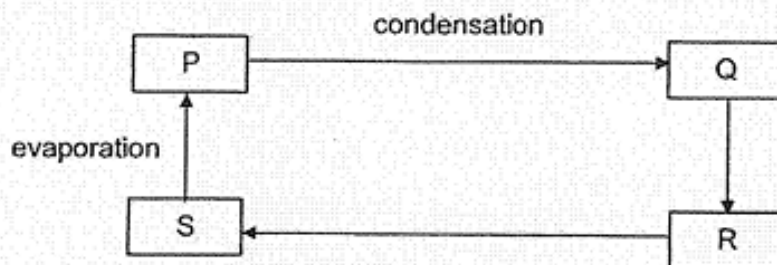
Diagram C

Based on the diagrams, which of the following statement(s) is/are true about X, Y and Z?

- A: Object Z occupied most amount of space.
- B: Object X occupied less space than object Y.
- C: Objects Z and Y each occupied the same amount of space.

- (1) A only
- (2) B only
- (3) A and C only
- (4) B and C only

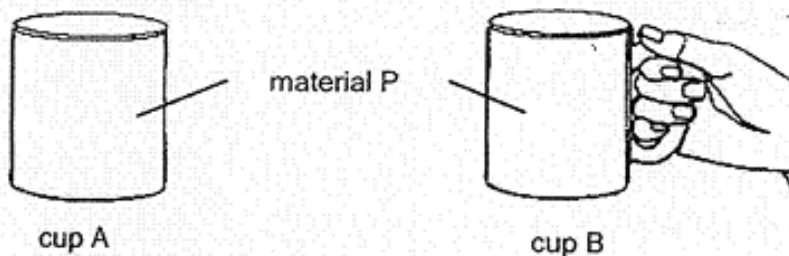
20 Study the diagram of the water cycle below.



What do the letters, P, Q, R and S, represent?

	P	Q	R	S
(1)	rain	water bodies	clouds	water vapour
(2)	water bodies	water vapour	clouds	rain
(3)	clouds	rain	water bodies	water vapour
(4)	water vapour	clouds	rain	water bodies

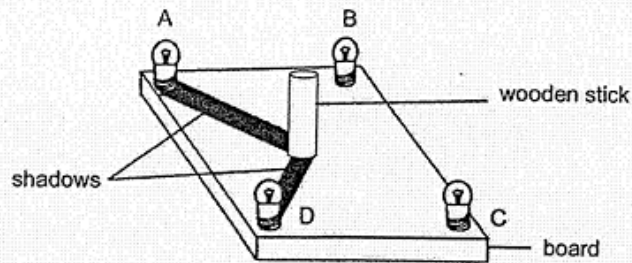
21 Ariel has two cups, A and B made of material P. She poured an equal amount of hot water into each cup. Ariel noticed that it was too hot for her to hold cup A but she could hold cup B easily as shown below.



Which of the following best explains why Ariel can hold cup B easily but not cup A?

- (1) Cup B is a poor conductor of heat.
- (2) Cup A is a good conductor of heat.
- (3) Distance of heat source to her hand is greater in cup A.
- (4) Distance of heat source to her hand is greater in cup B.

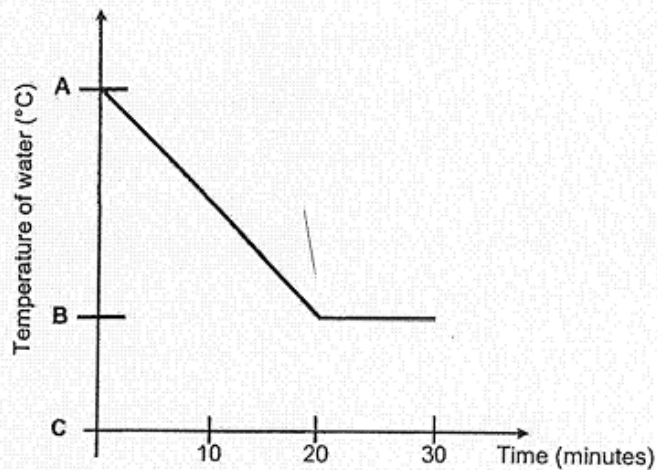
- 22 Harun conducted an experiment in a dark room. He lighted up two bulbs and the shadows were formed as shown in the diagram below.



Which two bulbs, A, B, C or D, should Harun light up to cast the shadows as shown above?

- (1) A and B
- (2) C and D
- (3) A and D
- (4) B and C

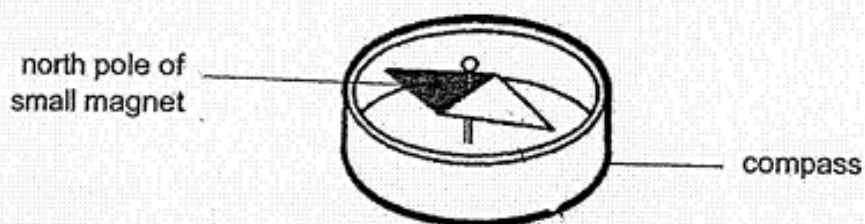
- 23 A container of water was left in a room for 30 minutes. The temperature of the water was recorded every 10 minutes as shown in the graph below.



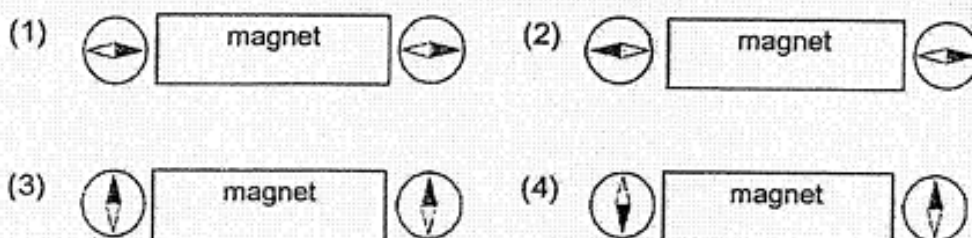
Based on the graph, which of the following statements is correct?

- (1) A is the temperature of the room.
- (2) B is the temperature of the room.
- (3) C is the temperature of the room.
- (4) C is the temperature of the water.

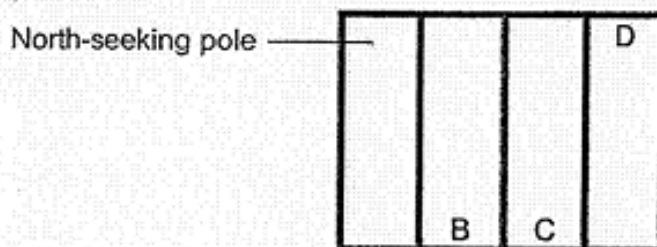
- 24 A compass has a small magnet that can rotate freely as shown. Two compasses were placed near both ends of a magnet.



Which diagram show the directions of the needles in the compasses?



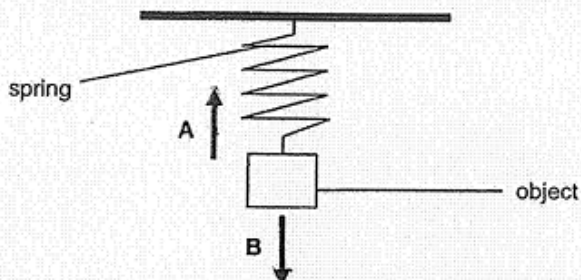
- 25 Farhana put four identical magnets side by side as shown below.



Which of the following correctly represents the poles at B, C and D?

	B	C	D
(1)	South-seeking pole	North-seeking pole	North-seeking pole
(2)	North-seeking pole	North-seeking pole	North-seeking pole
(3)	North-seeking pole	South-seeking pole	South-seeking pole
(4)	South-seeking pole	South-seeking pole	South-seeking pole

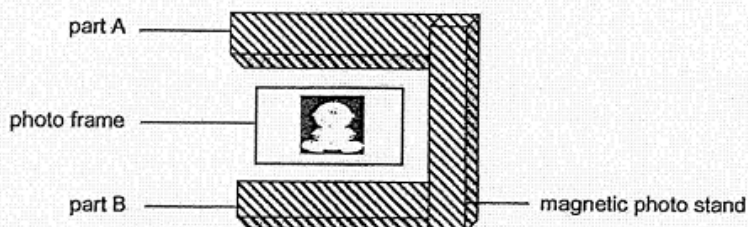
- 26 An object is attached to a spring as shown below. Forces, A and B are acting on the object as shown below.



Which of the following correctly represents the types of forces A and B?

	A	B
(1)	magnetic force	gravitational force
(2)	elastic spring force	gravitational force
(3)	gravitational force	frictional force
(4)	frictional force	magnetic force

- 27 The diagram below shows a magnetic photo stand where the photo frame was suspended in the air between parts A and B.

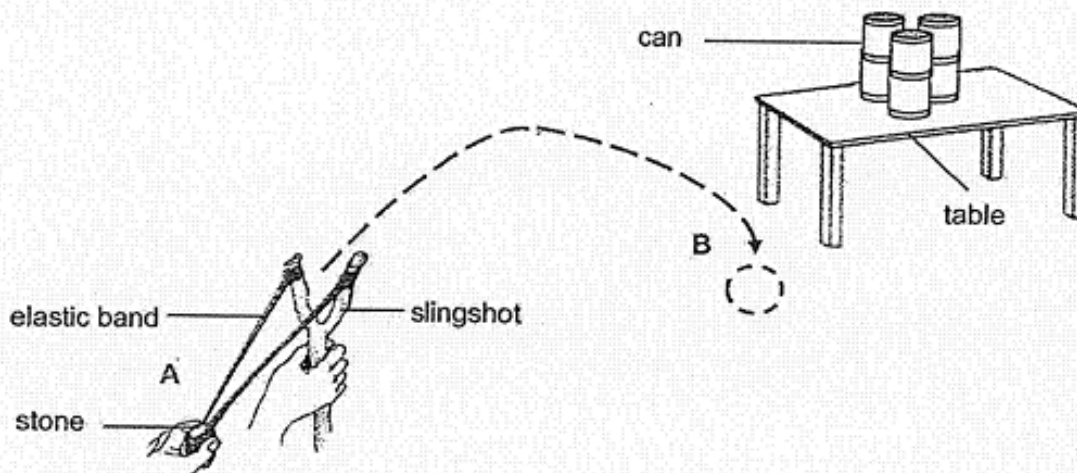


Which of the following statements explain why the photo frame could be suspended in the air between parts A and B?

- A There was magnetic force acting on the frame.
- B There was elastic spring force acting on the frame.
- C There was no gravitational force acting on the frame.
- D The magnetic force acting on the frame was greater than the gravitational force acting on it.

- (1) A and C only
- (2) C and D only
- (3) B and C only
- (4) A and D only

28 Coen wanted to use a slingshot to hit the cans as shown below.



When Coen pulled back the elastic band and then released the stone at point A, the stone moved along the dotted line as shown above. The stone dropped on the ground at point B.

Which of the following is/are possible explanations for the observation?

- A: The elastic band was not stretched long enough.
- B: Gravitational force pulled the stone down to the ground.
- C: Frictional force between the stone and elastic band pulled the stone down.

- (1) A only
- (2) B and C only
- (3) A and B only
- (4) A, B and C

End of Booklet A

Answer all the questions in the spaces provided.

- 29 The diagram below shows a grasshopper.



grasshopper

- (a) Which group of animals should grasshoppers belong to? Explain your answer. (2m)

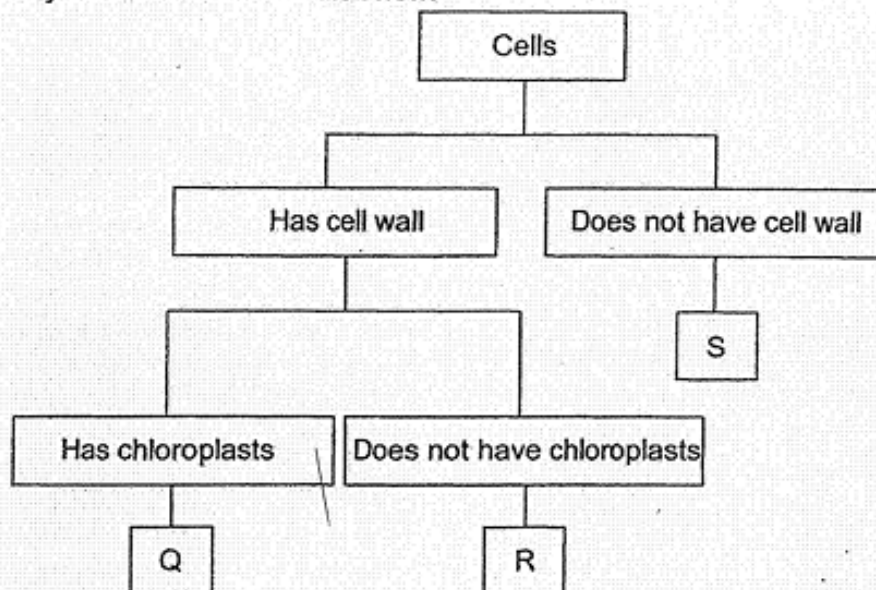
George conducted an experiment to find out if the presence of water affects the survival of grasshoppers.

- (bi) Put a tick (✓) beside the variable(s) that George kept the same for a fair test. (1m).

	Variable	To be kept the same
(i)	Presence of water	
(ii)	Location of tanks placed	
(iii)	Number of grasshoppers in each tank	
(iv)	Number of days that the grasshoppers are kept in the tank	

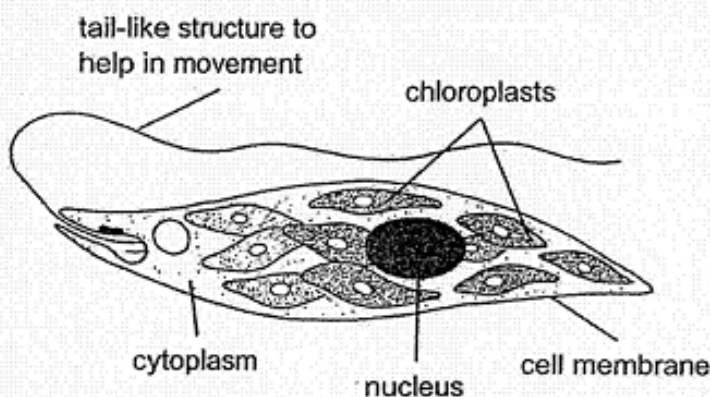
- (bii) Explain why the variable(s) in (bi) should be kept the same. (1m)

30 Study the classification chart below.



- (a) Based on the chart above, which cell, Q, R or S, is most likely a root cell? Explain why. (2m)

Bala found a single-celled organism that lives in freshwater ponds as shown below.



- (b) Based on the diagram, explain how the organism can make its own food. (1m)

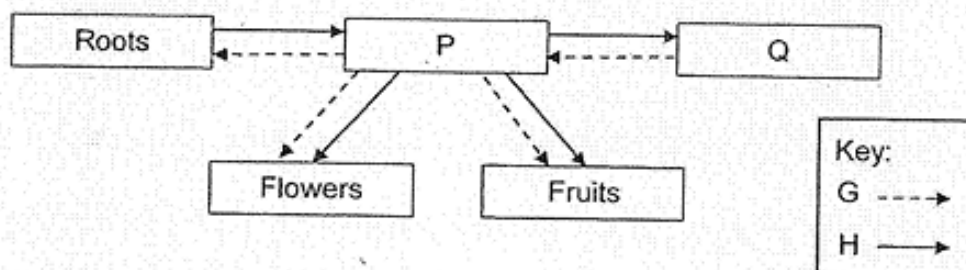
- 31 A headache can be felt by an individual when there is less oxygen being transported to the brain.

While having a headache, Jake realised that his heartbeat was faster.

- (a) Explain why the heart pumps faster when Jake gets a headache. (2m)

- (b) Other than the substance mentioned in part (a), what is another substance transported by the blood? (1m)

- 32 The diagram below shows how substances are transported in a plant. P and Q represent different parts of the plant. The arrows represent the movement of substances G and H.



- (a) Identify substances G and H. (1m)

G _____

H _____

- (b) Identify part P and describe its role in the plant. (2m)

33 Bees are often found near flower N.



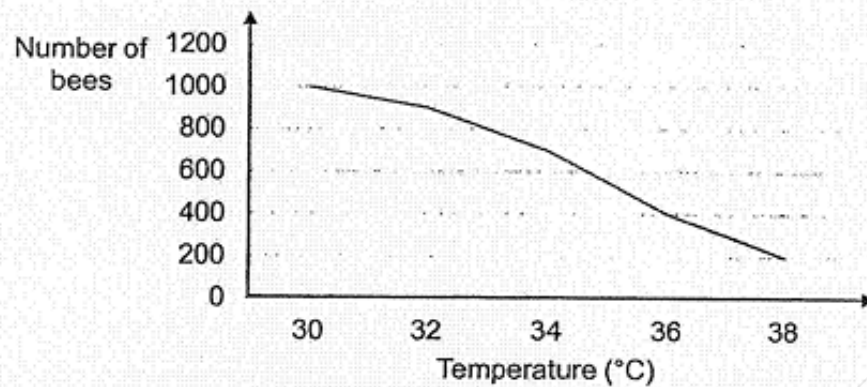
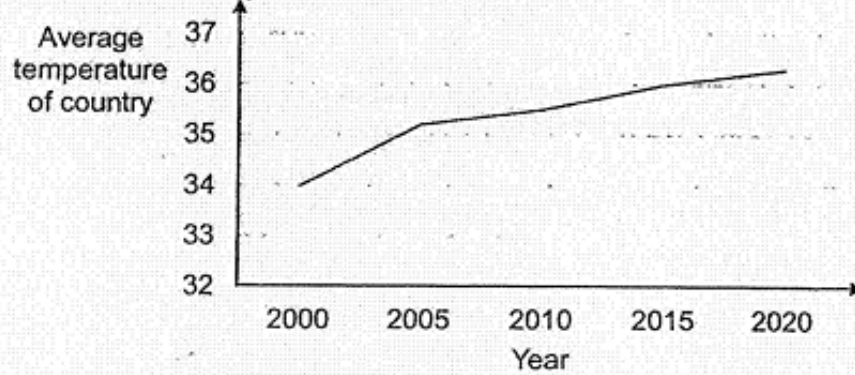
bee



flower N

(a) Describe how bees help plants reproduce. (1m)

The graphs below show the average temperature of a country over 20 years and the effect of temperature on the number of bees.

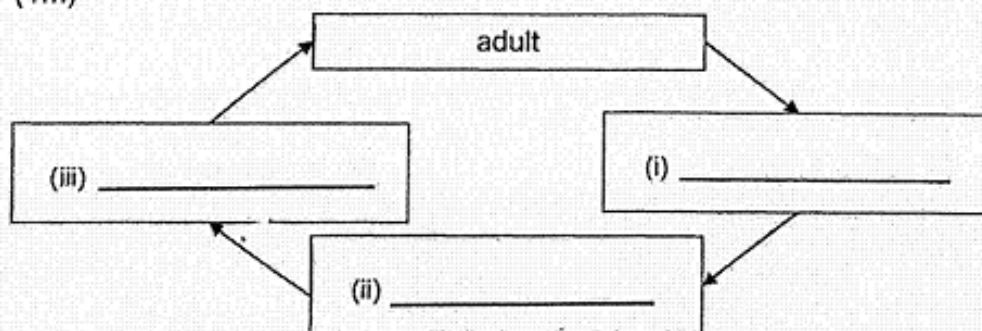


(bi) What is the relationship between the temperature of the country and the number of bees? (1m)

(bii) Based on the information above, what would happen to the population of plant N from year 2000 to 2020. Explain why. (2m)

34 Dengue is a disease caused by the dengue virus which is transmitted to humans through the bite of an Aedes mosquito.

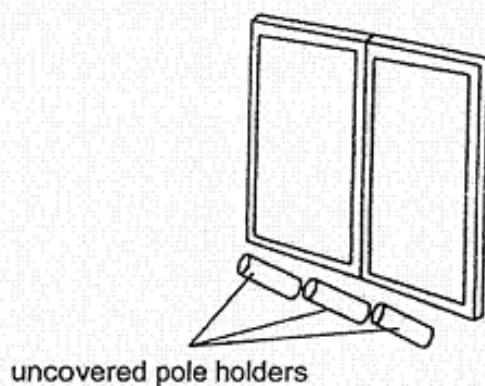
(ai) Name the correct stages in the life cycle of a mosquito in the blanks below. (1m)



(aii) At which stage of its life cycle does the mosquito not live in water? (1m)

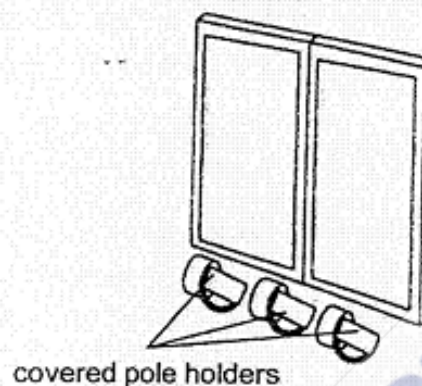
(b) In some houses, pole holders are fixed outside the kitchen windows. These are used to hold bamboo poles where wet clothes are hung on them to dry. The bamboo poles were then inserted into the pole holders.

The diagrams below show examples of an uncovered and a covered bamboo pole holders found outside the kitchen windows of Lilin's house and Brook's house.



uncovered pole holders

Lilin's house



covered pole holders

Brook's house

- (i) Lilin found more mosquitoes in her house than in Brook's house. Explain why. (2m)

To reduce the number of mosquitoes in the country, Country S has designed a trap to attract and capture female adult mosquitoes that are looking for places to lay their eggs. Once they enter this trap, the adult female mosquitoes will not be able to escape.

- (ii) Suggest why this trap reduces the number of mosquitoes in Country S. (1m)

- 35 Eric set up an electrical circuit as shown in Diagram 1 below. All the circuit components are working.

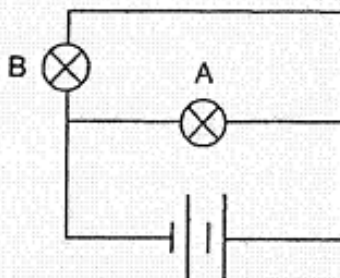


Diagram 1

- (a) Name the type of arrangement of bulbs A and B in diagram 1. (1m)

- (b) If bulb B fuses, will bulb A continue to light up? Explain why. (2m)

Next, Eric added bulbs C and D in the circuit as shown in diagram 2 below. All four bulbs are identical and in working condition.

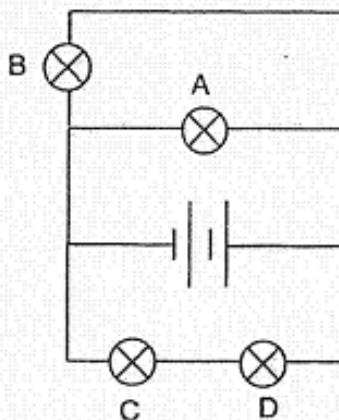
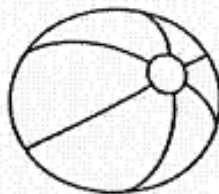


Diagram 2

- (c) Two switches are added to the circuit. When these two switches are open, only bulb B lights up. In the circuit diagram above, draw the positions of the two switches with a letter 'X'. (2m)

- 36 Wei Xuan pumped air into a beach ball as shown below.



Wei Xuan found that she can continue to pump air into the beach ball even when it is fully inflated.

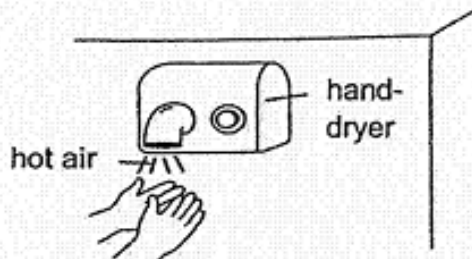
- (a) What physical property of air allowed her to do this? (1m)

- (b) Did the mass of the beach ball increase, decrease or remain the same after she pumped more air into it? Give a reason for your answer. (1m)

Wei Xuan observed that the beach ball became firmer after the ball was left under the hot sun for some time.

- (c) Explain why the beach ball became firmer after some time. (1m)

- 37 Andy wanted to dry his hands after washing them. He placed his hands under the hand-dryer to dry them.



- (a) Andy's hands were dry after a few minutes. Explain how his wet hands became dry after a while. (1m)

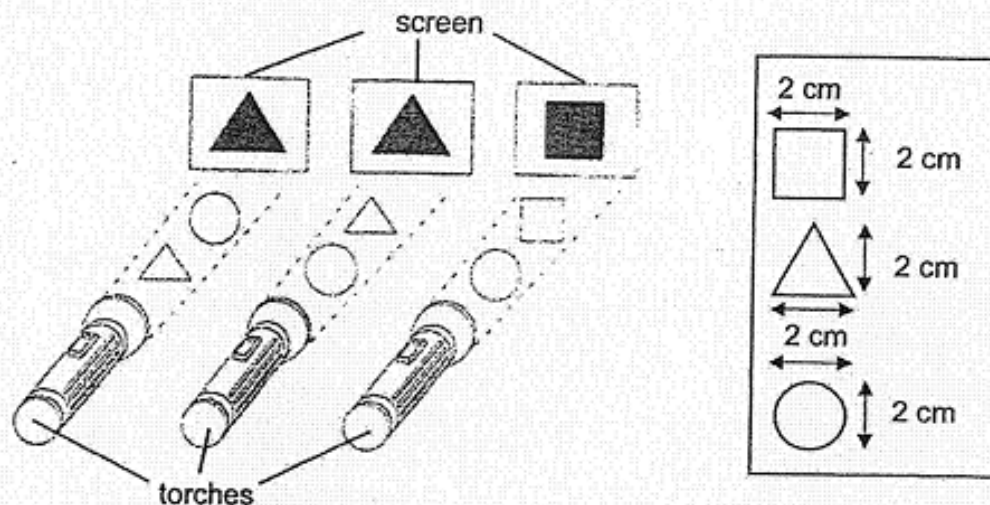
Andy wanted to find out if the temperature of air will affect the time taken to dry a pair of wet hands. He conducted an experiment and recorded the results in the table below.

Temperature of air from hand-dryer ($^{\circ}\text{C}$)	Time taken for hands to be completely dry (seconds)
30	60
35	45
40	30

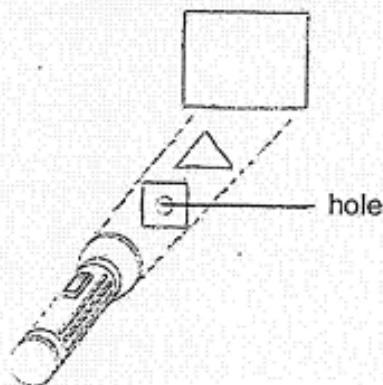
- (bi) Based on his results above, state how the temperature of air affects the time taken for the hands to dry completely. (1m)

- (bii) When Andy increased the wind speed of the hand-dryer, would the time taken for his hands to dry completely increase, decrease or remain the same? Explain your answer. (1m)

- 38 The diagram below shows the shapes of the shadows produced when two different objects were placed between a screen and a torch. The size of the objects is given in the box on the right.



A hole was made in the centre of the square object and it was then placed in front of the screen together with the triangular object, as shown below.



- (a) Tick (✓) the correct shadow which will be formed on the screen. (1m)



- (b) Explain your choice in (a). (2m)

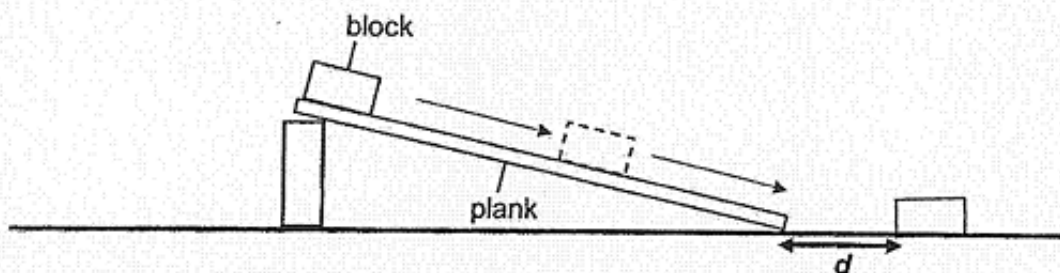
- 39 Bobby wanted to use a metal knife to cut a frozen ice cream cake but he found it difficult to do so. He then placed the knife in a glass of hot water as shown below.



- (a) Explain why Bobby found it easier to cut the ice cream cake by using the knife placed in hot water. (1m)

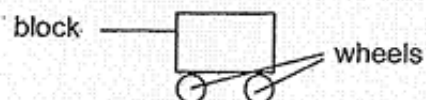
- (b) After some time, Bobby had to put the knife back into the hot water before cutting another piece of cake after some time. Explain why. (2m)

- 40 Jiamin released a block from the top of a plank. The block moved down the plank.



- (a) Name two forces acting on the moving block. (2m)

She repeated her investigation by adding two wheels below the block as shown below.



- (b) She noticed that the distance, d , moved by the block was longer. Why is that so? (1m)

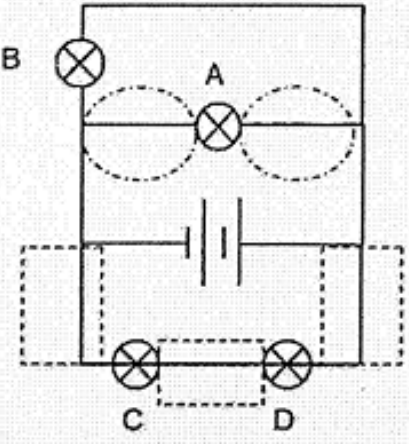
- (c) Other than adding the wheels to the block, suggest two other ways Jiamin can do to make the block travel a longer distance. (2m)

End of Booklet B
Please check your work.

ANSWER SHEET

1	(4)	6	(1)	11	(3)	16	(3)	21	(4)	26	(2)
2	(2)	7	(2)	12	(2)	17	(2)	22	(4)	27	(4)
3	(1)	8	(3)	13	(1)	18	(3)	23	(2)	28	(3)
4	(3)	9	(1)	14	(3)	19	(1)	24	(1)		
5	(2)	10	(2)	15	(2)	20	(4)	25	(3)		

29a	Insect. Grasshoppers have <u>3</u> <u>body parts</u> / have <u>3</u> <u>pairs of legs</u> .		
bi		Variable	Constant
	(i)	Presence of water	
	(ii)	Location of tanks placed	✓
	(iii)	Number of grasshoppers in each tank	✓
	(iv)	Number of day that the grasshoppers in the tanks	✓
bii	The survival of the grasshopper is due to one changed variable, <u>the presence of water</u> .		
30a	R. Cell R has a <u>cell wall</u> and <u>no chloroplast</u> . A root cell is a <u>plant cell</u> and <u>does not make its own food</u> .		
b	The organism has chloroplasts which contain <u>chlorophyll</u> to <u>trap light</u> which allows the organism to make its own food.		
31a	The heart pumps <u>faster</u> so that the blood can <u>transport more</u> <u>oxygen</u> to the <u>brain/head</u> .		
b	<u>Digested food/ carbon dioxide/ waste products</u>		
32a	G: <u>food/ sugar/ starch</u>		H: <u>water</u>
b	P is the <u>stem</u> and it contains <u>water-carrying tubes</u> and <u>Food -carrying tubes</u> . Water-carrying tubes transport <u>water from the roots to all parts of plant</u> while the food-carrying tubes transport <u>food from the leaves to all parts of plant</u> .		
33a	The bees helps to <u>transfer pollen grains</u> from the <u>anther</u> to the <u>stigma</u> of a flower.		
bi	As the temperature of the country <u>increases</u> , the number of bees <u>decreases</u> .		
bii	The population of plant N will decrease. From 2000 to 2020, the <u>temperature</u> of the country <u>increases</u> so there are <u>less adult bees to pollinate</u> the flowers. With less pollination, <u>less fertilisation / less flowers will develop into fruits</u> will take place. Thus, resulting in less seeds dispersed and <u>less seeds of plant N to germinate</u> .		
34a	(i) Egg	(ii) Larva	(iii)Pupa
	all Adult stage		
bi	The uncovered bamboo pole holders allow <u>water</u> to be collected after rain. Adult mosquitoes will then be able to <u>lay eggs</u> which will <u>hatch into larvae / young</u> .		
bii	The trap will cause the number of female mosquitoes to decrease in the country. Thus, there will be <u>less</u> <u>eggs laid</u> which will <u>develop into</u> <u>less</u> <u>young</u> .		

35a	<u>Parallel</u> arrangement
35b	If bulb B fuses, bulb A will still <u>light up</u> . <u>Electricity will be able to flow through bulb A in a closed circuit</u> because bulbs A and B are arranged in <u>parallel</u> .
35c	
36a	Air has <u>no definite volume</u> .
36b	The mass <u>increased</u> as air has <u>mass</u> .
36c	<u>Air in the beach ball gain heat from the sun and expanded</u> .
37a	<u>Water on Andy's hands gained heat from the hot air /hand-dryer and evaporated into water vapour</u> .
37bi	As the temperature of air <u>increases</u> , the time taken to dry the hands completely <u>decreases</u> .
37bii	The time taken will <u>decrease</u> . As the wind speed increases, the <u>rate of evaporation</u> of the water droplets <u>increase</u> .
38a	<input checked="" type="checkbox"/> (✓)
38b	Both the <u>triangle and square do not allow light to pass through</u> . The square is <u>closer</u> to the torch and <u>blocks more light</u> .
39a	The knife in cup Q <u>gains heat from the hot water which melts the frozen ice cream cake at a faster rate/shorter time</u> .
39b	The knife <u>lost heat to the ice cream/surroundings</u> after some time. He put the knife back to allow it to <u>gain heat from the hot water</u> .
40a	1. <u>Gravity/ Gravitational force</u> 2. <u>Friction/ Frictional force</u>
40b	The wheels <u>reduce the frictional force between the block and the plank</u> .
40c	<ul style="list-style-type: none"> • release the block with a greater push/force • add lubricant/water/oil

RED SWASTIKA SCHOOL REVISION PAPER

1. Study the two organisms, A and B below.



Organism A

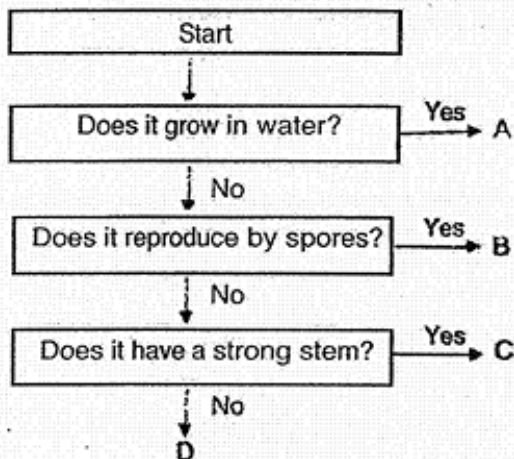


Organism B

Which set of information correctly describes organisms A and B?

	Organism A		Organism B	
	Covered with scales	Have fins	Covered with scales	Have fins
(1)	No	Yes	Yes	No
(2)	No	No	No	Yes
(3)	Yes	No	No	Yes
(4)	No	No	Yes	Yes

2. Study the flow chart and plant X shown below.



Plant X









Which of the following letters correctly represents plant X?

- (1) A
- (2) B
- (3) C
- (4) D

3. The table below shows the characteristics of two organisms, A and B. A tick (✓) indicates that the characteristic is observed and a cross (x) indicates that it is not observed.

Characteristics	Organism A	Organism B
able to make food	x	✓
has spores	✓	✓
has flowers	x	x

Based on the table above, which of the following organisms correctly represent A and B?

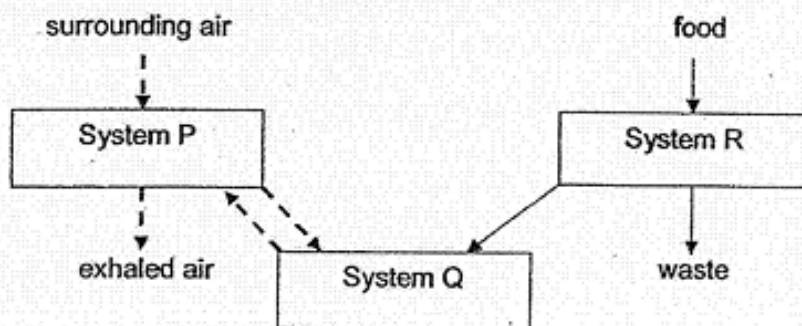
	Organism A	Organism B
(1)	 sunflower	 mushroom
(2)	 mushroom	 bird's nest fern
(3)	 bread mould	 sunflower
(4)	 bird's nest fern	 bread mould

4. Which of the following comparison(s) is/are false?

	Plant Transport System	Human Circulatory System
A	Has tubes that transport substances	Does not have tubes to transport substances
B	Transports food produced by the leaves only	Transports digested food only
C	There is no organ to pump the substances through the system	The heart pumps blood through the system

- (1) A only
 (2) A and B only
 (3) B and C only
 (4) A and C only

5. The diagram below shows how food and various gases are transported in the human body.



Which of the following best identifies P, Q and R?

	System P	System Q	System R
(1)	respiratory	circulatory	digestive
(2)	respiratory	digestive	circulatory
(3)	circulatory	digestive	respiratory
(4)	digestive	respiratory	circulatory

6. A group of children were trapped in a lift. After one hour, they felt very uncomfortable as the types of gases in the air in the lift changed.

Which of the following shows correctly the change in the amount of the types of gases in the air after being trapped in the lift for one hour?

(1)

Types of gases in the air	Change in the amount of gases after one hour
oxygen	decreased
carbon dioxide	decreased
water vapour	stayed the same

(2)

Types of gases in the air	Change in the amount of gases after one hour
oxygen	increased
carbon dioxide	increased
water vapour	increased

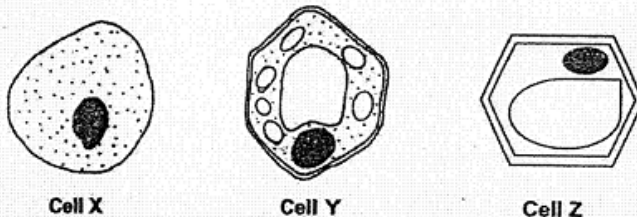
(3)

Types of gases in the air	Change in the amount of gases after one hour
oxygen	increased
carbon dioxide	decreased
water vapour	decreased

(4)

Types of gases in the air	Change in the amount of gases after one hour
oxygen	decreased
carbon dioxide	increased
water vapour	increased

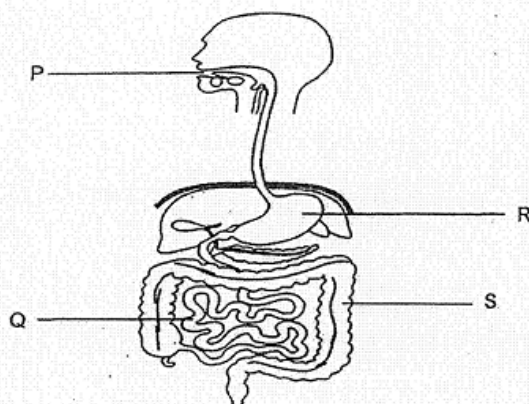
7. The diagrams below show three cells, X, Y and Z.



Which of the following statements is true about cells X, Y and Z?

- (1) They are animal cells.
- (2) They can make food.
- (3) They have cytoplasm and a cell wall.
- (4) They have a nucleus and a cell membrane.

8. The diagram below shows the human digestive system.



Three students each made a statement about the parts of the digestive system.

Ranesh: Digestion is completed here.

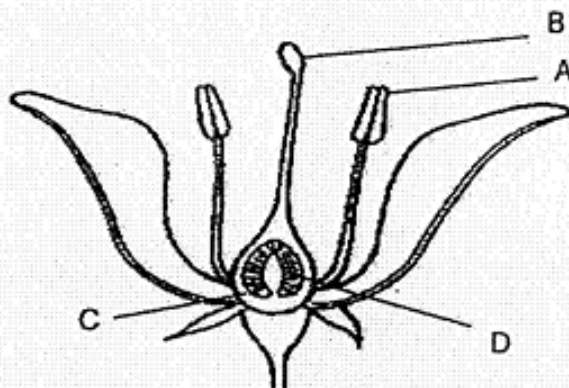
Lin Min: Digestive juices are added here.

Vivian: Water is absorbed from the undigested food here.

Which of the part(s) P, Q, R and S, match correctly to the statements made by the three students?

	Ranesh	Lin Min	Vivian
(1)	Q	P, Q	R
(2)	Q	P, R, Q	S
(3)	S	P, R, Q	S
(4)	S	R, Q	P

9. Study the flower shown.



Part(s) of the flower is/are removed. After some time, the flower developed into a fruit. Which part(s) was/were removed?

- (1) A only
- (2) B only
- (3) A and B only
- (4) C and D only

10. For an adult plant to produce seeds, which process(es) must take place?

- (1) germination
- (2) fertilisation
- (3) pollination and fertilisation
- (4) germination and pollination

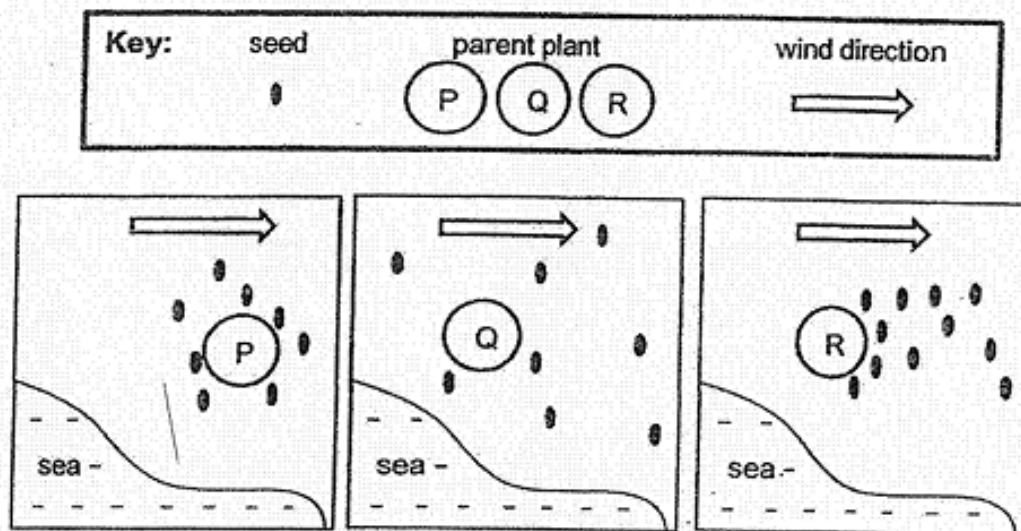
11. A student made three statements about sexual reproduction in plants and humans.

- A Fertilisation occurs in a female reproductive part.
- B Reproductive cells are produced in the testes.
- C The fertilised egg is found in the ovary.

Which of the following shows the statements correctly matched to plants and humans?

	Plants	Humans
(1)	A, C	B
(2)	B, C	A, C
(3)	A, C	A, B
(4)	A	A, B, C

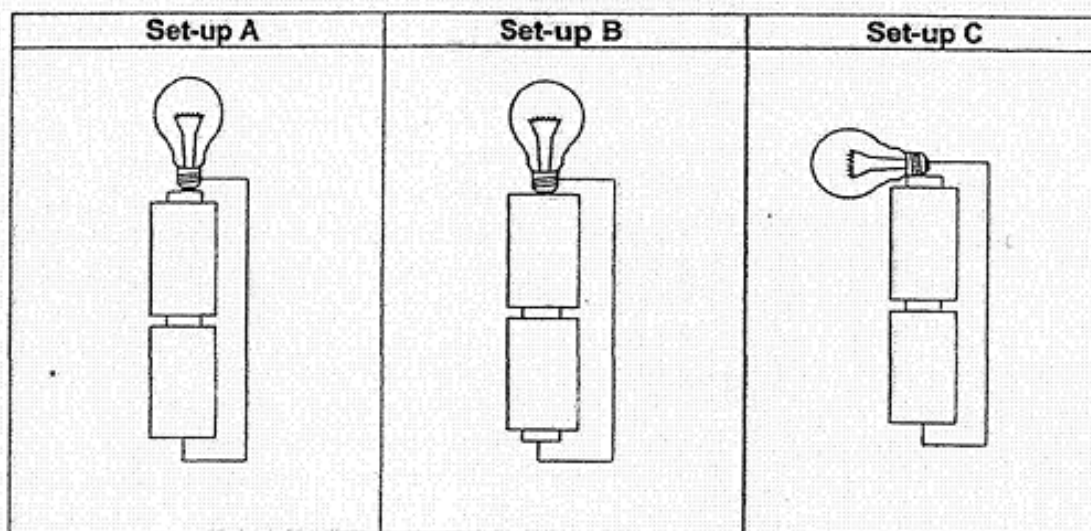
12. Study the dispersal of seeds by plants P, Q and R.



Which of the following correctly represents the seed dispersal method for plants P, Q and R respectively?

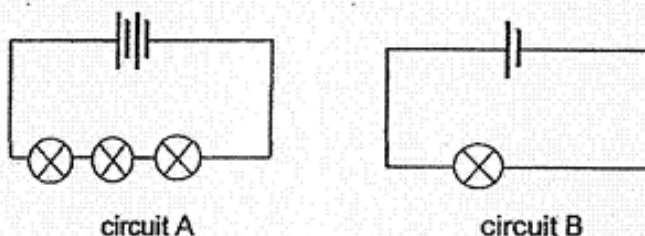
	Plant P	Plant Q	Plant R
(1)	animal	splitting	wind
(2)	splitting	animal	wind
(3)	animal	wind	splitting
(4)	wind	animal	splitting

13. Jia En set up three arrangements of identical batteries, wires and bulbs as shown in the diagram below.



Which of the following statements is correct?

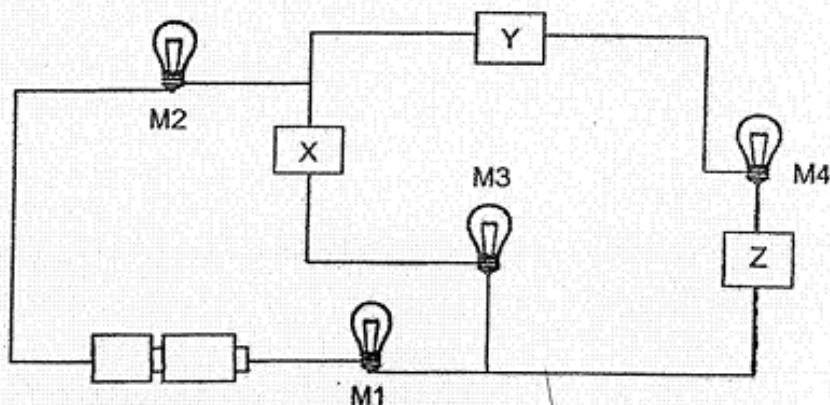
- (1) None of the bulbs will light up.
 - (2) Only the bulb in set-up A will light up.
 - (3) The bulb in set-up A will be brighter than the bulb in set-up B.
 - (4) The bulbs in all three set-ups have the same brightness.
14. Billy set up two circuits, A and B, as shown in the diagram. He wants to find out if the number of batteries in a circuit affects the brightness of the bulbs. However, his brother says that his experiment is not a fair one.



Which of the following must Billy do to achieve his aim?

- (1) Remove one battery from circuit A.
- (2) Remove one bulb from circuit A.
- (3) Add two bulbs in parallel arrangement to circuit B.
- (4) Add two bulbs in series arrangement to circuit B.

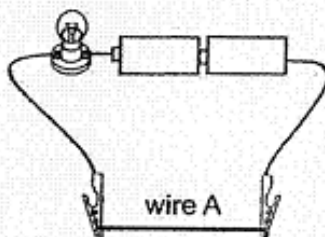
15. Siti connected three objects, X, Y and Z, to an electrical circuit as shown below. All the bulbs were in working condition.



Which of the following is a possible observation?

	Electrical conductors	Bulb(s) that lit up
(1)	X and Z only	M1, M2 and M3 only
(2)	X, Y and Z	M1, M2 and M3 only
(3)	Y and Z only	M2 and M4 only
(4)	X, Y and Z	M3 and M4 only

16. Zhi Ming wanted to find out how the brightness of the bulb is affected by the length of wire A used in the circuit. He used the electric circuit shown in the diagram below to carry out his experiment.

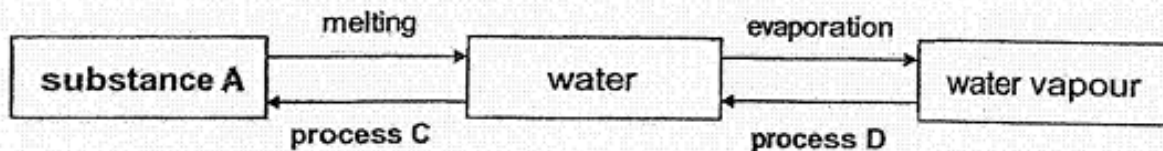


Which of the following variables should be kept constant to ensure a fair test?

- A: Length of wire A
 B: Number of batteries used
 C: Brightness of the bulb

- (1) A only
 (2) B only
 (3) B and C only
 (4) A and C only

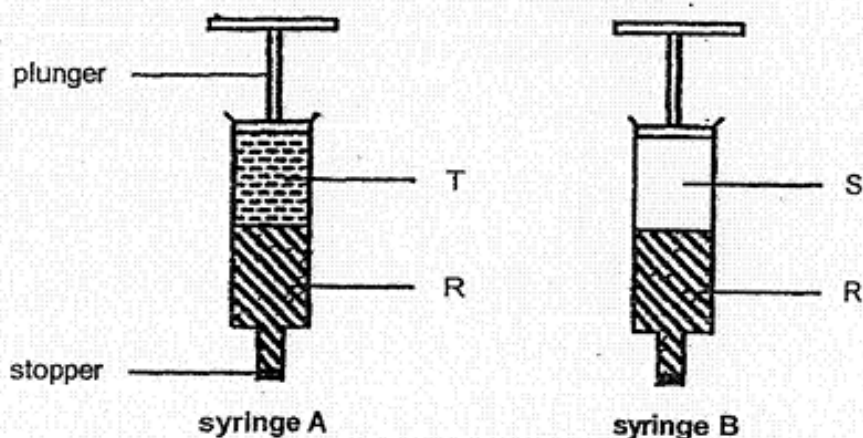
17. The diagram below shows the changes in the states of water.



Which of the following correctly represents substance A and processes C and D?

	substance A	process C	process D
(1)	ice	evaporation	melting
(2)	ice	freezing	condensation
(3)	steam	boiling	condensation
(4)	steam	freezing	melting

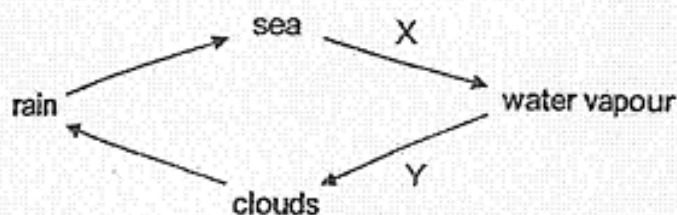
18. Two syringes containing different substances are shown below.



Which of the following best explains why only the plunger for syringe B could be pushed down but not the plunger for syringe A?

- (1) Substance S has no definite volume.
- (2) Substance S cannot be compressed.
- (3) Substance R has no definite volume.
- (4) Substance T can be compressed.

19. The diagram below shows the water cycle. X and Y represent two different processes.



Which of the following statements is correct?

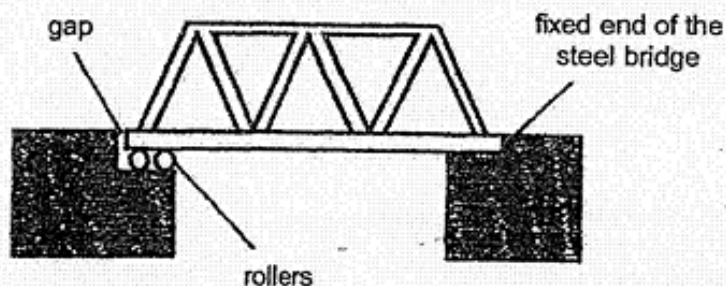
- (1) Water loses heat during process X.
 - (2) Water gains heat during process Y.
 - (3) Process X takes place at a fixed temperature.
 - (4) There is no change in state of matter when rain falls from the clouds.
20. The table below shows the freezing points and boiling points of 4 different substances W, X, Y and Z.

Substance	Freezing Point (°C)	Boiling Point (°C)
W	43	200
X	15	55
Y	90	100
Z	5	25

Which two of the substances are in the solid state at 30°C?

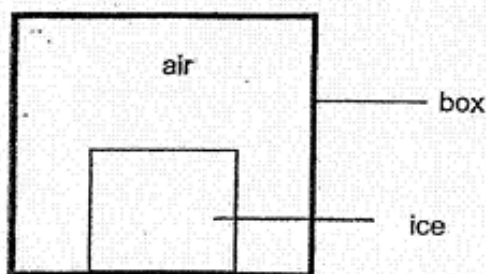
- (1) W and X
- (2) W and Y
- (3) X and Y
- (4) X and Z

21. The diagram below shows a steel bridge with one end of the bridge fixed while a gap is left at the other end supported by rollers.



Why is there a gap at one end of the steel bridge?

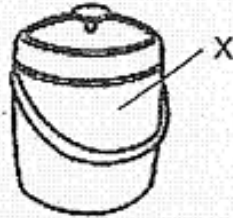
- (1) To allow the steel bridge to decrease in volume due to expansion on a cold day.
 - (2) To allow the bridge to increase in mass due to expansion on a hot day.
 - (3) To allow the bridge to increase in volume due to expansion on a hot day.
 - (4) To allow the bridge to decrease in mass due to contraction on a cold day.
22. A block of ice is placed in a closed box as shown in the diagram below.



What will happen to the temperature of the ice and the air in the box during the process of melting?

	Temperature of ice	Temperature of air in the box
(1)	remains the same	decreases
(2)	increases	decreases
(3)	increases	remains the same
(4)	decreases	remains the same

23. The diagram below shows a container that can be used to keep ice cubes during a picnic. The ice cubes melt slowly when they are kept in the container.



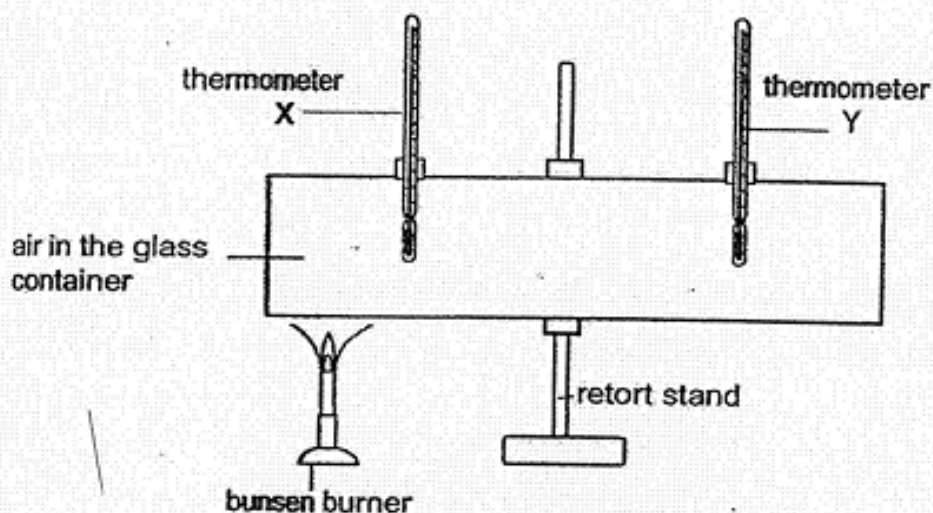
Study the properties of the four materials shown below.

Material	Property of material	
	Can bend easily	Can conduct heat easily
A	yes	yes
B	yes	no
C	no	no
D	no	yes

Which material is the most suitable for making part X of the container?

- (1) A
- (2) B
- (3) C
- (4) D

24. Hassan set up an experiment as shown below.



He recorded the temperature on the two thermometers at regular intervals in the table shown below.

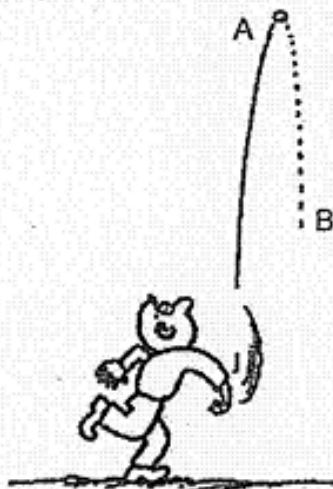
Time (min)	Temperature on thermometers (°C)	
	X	Y
0	28	28
2	30	29
4	33	31
6	38	34

Which of the following can he conclude based on the results of the experiment?

- A: Air is a conductor of heat.
- B: Air gains heat and expands.
- C: Heat travels from a hotter region to a colder region.

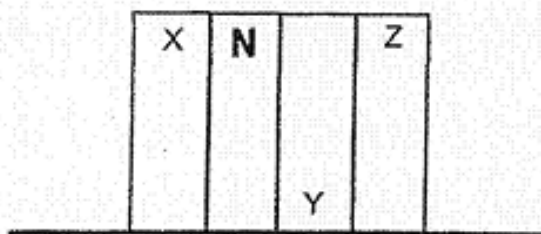
- (1) A only
- (2) B and C only
- (3) A and C only
- (4) A and B only

25. Jordan threw the ball upwards as shown in the diagram below.



Which of the following is correct?

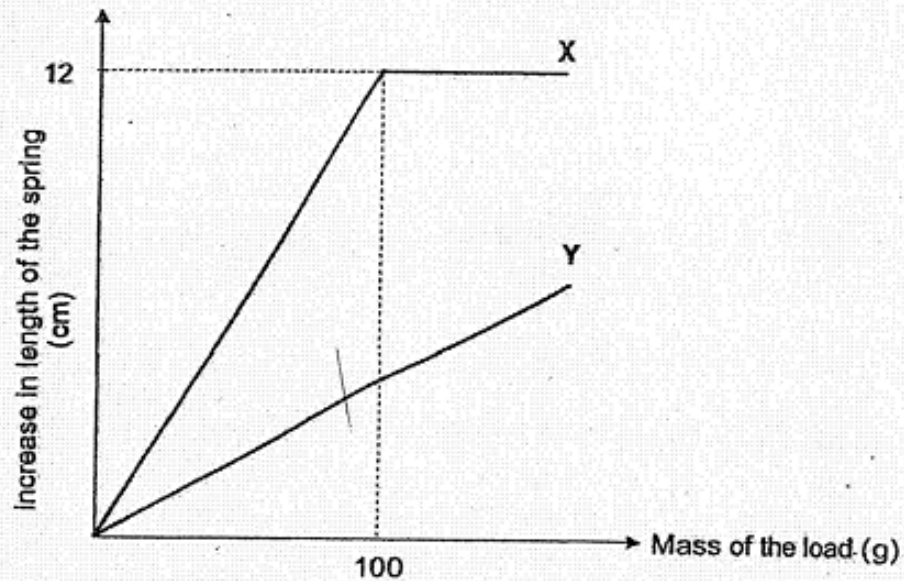
- (1) The gravitational force acting on the ball at point A is more than that at point B.
 - (2) The gravitational force acting on the ball at points A and B are the same.
 - (3) The ball has more gravitational force acting on it at a height higher than point A.
 - (4) The ball has no gravitational force acting on it at point B.
26. Russell brought four magnets near each other and observed that they are attracted to each other as shown in the diagram.



Which of the following correctly identifies poles X, Y and Z?

	X	Y	Z
(1)	South	North	North
(2)	South	North	South
(3)	North	South	North
(4)	North	North	South

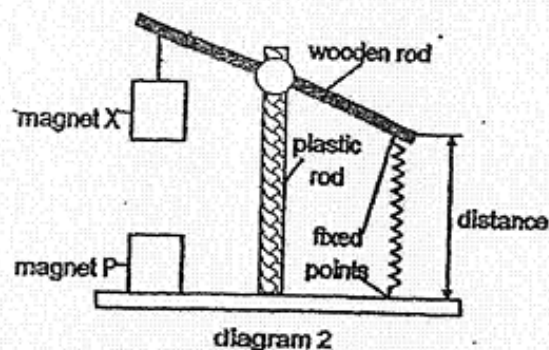
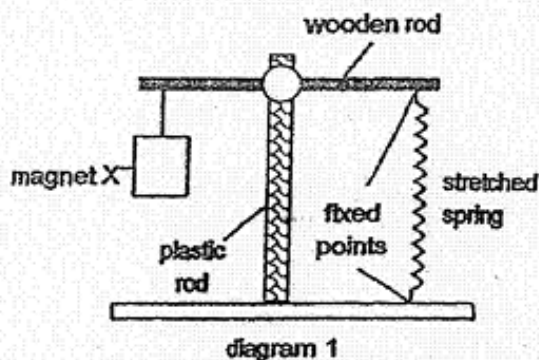
27. Hannah hung different loads on two springs, X and Y. She observed and recorded the extension of each spring when different loads were hung on it.



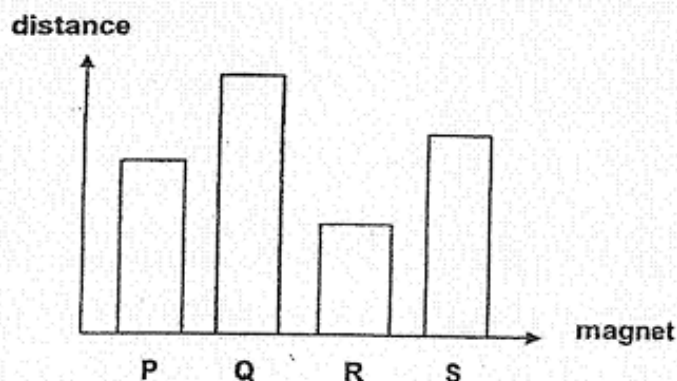
Based on the graph, which of the following is correct?

- (1) Spring Y is less stiff than spring X.
- (2) Spring X and Y have the same stiffness.
- (3) When a load of 100g was added, the length of spring X is 12 cm.
- (4) When a load of less than 100g was added, spring Y extends less than spring X.

28. Melissa set up the experiment as shown below. All magnets used are identical in shape and size. When magnet P was placed directly below magnet X, the wooden rod tilted as shown in diagram 2. She recorded the distance as indicated in diagram 2.



The experiment was repeated by replacing magnet P with magnets Q, R and S. The magnets are placed with the like poles facing each other. When different magnets were used, the distance measured when the wooden rod tilted were shown in the graph below.



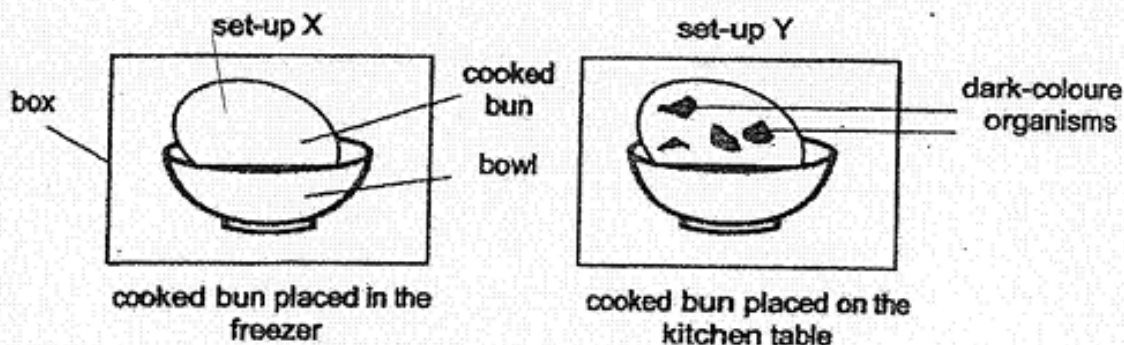
Based only on the results above, which of the following correctly shows the arrangement of the magnets?

	Greatest magnetic strength → Least magnetic strength			
(1)	Q	P	S	R
(2)	Q	S	P	R
(3)	R	P	S	Q
(4)	R	S	P	Q

END OF BOOKLET A

Answer all the questions in the spaces provided.

29. Saminah conducted an experiment as shown in the diagram below. After one week, she noticed some dark-coloured organisms growing on the cooked bun in set-up Y only.



- (a) Explain why there was no dark-coloured organisms growing on the cooked bun in set-up X. (1m)

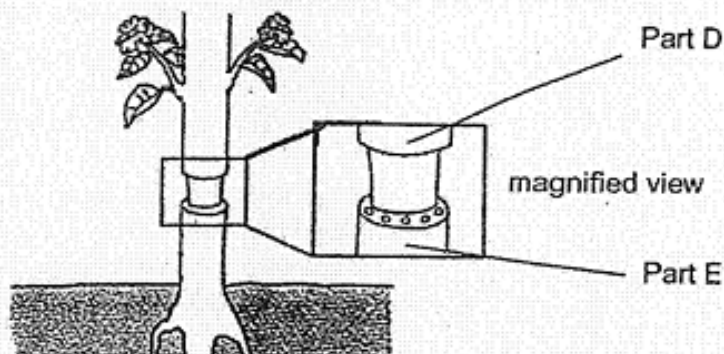
- (b) How do the dark-coloured organisms on the cooked bun reproduce? (1m)

29. Saminah repeated the experiment by putting substance T in the set-up. After one week, she observed that there was less dark-coloured organisms growing on the cooked bun compared to set-up Y as shown in the diagram below.



- (c) Based on the observation, what could substance T have removed from the air in the box? (1m)

30. Kai Xin removed some food-carrying tubes of the stem from a plant as shown below.



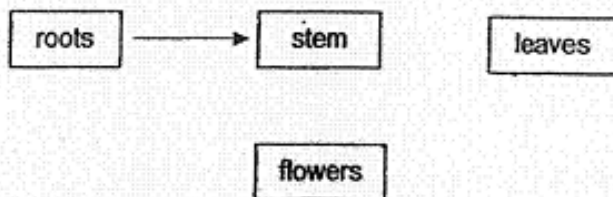
After some time, she measured the thickness of the stems and recorded it in the table below.

- (a) Based on the data in the table, write "D" or "E" in the blanks to show the correct part she had observed. (1m)

Part	Day 1	Day 4	Day 7
(i)	16 cm	18 cm	20 cm
(ii)	16 cm	16 cm	16 cm

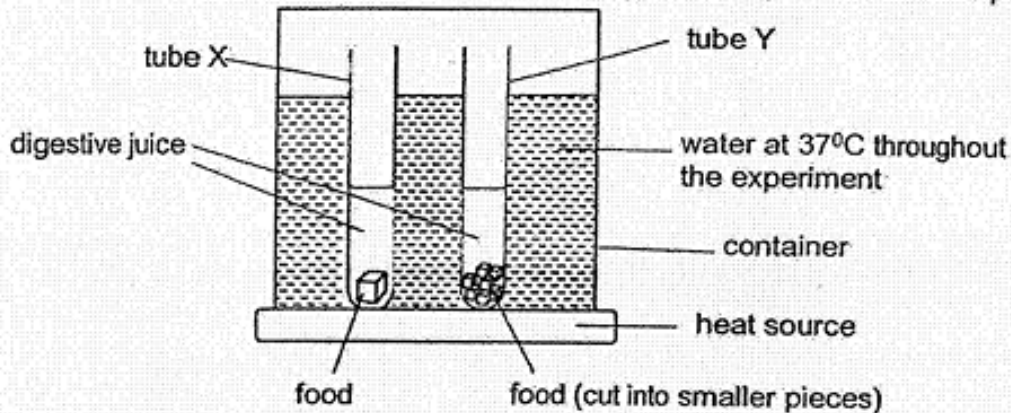
- (b) Explain your answer in (a)(i). (2m)

Kai Xin wrote down four parts of a plant as shown below.



- (c) Draw 2 more arrows (—————>) to show how water is transported in a plant. (1m)

31. Henry wanted to investigate the process of digestion in the human body. The diagram shows two tubes, X and Y, with the same type of food, at the start of experiment.



- (a) Give a reason why Henry chose a temperature of 37°C for the water in the container. (1m)

He recorded the data as shown in the table below.

Tube	Amount of digestive juice used (cm ³)	Mass of the food (g)	Total surface area of the food (cm ²)	Time taken for the food to be digested completely (min)
X	80	20	10	170
Y	80	20	30	140

- (b) Based on the table, how does surface area of the food affect the time taken to digest the food completely? (1m)
- (c) Henry wants to reduce the time taken to digest the same amount of food completely. Suggest how he can change one variable in the table to achieve his aim. (1m)

32. Julia wanted to find out more about the human circulatory system. The table below shows records of her heart rates while she was performing different activities in a day.

Activities	Resting	Walking	Running	Sleeping
beats/min	60	70	100	60
	62	75	105	65
	65	72	102	0

- (a) Julia realised that she had recorded one of her heart rates wrongly. Circle the wrong reading on the table above. (1m)
- (b) Explain your answer in (a). (1m)
-
-
- (c) Julia observed that her breathing rate increases when she was running. Explain why her breathing rate increases. (1m)
-
-

33. Mrs Tan filled two similar pots, A and B, with an equal amount of soil. She put the same type of seeds into the pots and placed them next to a window where there is plenty of sunlight and air. Mrs Tan watered the pots with an equal amount of water every day.



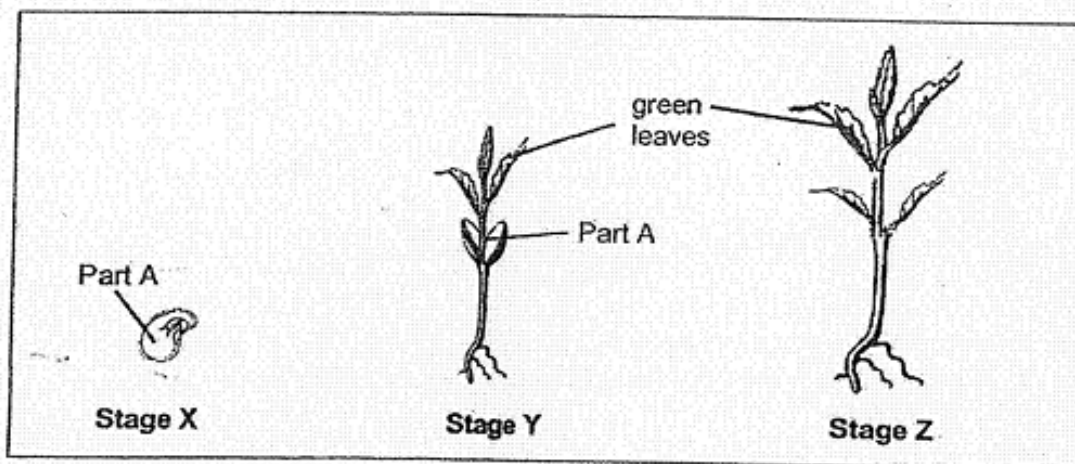
30 seeds in Pot A



5 seeds in Pot B

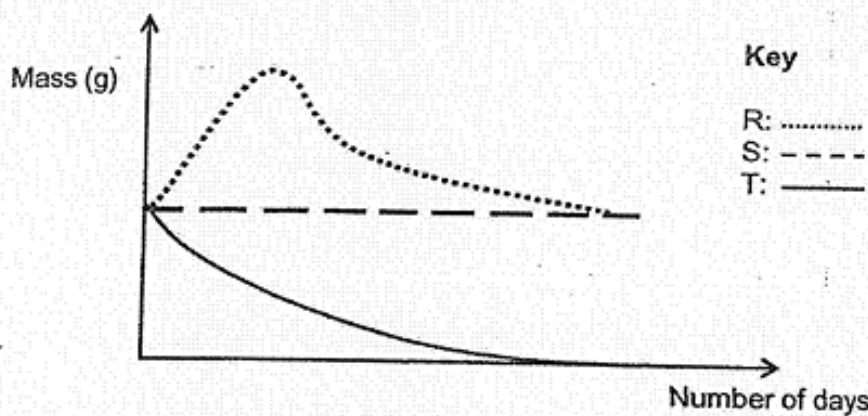
- (a) Which pot, A or B, will contain taller plants after two weeks? (1m)
-
- (b) Explain your answer in (a). (1m)
-
-

33. After one month, the seeds grew into young plants. Mrs Tan studied the growth of one plant closely at different stages, X, Y and Z as shown below.



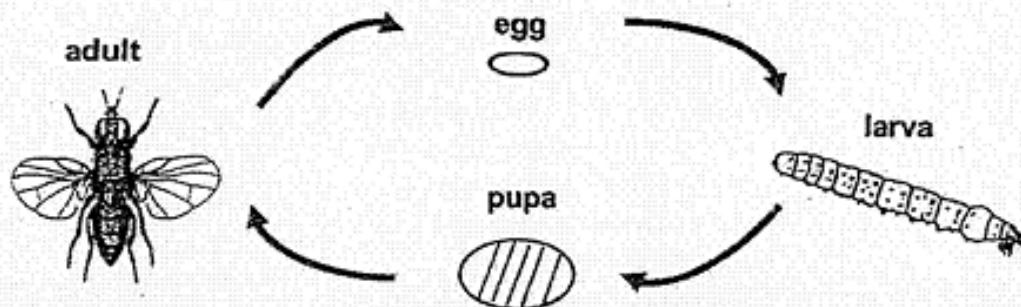
- (c) How does the plant in stage Y obtain food? (1m)

The graph below displays the mass of part A of the plant.



- (d) Based on the above graph, which line, R, S, or T, best represents the mass of part A of the plant from stage X to stage Z? Explain your answer. (2m)

34. Charmaine studied the life cycle of organism G as shown below.



- (a) Charmaine classified organism G as an insect. Based on the diagram of the adult, state two characteristics of the adult that helped her to classify it as an insect. (2m)

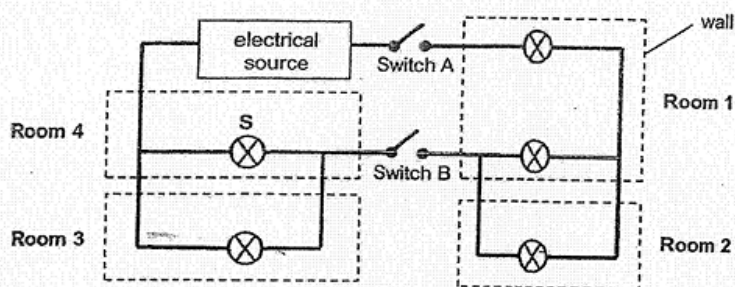
She studied how the temperature of the surrounding affected the life cycle of organism G. Her findings were recorded in the table below.

Temperature (°C)	Number of days for one complete life cycle
15	58
20	47
25	34
30	Q
35	16

- (b) Based on the information in the table, what could be a possible value of Q? (1m)

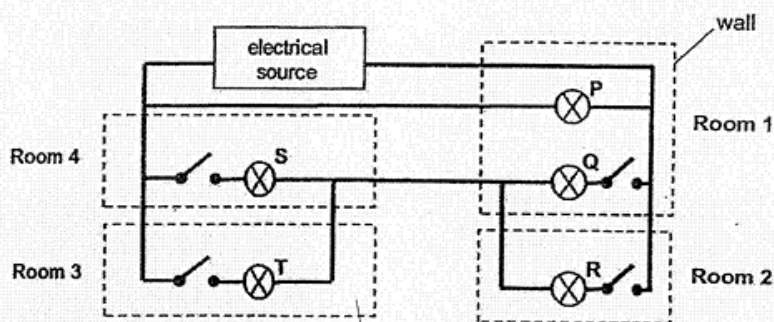
- (c) From Charmaine's findings, what is the relationship between temperature and the duration of one complete life cycle? (1m)

35. Shantel has a toy house with four rooms. She connected the light bulbs in the rooms using the circuit diagram shown below.



- (a) How many bulbs will light up if only switch A is closed? (1m)
- _____
- (b) Shantel closed switch A and switch B. If bulb S fuses, how many of the remaining bulbs will light up? (1m)
- _____

Shantel made some changes and the new circuit diagram design is shown below.

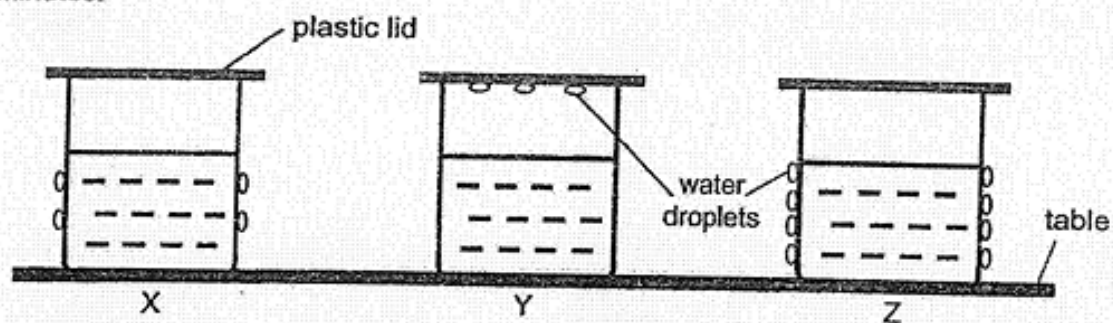


This new design allowed Shantel to make one of the bulbs a "safety" light which cannot be switched off.

- (c) Which bulb, P, Q, R, S or T, is the "safety" light? (1m)
- _____
- (d) Shantel closed three of the switches. Bulb S was one of the bulbs that lighted up. Below are some possible observations, put a tick (✓) in the correct boxes. (2m)

Observations	True	False	Not possible to tell
(i) Bulb T did not light up			
(ii) Bulb Q lighted up			

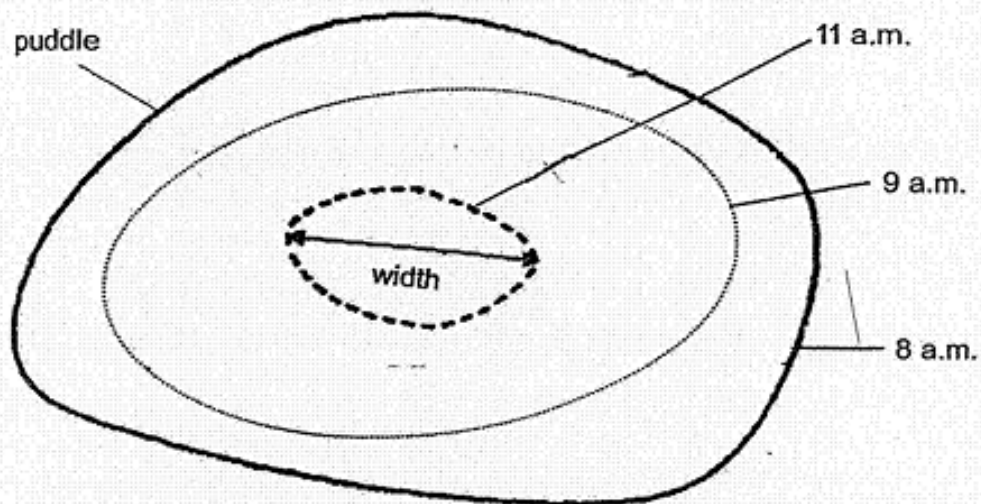
36. Three identical containers, X, Y and Z, containing the same amount of water at different temperatures were placed on a table. Sarah made the following observation after five minutes.



- (a) Arrange the containers, X, Y and Z, based on the temperature of the water in them, from the lowest temperature to the highest temperature. (1m)

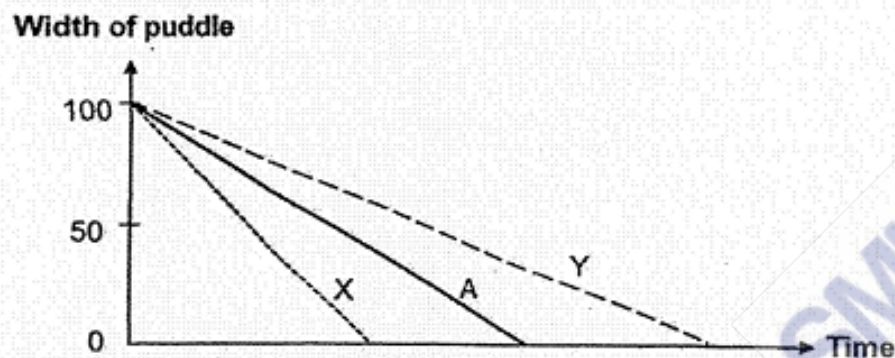
- (b) Describe how the water droplets formed on the outer surface of beaker Z. (2m)

37. After a heavy rainfall, Hassim noticed that a puddle of water formed on the ground. As time passed, the puddle gradually became smaller. He measured the width of the puddle at different timings of the day and recorded them in his notebook. The width of the puddle at 11 a.m. is shown in the diagram.



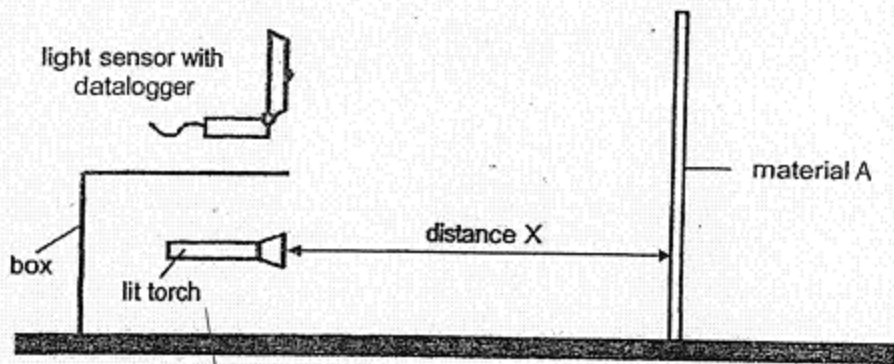
- (a) Draw a ring in the diagram above to show the size of the puddle at 10 a.m.. (1m)
- (b) If no water was absorbed into the ground, explain why the puddle of water became smaller over time. (1m)

Study the graph below. Line A shows how the puddle of water of width 100 cm changed over time.



- (c) Which line, X or Y, shows how the puddle of water of width 100 cm will change on a hotter day? (1m)

38. Harold conducted an experiment in a dark room using the set-up below. He wanted to find out how much light is reflected by material A.

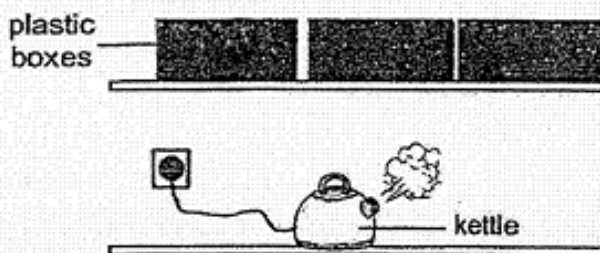


- (a) For the experiment to work, give an example of the material for the box. (1m)
- _____
- (b) For the experiment to work, what property must the material in part (a) have? (1m)
- _____
- (c) Harold wanted to record the result as shown in the table. However, he mixed up the values for the amount of light measured by the datalogger.

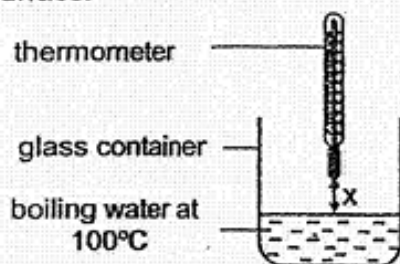
Using the values of 100, 150 and 200, write down the correct answers in the boxes in the table below. (1m)

Distance X (cm)	10	20	30
Amount of light measured by datalogger (unit)	(i)	(ii)	(iii)

39. Victoria wants to build a shelf above her kettle to store plastic boxes. She does not want the plastic boxes to be affected by the heat given off by the kettle.



She conducted the following experiment to find out a suitable height to build the shelf. She filled a glass container with boiling water at 100°C and kept the water boiling throughout the experiment. She measured the temperature of air at various distance, X, from the water surface.



The result is recorded in the table below.

Distance X (cm)	15	20	25	30	35
Temperature of air ($^{\circ}\text{C}$)	58	40	30	30	30

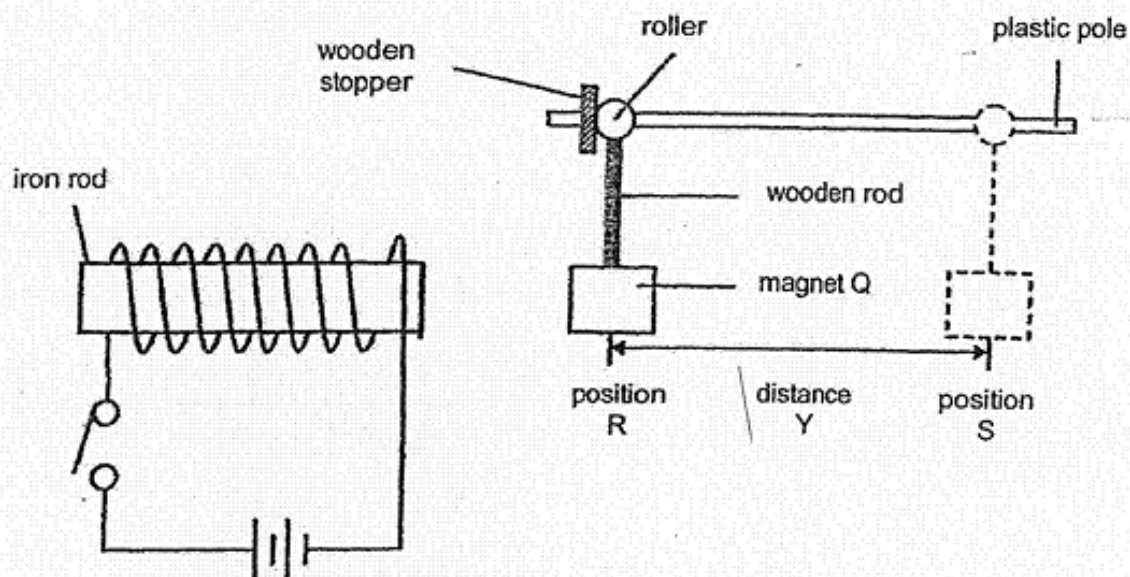
- (a) Victoria wants the plastic boxes to be least affected by the heat from the kettle. Based on the results of the experiment, what is the lowest height from the kettle to build the shelf? Explain why. (2m)

Lowest height: _____ cm

Explanation: _____

- (b) Explain how using a glass container allowed Victoria to obtain a more accurate result. (1m)

40. Study the diagram below. When the switch in the circuit was closed, magnet Q moved from position R to position S as indicated by distance Y.



- (a) Describe how closing the switch caused magnet Q to move. (2m)
- _____
- _____
- _____
- (b) Without removing or replacing any items in the set-up above, suggest two changes that can be made to the above set-up such that "distance Y" can be increased. (2m)
- Change 1: _____
- _____
- Change 2: _____
- _____
- (c) Magnet Q is replaced by block P. When the switch was closed, block P did not move. Give an example of a material that is used to make block P. (1m)
- _____

END OF BOOKLET B
PLEASE CHECK YOUR ANSWERS.

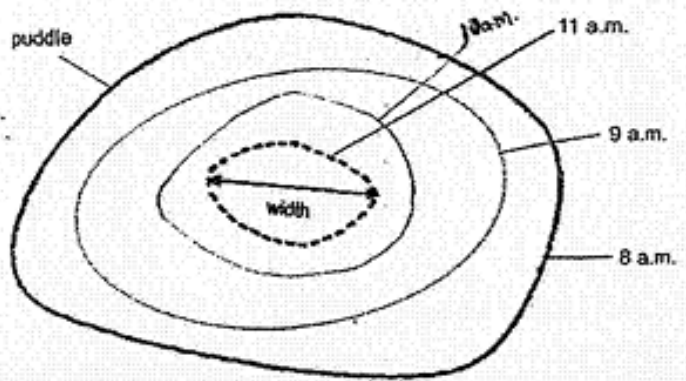
ANSWER SHEET

PAPER 1

Q1	4	Q2	3	Q3	2	Q4	2	Q5	1
Q6	4	Q7	4	Q8	2	Q9	1	Q10	3
Q11	4	Q12	2	Q13	4	Q14	4	Q15	1
Q16	2	Q17	2	Q18	1	Q19	4	Q20	2
Q21	3	Q22	2	Q23	3	Q24	3	Q25	2
Q26	1	Q27	4	Q28	3				

PAPER 2

Q29	(a)	The bun in Set-up X was placed in the freezer which kept the bun cold, not allowing mould, known as dark-coloured organism to grow due to a missing factor, warmth.	
	(b)	The dark-coloured organisms on the cooked buns feed on the bread to grow and reproduce by spores.	
	(c)	Water vapour	
Q30	(a)	(i)	D
		(ii)	E
	(b)	Food made by the leaves could not be passed transported the plant through the food-carrying tubes and was collected and unable to travel so it swelled up and became thicker at D.	
	(c)	Stem → leaves ↓ Flowers	
Q31	(a)	37°C is the temperature of our body so he used 37°C for the water in order to create what would happen if it was in our body.	
	(b)	The more surface area exposed, the less time taken it	

Q37	(a)		
	(b)	The water droplet gained heat from the sun and the surrounding air and evaporated into water vapour	
	(c)	X.	
Q38	(a)	Metal	
	(b)	Must not allow light to pass through	
	(c)	(i)	200
		(ii)	150
		(iii)	100
Q39	(a)	25cm Explanation: 25cm, 30cm, 35cm all had same amount of heat transferred to the plastic boxes. Thus, all the temperature is constant.	
	(b)	Plastic would melt at 100°C	
Q40	(a)	When the switch is closed, the iron rod becomes a electromagnet and repels magnet Q. As the magnetic force is strong, Q is repelled and moved backwards.	
	(b)	Change 1	Add more batteries to the iron rod set-up.
		Change 2	Add more coils around the iron rod.
	(c)	Plastic	

31)C) To increase the amount of digestive juice used.

32)a) Sleeping → 0

b) When you are sleeping, the heart rate cannot be zero.

c) When she was running, more oxygen is needed, so the breathing rate increases so that more oxygen can enter the blood and supply to other parts of the body.

33)a) Pot A

b) The seeds need sunlight to survive. As it is very crowded, the plants will grow taller to obtain more sunlight.

c) From Part A at first and once the green leaves appear, the plant will make its own food.

d) T as it contains the most food for the plant and will be depleted after some days.

34)a) It has 3 body parts and 3 pairs of legs.

b) 24

c) The higher the temperature, the shorter the duration of one complete life cycle.

35)a) 0

b) 4

c) Bulb P

d) i) Not possible to tell. ii) Not possible to tell.

36)a) Z, X, Y

b) When the colder surface of the container touches the hotter surface, the air in the surrounding loses heat and condenses and water droplets are formed.

ROSYTH SCHOOL EOY PAPER

For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet. (56 Marks)

1 Which of the following are made of cells?

- A: cat
- B: moon
- C: teddy bear
- D: tomato plant

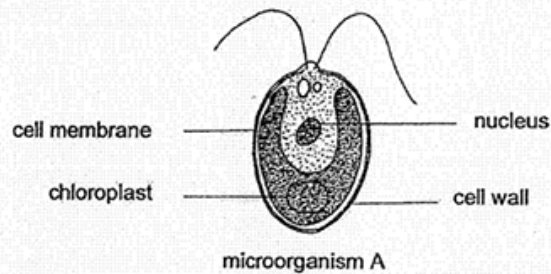
- (1) A and B only
- (2) A and D only
- (3) B and C only
- (4) C and D only

2 A certain substance found in the cells of a firefly responsible for glowing is transferred into some mice. It was observed the young of those mice can glow in darkness.

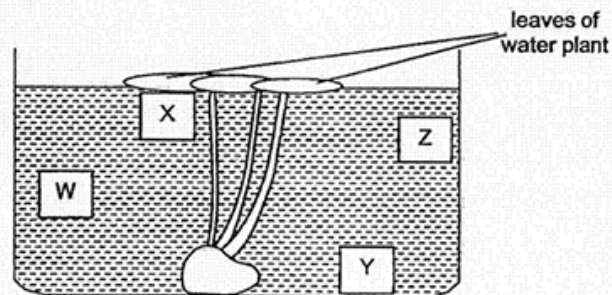
In which part of the cell the substance responsible for glowing was transferred into the mice?

- (1) nucleus
- (2) cytoplasm
- (3) chloroplast
- (4) cell membrane

- 3 Daniel introduced a population of microorganism A into a pond. Microorganism A can move in the water.



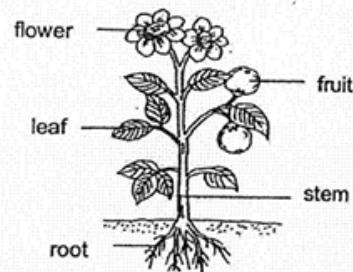
The pond was situated in a bright place. W, X, Y and Z, represent different parts in the pond.



Based on the information given, in which part of the pond would the microorganism A make the most food?

- (1) W
- (2) X
- (3) Y
- (4) Z

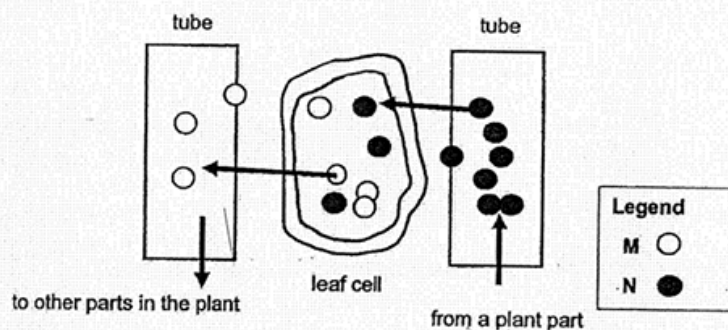
- 4 The diagram below shows a plant.



Which parts of the plant will food made in the leaves be transported to?

- (1) stem and roots only
- (2) stem and flower only
- (3) stem, flower and fruit only
- (4) stem, flower, fruit and root

- 5 The diagram below shows the side view of a leaf cell and two different types of tubes found in the stem. M and N are substances that are transported along the tubes into and out of the leaf cell in the day as shown below.

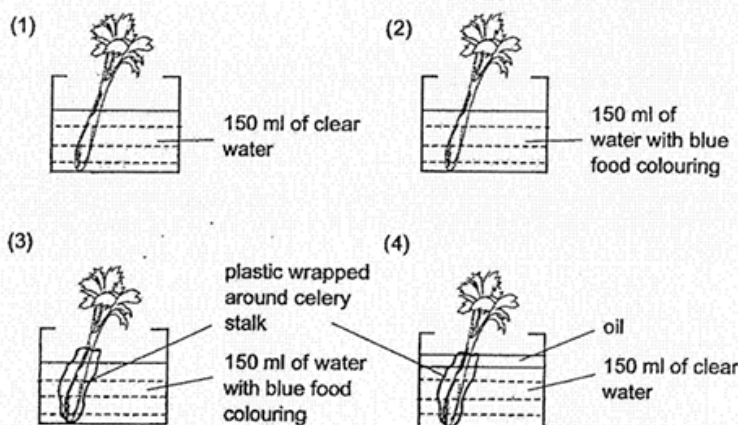


What could substances M and N be?

	M	N
(1)	sugar	carbon dioxide
(2)	starch	water
(3)	oxygen	carbon dioxide
(4)	sugar	water

- 6 Susan wants to show that celery has water-carrying tubes to transport water to the leaves.

Which one of the following should she use as an experimental set-up?

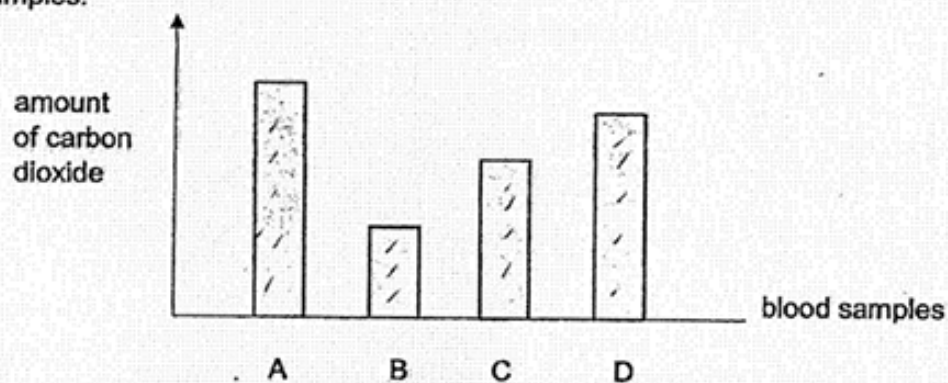


- 7 Which of the following statements about the different human systems is not correct?
- (1) Respiratory system carries out gaseous exchange.
 - (2) Respiratory system is made up of nose, windpipe and lungs.
 - (3) Circulatory system transports substances such as water, digested food and oxygen to all parts of the body.
 - (4) Digestive system breaks down food into simple substances in the mouth, stomach, small intestine and large intestine.

8 Read the following statements about inhaled air and exhaled air in a human. Which one of the statements is correct?

- (1) Exhaled air contains no oxygen.
- (2) Exhaled air contains only carbon dioxide.
- (3) Inhaled air contains more oxygen than nitrogen.
- (4) Inhaled air contains more oxygen than exhaled air.

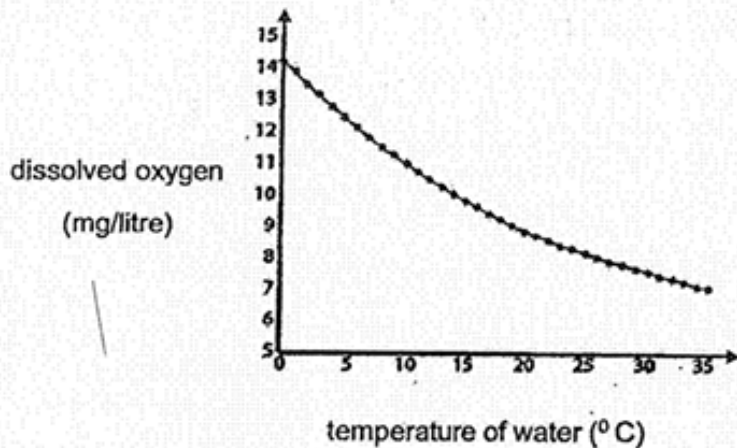
9 Four blood samples were collected from different blood vessels in the body. The following graph shows the amount of carbon dioxide in each of the blood samples.



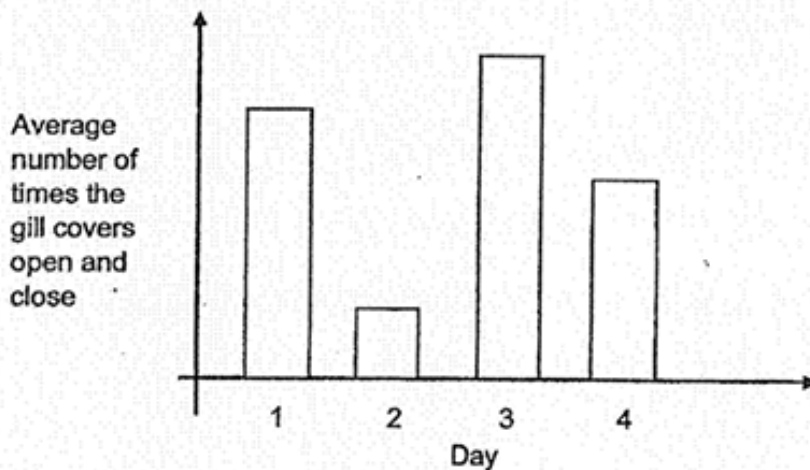
Which one of the blood samples is most likely taken from the blood vessel carrying blood from the heart to the lungs?

- (1) A
- (2) B
- (3) C
- (4) D

- 10 Ally studied the graph that shows the relationship between the temperature of water and the amount of dissolved oxygen in water.



Ally observed another graph below which shows the average number of times the gill covers of a guppy open and close on four different days to obtain enough oxygen.



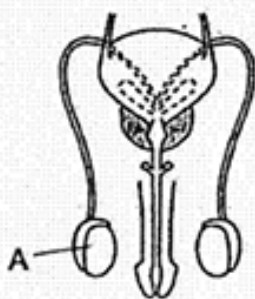
Based on the two graphs, on which day was the temperature of water the highest?

- (1) Day 1
- (2) Day 2
- (3) Day 3
- (4) Day 4

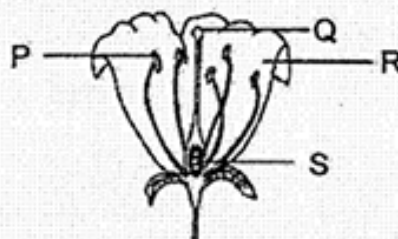
11 Which of the following statements about reproduction in human is not correct?

- (1) An egg is fertilised by one sperm.
- (2) Fertilised egg travels to the womb.
- (3) Eggs are produced and stored in the ovaries.
- (4) Pollination must take place before fertilisation.

12 The diagram below shows a human and plant reproductive systems.



human reproductive system

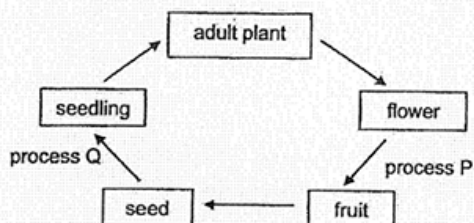


plant reproductive system

Which part, P, Q, R or S, has the same function as part A?

- (1) P
- (2) Q
- (3) R
- (4) S

- 13 The diagram below shows developmental stages of a flowering plant.



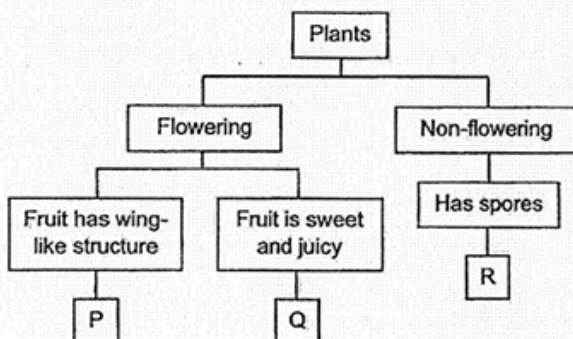
Which of the following shows the processes, P and Q, that would occur just before the next developmental stage is formed?

	Process P	Process Q
(1)	pollination	germination
(2)	fertilisation	dispersal
(3)	pollination	dispersal
(4)	fertilisation	germination

14. The table below shows the characteristics of two plants, X and Y.

Plant	Characteristics	
	reproduce by seeds	dispersed by wind
X	✓	✓
Y	x	✓

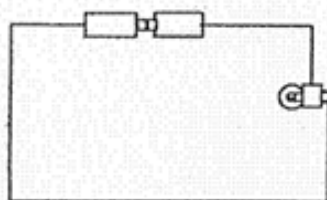
From the information given above, identify the groups that plants X and Y belong to as shown in the classification chart below.



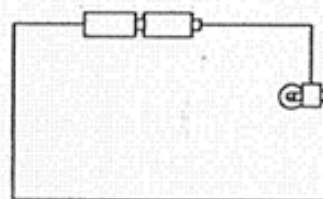
	Plant X	Plant Y
(1)	R	Q
(2)	P	R
(3)	P	Q
(4)	Q	P

15 In which of the following circuits will the bulb most likely light up?

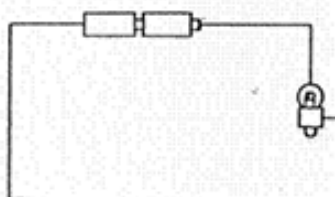
(1)



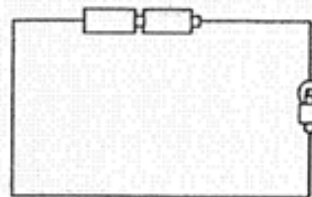
(2)



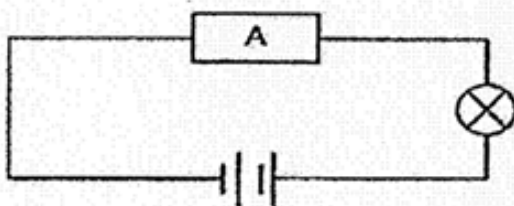
(3)



(4)



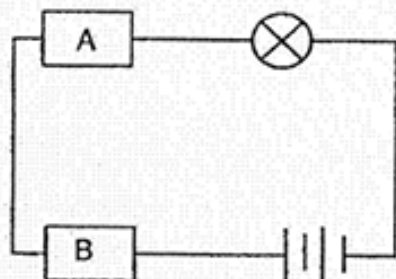
16 Alice sets up an electric circuit as shown below.



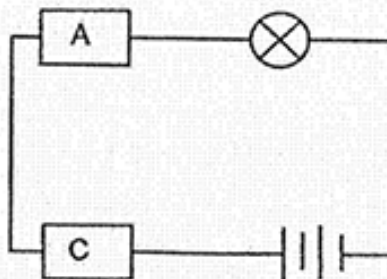
Which one of the following materials could object A be made of to light up the bulb?

- (1) iron
- (2) wood
- (3) plastic
- (4) rubber

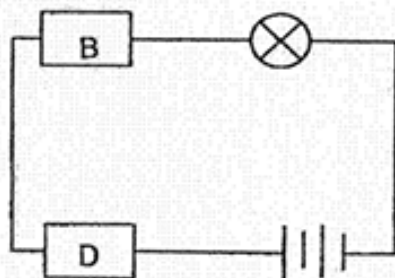
- 17 Alan set up four circuits to find out the conductivity of four different materials, A, B, C and D, as shown below.



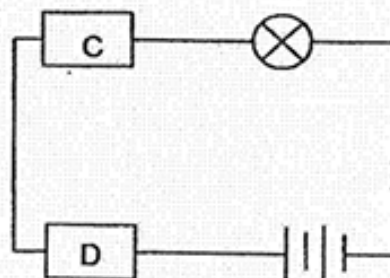
Circuit P



Circuit Q



Circuit R

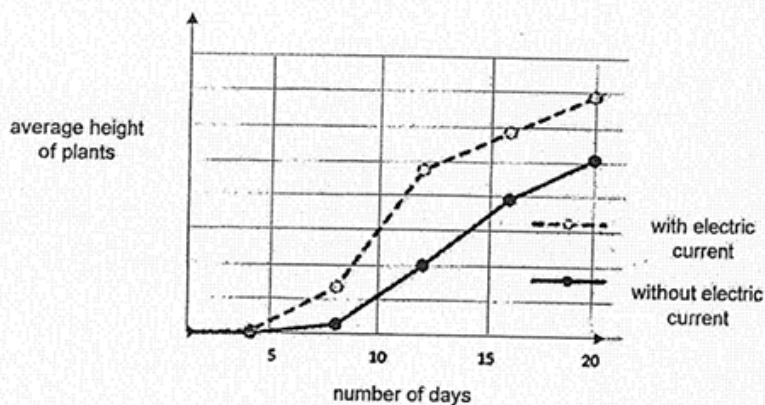


Circuit S

Only the bulbs in circuit Q and S lit up. Based on his observation, which of the following correctly identifies the non-conductor/s of electricity?

- (1) A only
- (2) B only
- (3) A and C only
- (4) B, C and D only

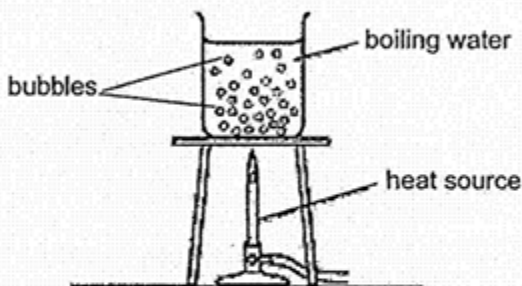
- 18 Alicia investigated to find out what would happen when electric current was passed into plants. She recorded the average height of plants in a graph as shown below.



Explain why the set-up without electric current is needed in her experiment.

- (1) To ensure that the experiment is fair
- (2) To ensure that the results are reliable
- (3) To use the results to find the average height of the plants
- (4) To use the results for comparison to confirm the conclusion

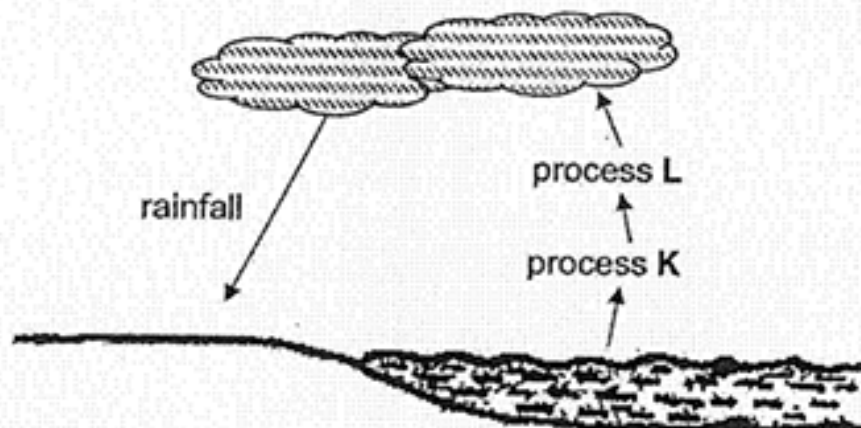
- 19 A beaker of water was heated over a heat source. The water boiled and bubbles were formed throughout the water.



What do the bubbles consist of?

- (1) Oxygen only
- (2) Nitrogen only
- (3) Water vapour only
- (4) Carbon dioxide only

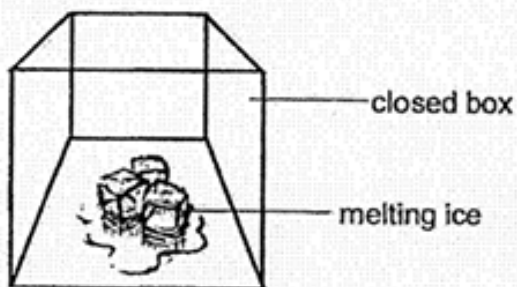
20 The diagram below shows the water cycle at a river.



Which of the following correctly identifies processes K and L?

Process	
K	L
(1) condensation	evaporation
(2) evaporation	evaporation
(3) evaporation	condensation
(4) condensation	condensation

- 21 Mrs Sitoh placed some ice cubes in a closed box. After some time, the ice melted as shown in the diagram below.



Which of the following correctly shows the temperatures of air in the box and the melting ice?

Temperatures of	
air in the box	melting ice
(1) remains the same	increases
(2) increases	remains the same
(3) decreases	remains the same
(4) decreases	increases

- 22 Which one of the followings shows the immediate effects of heat gain and heat loss of water correctly?

	Heat gain	Heat loss
(1)	Misty fans for people to feel cooler	Drying of clothes
(2)	Water dripping from a rice cooker cover	White clouds above a hot kettle
(3)	Dew on leaves	Puddle of water drying up
(4)	Wet towel on forehead to bring down fever	Mirror gets foggy after a hot shower

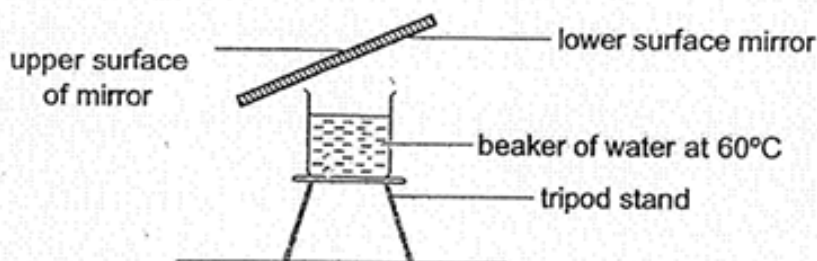
- 23 The table below shows the state of three substances, A, B and C, at different temperatures.

Substance	State of substance at		
	5°C	25°C	50°C
A	solid	solid	solid
B	solid	liquid	liquid
C	liquid	liquid	liquid

Which of the following statements is correct?

- (1) Substance C has the lowest boiling point.
- (2) Substance A has the highest melting point.
- (3) Freezing point of substance B is below 5°C.
- (4) Melting point of substance B is above 50°C.

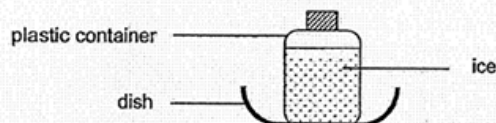
- 24 Jia Le conducted the following experiment.



Which of the following will most likely result in an increase in the amount of water droplets formed on the mirror?

- (1) Remove the tripod stand
- (2) Add ice to the beaker of water
- (3) Place a cold towel on the upper surface of mirror
- (4) Place a hot towel on the lower surface of mirror

- 25 Luke placed four identical plastic containers, A, B, C and D, containing equal amounts of water in a freezer. After five hours, he took the four containers out of the freezer and placed each of them on a dish as shown below.



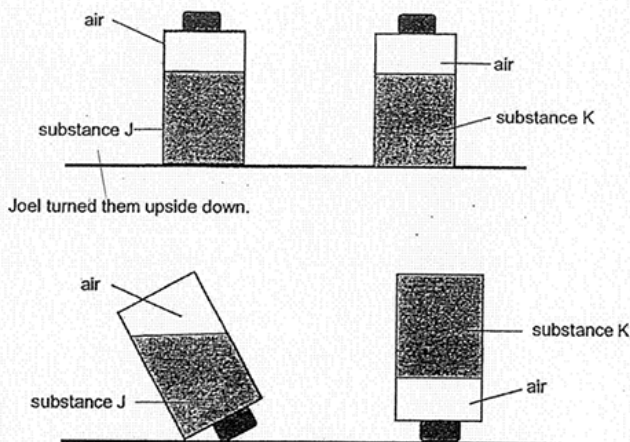
He left the plastic containers at different locations and recorded the amount of water collected on the dishes after fifteen minutes in the table below.

Container	A	B	C	D
Amount of water collected in the dish (cm^3)	3	12	6	9

Based on Luke's results, which one of the following shows the correct order of the temperature of the location where the containers were placed?

	Lowest temperature	Highest temperature
(1)	D	A
(2)	B	A
(3)	A	B
(4)	C	B

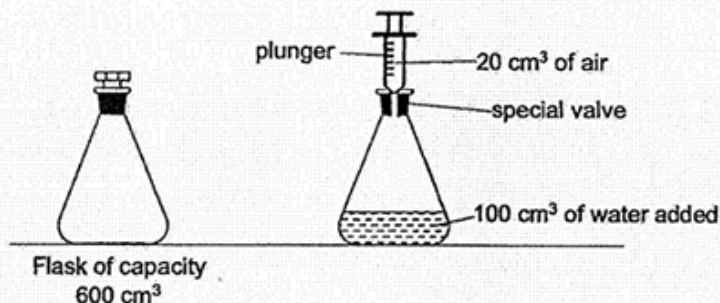
- 26 The diagram below shows two substances, J and K, in similar containers. Each container has a capacity of 300 cm^3 and contained 250 cm^3 of J or K.



Based on the above diagram, which of the following statement is definitely false?

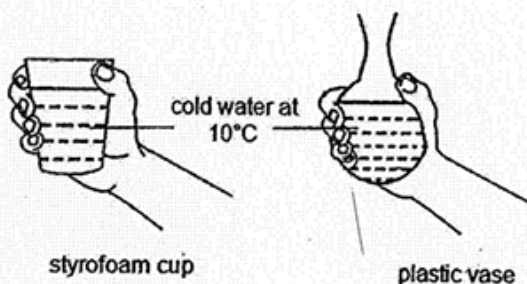
- (1) Substance J is oil
- (2) Substance K is a solid.
- (3) Substance J has a definite volume.
- (4) Substance K has no definite shape but has definite volume.

- 27 In the set-up as shown below, the empty flask has a capacity of 600 cm^3 . 100 cm^3 of water is then poured in. A syringe is used to pump air into the flask. Air pumped into the flask cannot escape due to the special valve. Each time the plunger is completely pushed in, 20 cm^3 of air enters the flask.



What would be the final volume of air in the flask when the plunger is pushed ten times?

- (1) 200 cm^3
 - (2) 500 cm^3
 - (3) 600 cm^3
 - (4) 800 cm^3
- 28 Peter put the same amount of cold water at 10°C into a styrofoam cup and a plastic vase. When he touched them, his hands felt that the plastic vase was colder than the styrofoam cup.



Which of the following explains why Peter's hands felt that the plastic vase was colder than the styrofoam cup?

- (1) The plastic vase gained heat slower than the styrofoam cup.
- (2) The plastic vase conducted heat faster than the styrofoam cup.
- (3) The plastic vase had a lower temperature than the styrofoam cup.
- (4) The plastic vase had more contact with the hand than the styrofoam cup.

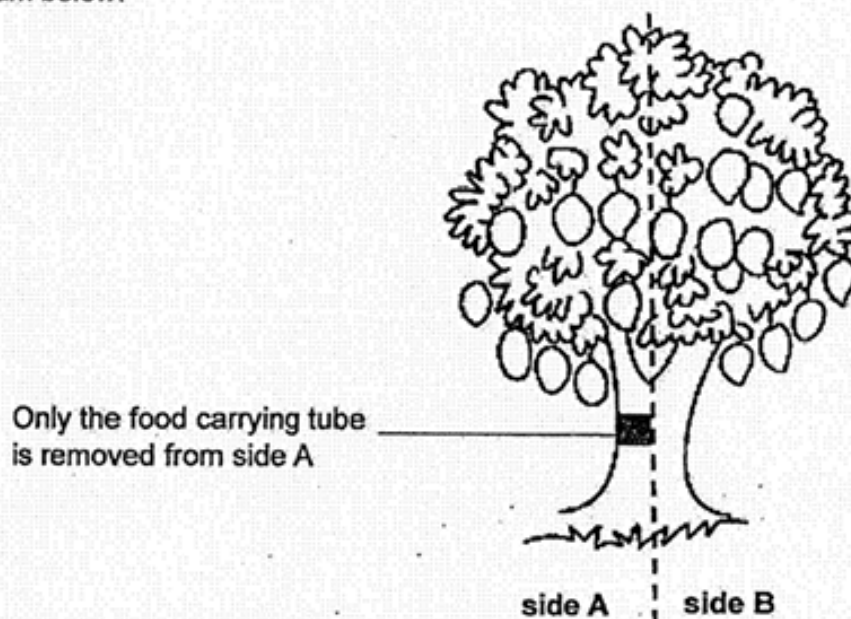
For questions 29 to 40, write your answers in the space provided. **(44 Marks)**

- 29** Richard studied the information about four cells, P, Q, R and S.
 A tick (✓) indicates the presence of the part of a cell.

Parts of a Cell	Cell			
	P	Q	R	S
cell membrane	✓	✓	✓	✓
chloroplast				✓
cytoplasm	✓	✓	✓	✓
cell wall	✓			✓
nucleus	✓	✓		✓

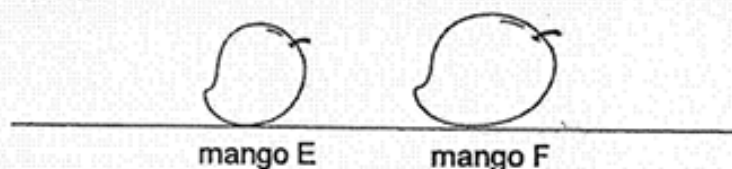
- (a) Based on the information in the table above, which cell(s) is/are taken from an animal? [1]
- _____
- (b) Which one of the cells, P, Q, R or S, cannot reproduce? Give a reason. [1]
- _____
- _____
- (c) Richard claims that cell P is not taken from a leaf. Do you agree with him? Explain why. [1]
- _____
- _____
- _____

- 30 Eric removed the outer ring of the bark from a mango tree as shown in the diagram below.



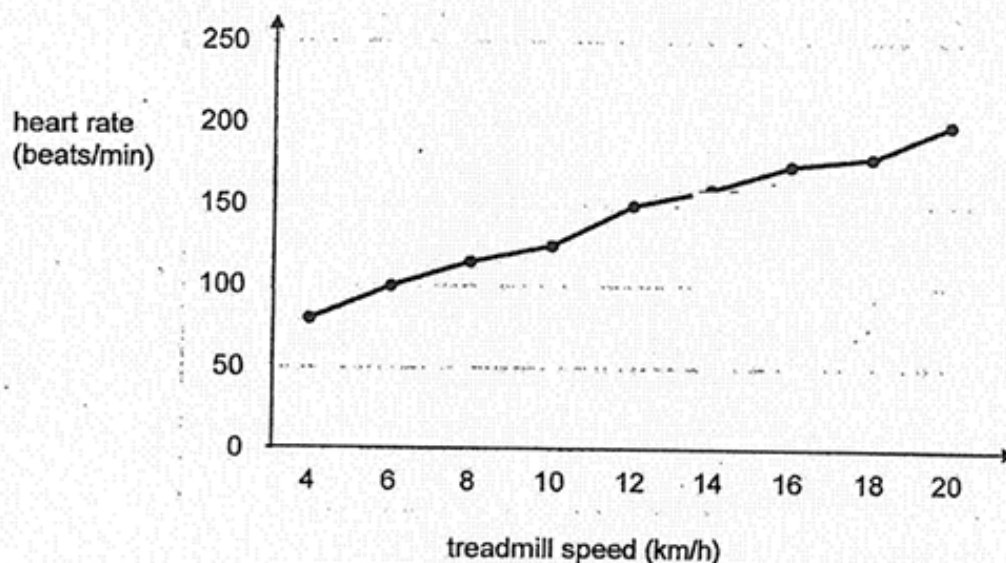
- (a) Name two substances that can still be transported to the leaves on side A. [2]

The diagram below shows two mangoes taken from sides A and B of the tree after 1 week.



- (b) Which mango is plucked from side A? Explain your answer. [2]

- 31** The graph below shows how Claire's heart rate changes as she exercises on a treadmill.



- (a) What is the relationship between the treadmill speed and the heart rate? [1]

- (b) Besides the heart, name two other parts in the human circulatory system. [1]

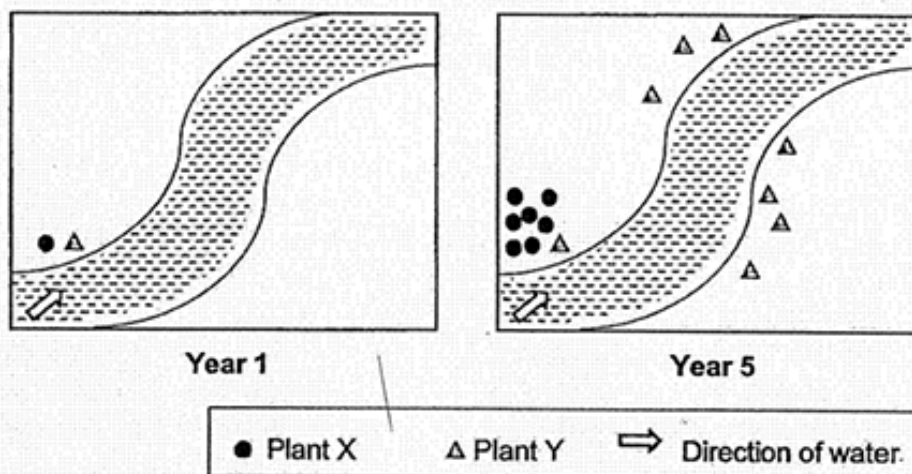
- (c) Based on the graph, Claire made the following inference.

"The heart beats faster during an exercise to supply the body with more blood".

Do you agree with Claire? Explain why.

[2]

- 32 The diagrams below show the number of plants X and Y on an island over five years.



- (a) Study the two fruits below carefully.

Which of the following is likely to be the fruit of Plant Y?
Put a tick in the box.

[1]


☐

☐

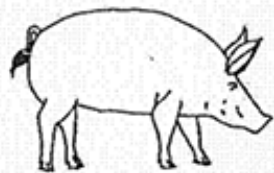
- (b) State a characteristic of the fruit of plant Y that helps in its dispersal.

[1]

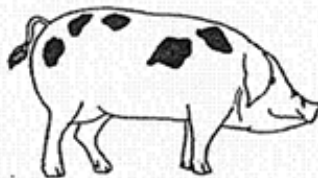
- (c) The young plants of X did not grow very well. Explain why.

[2]

33**(a)** Explain why reproduction is important.**[1]**

(b) Study the pictures below. The young inherited characteristics from its parents.

male adult



female adult

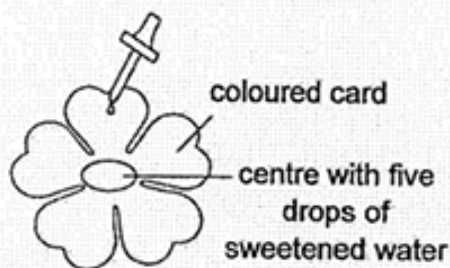


young

State one physical characteristic that the young has inherited from the female adult.

[1]

- 34 Jess wanted to find out which is the colour that bees are most attracted to. She made model flowers using different coloured cards. She placed five drops of the same sweetened water at the centre of each flower as shown below. The model flowers were left in an open field.



- (a) Name one other constant variable other than the conditions mentioned in the experiment above. [1]

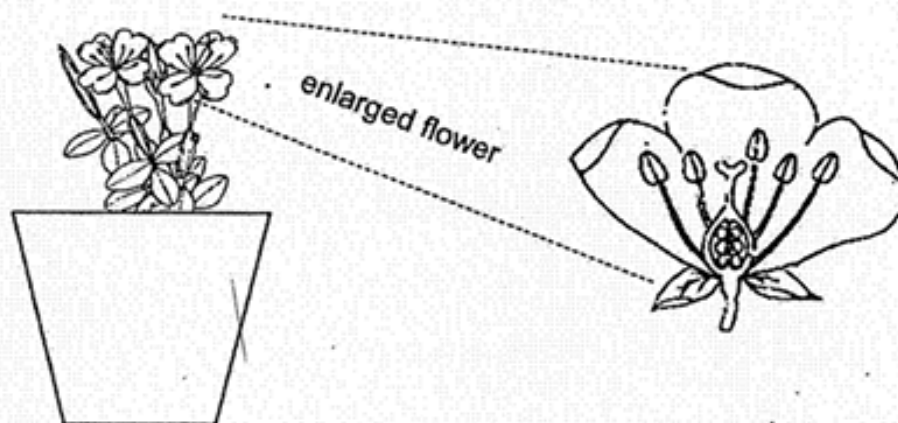
Jess then recorded the number of bees that visited the model flowers over three hours. Her results are shown below.

Colour of flower	Number of bees visiting the flower		
	1 st hour	2 nd hour	3 rd hour
purple	10	16	9
blue	6	5	3
red	1	3	1

- (b) What is the conclusion for her experiment? [1]

(c) Jess carried out an experiment to prove that the following hypothesis is correct.

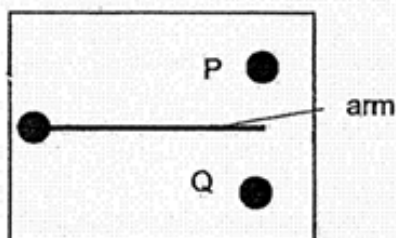
“Flowers can be pollinated by other flowers of the same plant naturally.”



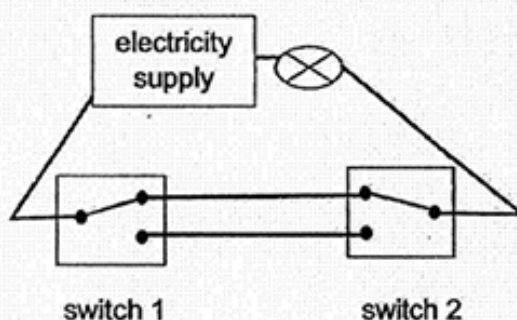
(i) Using the plant above, briefly state the steps for her experiment. [2]

(ii) What would she observe to prove the hypothesis correct? [1]

- 35 The diagram below shows a two-way switch. The arm of the switch can be moved to touch points, P or Q.

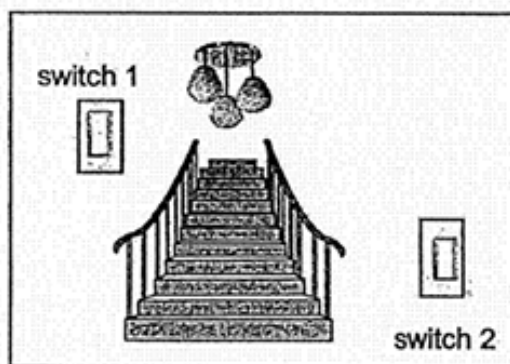


The electrical circuit shown below has two switches, 1 and 2. Both the switches are two-way switches.

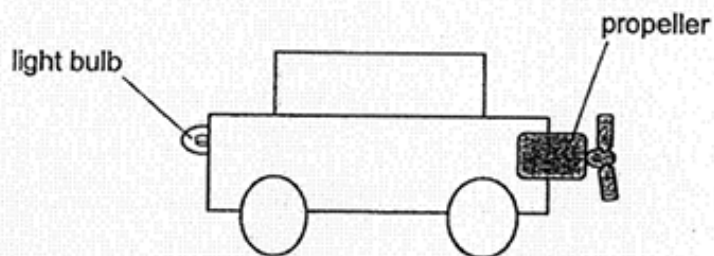


- (a) When both the switch arms are moved to touch the points as shown above, will the bulb light up? Explain why. [1]

- (b) What is the function of a two-way switch at a staircase and how is it useful? [2]



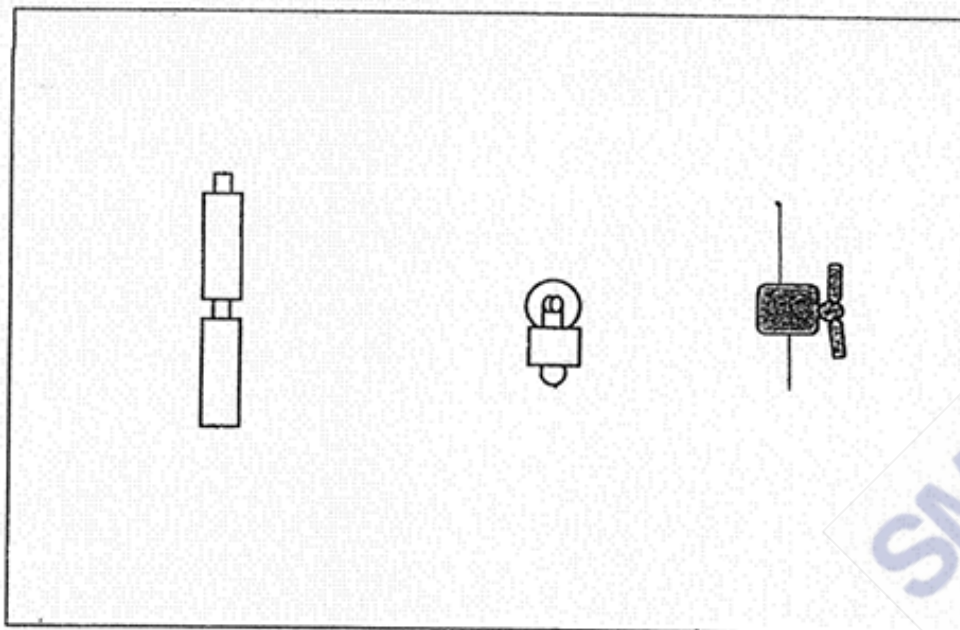
- 36 Aaron designed a toy car as shown in the diagram below.



The table below shows the observations of the toy car when either or both switches, Q and R, are switched on.

Switch Q	Switch R	Observations of toy car
on	on	The propeller is moving. The light bulb is lit.
on	off	The propeller is not moving. The light bulb is lit.
off	on	The propeller is moving. The light bulb is not lit.

- (a) Using wires and two switches, complete the drawing of the electrical circuit for the toy car in the box below. [3]

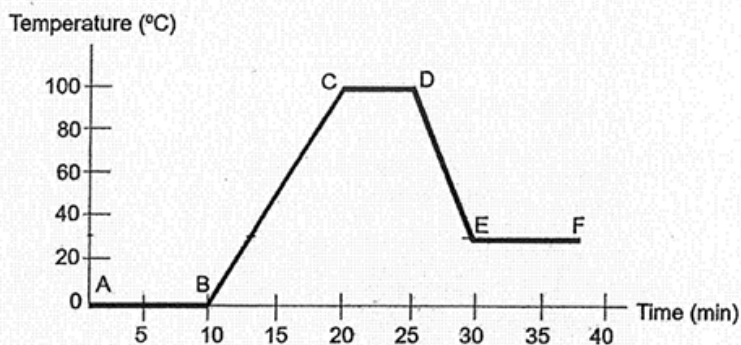


Aaron wished to make some changes in the toy car.

- (b) Suggest what Aaron should do to the electrical circuit in the toy car. [2]

	Change in the Toy Car	Suggest what Aaron should do to the electrical circuit in the toy car.
(i)	Propeller spins faster.	
(ii)	More light from two bulbs without slowing the speed of the propeller.	

- 37 Diyanah conducted an experiment using a beaker of water. She drew a graph to show the temperature of water over time as shown below.



- (a) Name the processes which took place at AB and CD. [2]

AB: _____

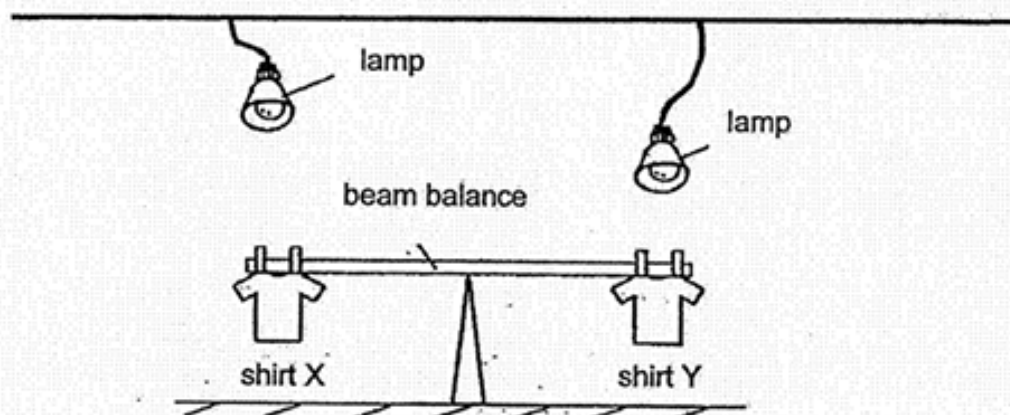
CD: _____

- (b) Answer the following questions based on the graph: [1]

- (i) what could be the temperature of the room where the beaker is placed?

- (ii) state the time of the experiment when the heat source was turned off.

- 38 Raja wanted to find out if temperature of surrounding air affects the rate of evaporation. He wet two identical shirts, X and Y, with the same volume of water. He then placed two similar lamps at different distances from the shirts as shown below.

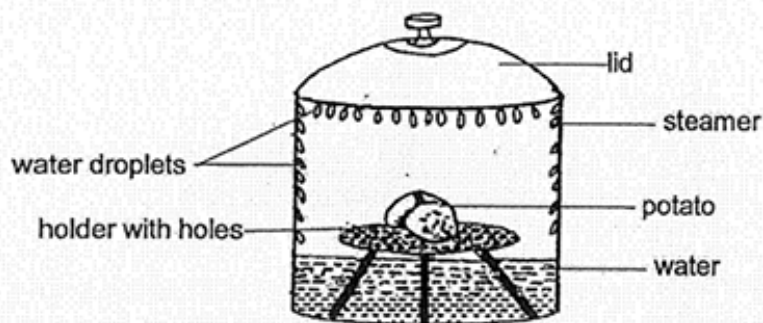


- (a) What is the purpose of the lamps in the set-up? [1]

- (b) After three hours, the beam balance ^{tilted} ~~tilted~~ downwards towards shirt X. Explain why. [2]

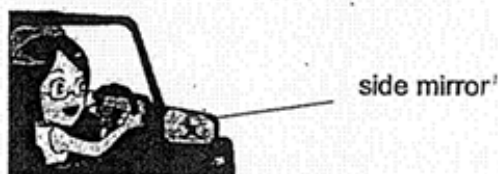
- (c) After five hours, the beam balance returned to the original position. Explain why. [1]

- 39 Jane used an electric steamer to cook some potatoes. She turned on the steamer and after some time, the water in the steamer boiled. She observed that there were many water droplets formed on the inner surface of the steamer.



- (a) Explain how the water droplets were formed on the inner surface of the steamer. [2]

- (b) Jane drives a car.

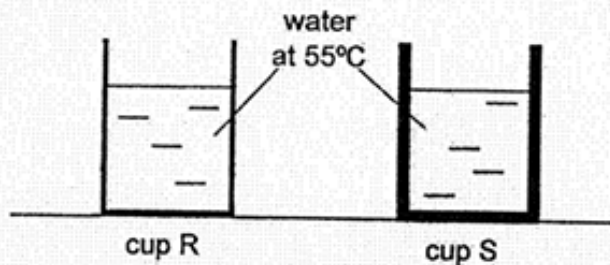


The side mirror of a car is important for her. The side mirror is fitted with heating wires inside the mirror as shown below.



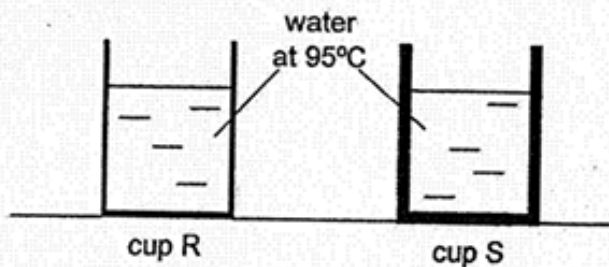
Explain how fitting with heating wires help when she drives on a rainy day. [1]

- 40 James had two cups made of the same material but different thickness. He poured 200ml of water at 55°C into each cup at the same time as shown below.



- (a) When James touched the cups, he observed that cup R felt hot immediately while it took some time for cup S to feel hot. Explain why this happened. [2]

James refilled the cups with water at 95 °C into the two cups, R and S, as shown below.



- (b) After pouring 200ml of water at 95°C into each glass cup, James observed that cup S cracked while cup R did not. Explain why cup S cracked. [2]


The End

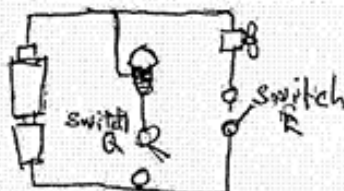
ANSWER SHEET

Q1	2
Q2	1
Q3	4
Q4	4
Q5	4
Q6	2
Q7	4
Q8	4
Q9	1
Q10	3
Q11	4
Q12	1
Q13	4
Q14	2

Q15	2
Q16	1
Q17	2
Q18	4
Q19	3
Q20	3
Q21	3
Q22	4
Q23	12
Q24	3
Q25	3
Q26	4
Q27	2
Q28	2



Q29	<p>(a) Q, R</p> <p>(b) Cell R. The cell does not have a nucleus which is needed for reproduction.</p> <p>(c) Yes, as cell P does not have chloroplast. Only leaf cells have chloroplast to make food.</p>
Q30	<p>(a) Water and Mineral salt</p> <p>(b) Mago F, the food-carrying tubes have been removed from side A. Hence, food made by the leaves cannot be transported below the cut. Thus, the excess food is transported to and stored in the mango, making it bigger.</p>
Q31	<p>(a) As the treadmill speed incrwases, the heart rate also increases.</p> <p>(b) Blood, Blood vessels</p> <p>(c) No, as the heart only pumps blood faster. The heart pumps blood faster to send more oxygen and digested food to all parts of the body.</p>
Q32	 <p>(a)</p> <p>(b) Fibrous husk that traps air.</p> <p>© The young plants are near the parent plant. The young plant have to compete for sunlight, water, space and nutrients.</p>
Q33	<p>(a) Reproduction is important to ensure continuity of its own kind.</p> <p>(b) Black spots on the body.</p>
Q34	<p>(a) Size of the flower</p> <p>(b) Bees are most attracted to the colour purple.</p>

	c)	(i)	Remove all the anthers of one flower. Have one other flower with anthers.
		(ii)	The flower without anthers will become a fruit.
Q35	a)	Yes, as it will form a closed circuit.	
	b)	The lights can be controlled independently by switch 1 and 2	
Q36	a)		
	b)	(i)	Add more batteries
		(ii)	Put the two bulbs in parallel
Q37	a)	AB : Melting CD : Boiling	
	b)	(i)	30°C
		(ii)	25 mins
Q38	a)	To increase the temperature of surrounding air.	
	b)	The lamp is further from X and the temperature of surrounding air is lower. Thus less water in shirt X gained heat and evaporated slower so X has more mass	
	c)	shirt x has also dried up and now both shirt are of the same mass.	

Q39	a)	Water in the potato gained heat to become water vapour. Water vapour came in contact with the cooler surface of the lid, lost heat and condenses to form water vapour.	
	b)	The heating wires keeps the side mirror hot and when rain touches the hotter surface, they will evaporate to form water vapour	
Q40	a)	Cup S the glass is thicker so the heat travels from the hot water to the hand slower.	
	b)	The inner surface of Cup S gained heat and expanded faster than the outer surface	

ROSYTH SCHOOL WA1 PAPER

For each question from 1 to 14, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4) and shade your answer on the Optical Answer Sheet.

[28 Marks]

1 Which of the following characteristics are similar between animals and plants?

- A: Both grow
- B: Both reproduce
- C: Both grow towards sunlight
- D: Both need air, food and water to carry out life processes

- (1) A and B only
- (2) C and D only
- (3) A, B and D only
- (4) A, B, C and D

2 The table below shows the characteristics of three animals, A, B and C.

	Animal A	Animal B	Animal C
Where it lives	water	land	water
Its outer covering	hair	scales	scales
How it reproduces	gives birth	lays eggs	lays eggs

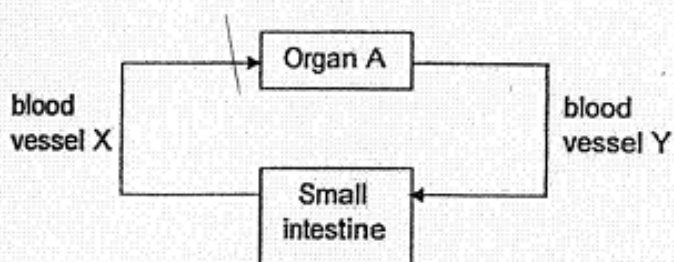
Which of the following shows the groups that animals A, B and C most likely belong to?

	Animal A	Animal B	Animal C
(1)	mammal	reptile	amphibian
(2)	mammal	reptile	fish
(3)	amphibian	fish	reptile
(4)	amphibian	mammal	fish

3 Which one of the following statements is true about human digestive system?

- (1) Digestion begins in the stomach.
- (2) Digested food is absorbed in the gullet.
- (3) Excess water is absorbed in the large intestine.
- (4) Undigested food is absorbed into the bloodstream.

4 The chart below shows how oxygen and digested food are transported in the human body.



Which of the following is correct?

	Organ A	Oxygen at X compared to Y	Digested food at Y compared to X
(1)	Lungs	Less	More
(2)	Lungs	More	Less
(3)	Heart	Less	More
(4)	Heart	Less	Less

5 The air we breathe out _____ than the air that we breathe in.

- (1) is cooler
- (2) has more oxygen
- (3) has less water vapour
- (4) has more carbon dioxide

- 6 Mr Sim observed that his resting breathing rate is faster at an altitude of 5000m compared to at an altitude of 0 m. 'Altitude' refers to the height above sea level as shown in the diagram.



Based on the altitude, which of the following table shows the percentage of oxygen in inhaled air and his resting heart rate correctly?

(1)

altitude (m)	percentage of oxygen in inhaled air (%)	resting heart rate
0	20.9	70
5000	11.2	95

(2)

altitude (m)	percentage of oxygen in inhaled air (%)	resting heart rate
0	11.2	70
5000	20.9	95

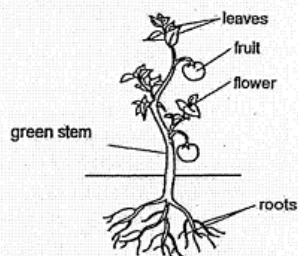
(3)

altitude (m)	percentage of oxygen in inhaled air (%)	resting heart rate
0	20.9	95
5000	11.2	70

(4)

altitude (m)	percentage of oxygen in inhaled air (%)	resting heart rate
0	20.9	70
5000	20.9	70

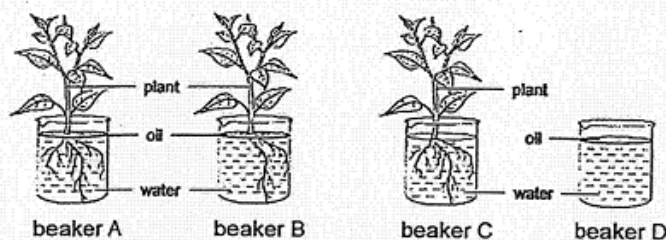
7 The diagram below shows a plant.



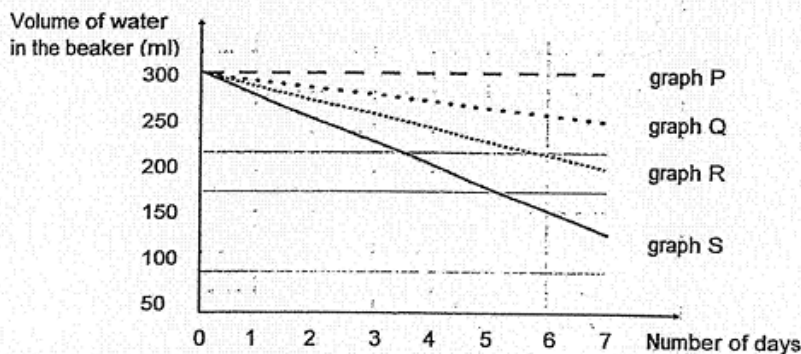
Which statement is not true about the above plant?

- (1) Food is made in the green stem and leaves.
- (2) Food-carrying tubes are found in the green stem.
- (3) Food and oxygen are transported to the fruit from the stem.
- (4) Food is transported from the leaves to the fruit, stem and roots.

8 Ahmad prepared four set-ups using four similar beakers A, B, C, D as shown in the diagram below. All the beakers have 300 ml of water. Beakers A, B and D have a layer of oil but not Beaker C. He placed the set-ups next to an open window.



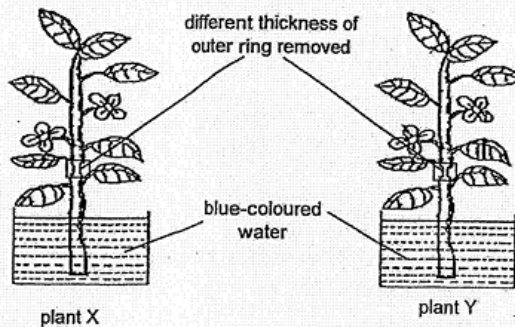
He observed the volume of the water in the four beakers over seven days and recorded the results in the graph shown below.



Which of the following beakers correctly match with graphs, Q and R?

	Graph Q	Graph R
(1)	D	A
(2)	D	B
(3)	B	C
(4)	B	A

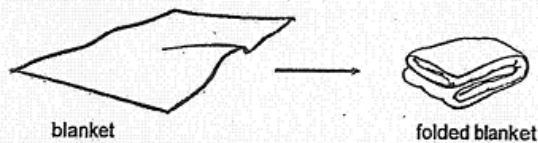
- 9 June conducted an experiment using two identical plants X and Y. She cut out different thickness of the outer ring of the stems in plants X and Y.



After one day, June observed that flowers of plant X turned blue but flowers of plant Y remained white. Which one of the following explains June's observation?

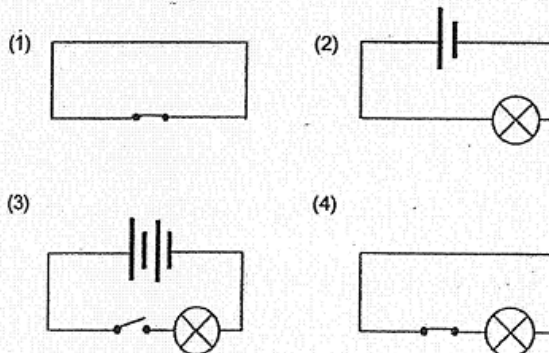
Type of tube(s) removed in		
	Plants X	Plants Y
(1)	food carrying tubes only	food and water carrying tubes
(2)	food carrying tubes only	none
(3)	none	food carrying tubes only
(4)	food and water carrying tubes	food and water carrying tubes

- 10 Peter folds his blanket every morning after getting off from bed as shown below.



The blanket can be folded because it is _____.

- (1) soft
 - (2) strong
 - (3) flexible
 - (4) waterproof
- 11 Which of the following shows a closed electrical circuit?



- 12 Four metal pins, A, B, C and D, were fixed onto a cardboard. The diagram below shows the pins and front side of the cardboard where the pins were fixed on.

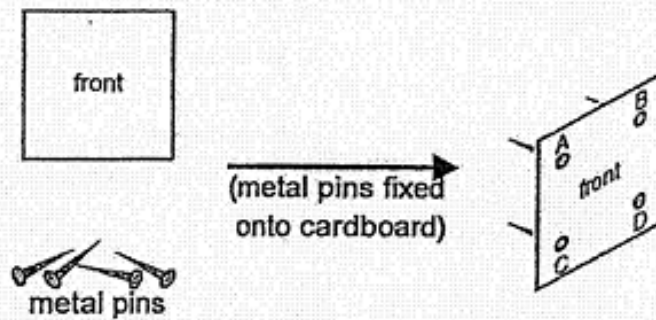
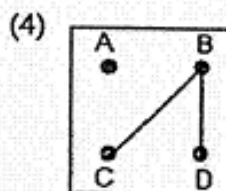
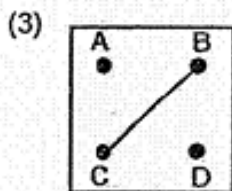
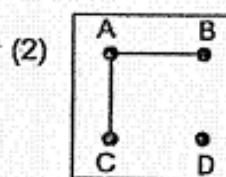
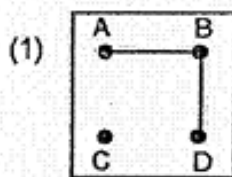


Figure 1

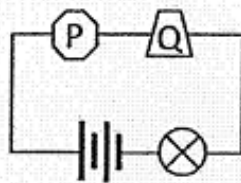
Some of the metal pins were connected with wires behind the cardboard. Gary used a circuit tester with a bulb to connect to different pairs of metal pins. He recorded his results in the table below.

Circuit tester connected to metal pins	Bulb lighted up on circuit tester
A and B	No
B and C	Yes
A and D	No
C and D	Yes

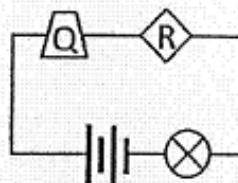
Which one of the following shows the wire connections at the back of the cardboard?



- 13 Paul set up two circuits using objects, P, Q and R. The bulb in the circuit with objects, P and Q, lighted up whereas the bulb in the circuit with objects, Q and R, did not light up.

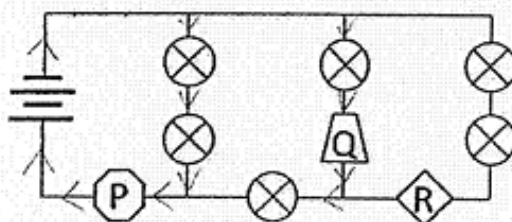


bulb lighted up



bulb did not light up

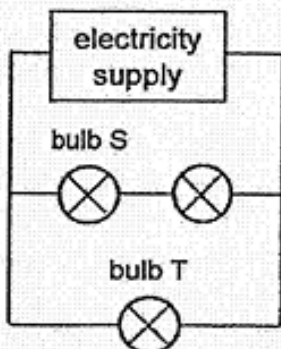
He then set up another new circuit using the same objects, P, Q and R, as shown below.



How many bulbs will be lighted up in the new circuit?

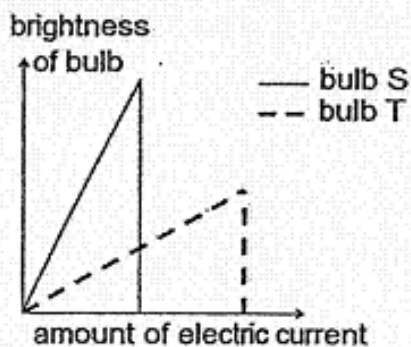
- (1) six
- (2) two
- (3) three
- (4) four

- 14 Jerry set up a circuit below with three bulbs. He wanted to find out how the amount of electric current flowing through the circuit will affect the brightness of bulb S and bulb T.

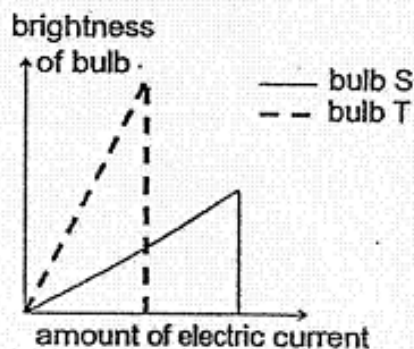


He increased the amount of electric current flowing through the circuit and recorded the brightness of bulb S and T each time, then plotted his findings on a graph. Which graph below would show the results of his experiment?

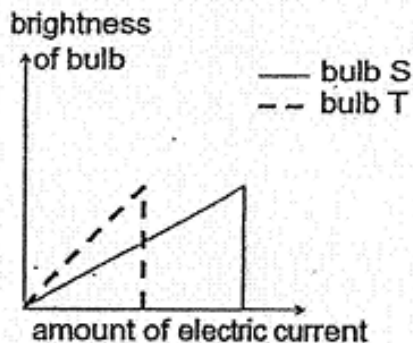
(1)



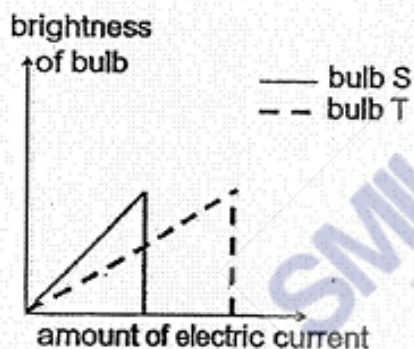
(2)



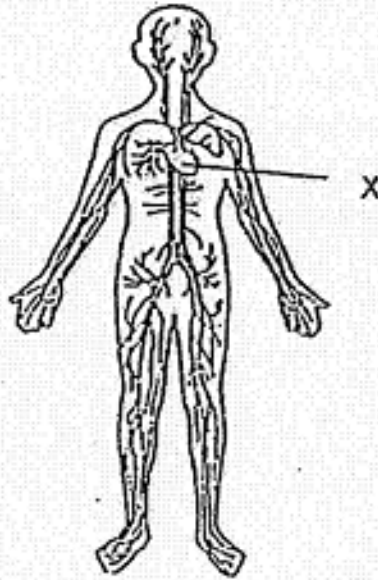
(3)



(4)



15 The diagram shows a human organ system.



(a) Identify the organ system.

[1]

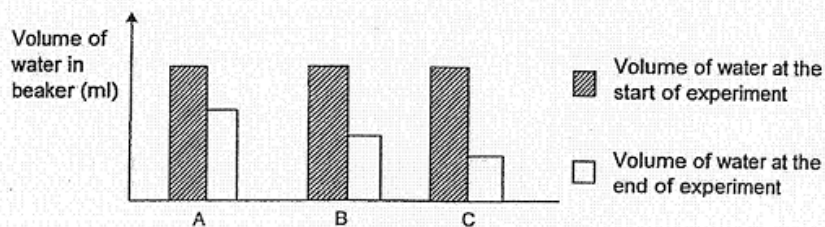
(b) State the function of part X.

[1]

(c) Other than X, name another two parts of this system.

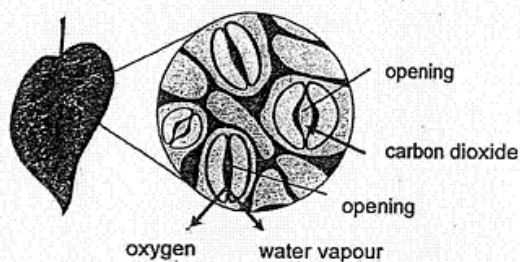
- 16 Ahmad carried out an experiment using similar plants with different number of leaves in three set-ups A, B and C as shown below.

Set-up	A	B	C
Number of leaves on the plant	20	30	40



- (a) Based on the graph, what is the relationship between the number of leaves on the plant and the volume of water in the beaker at the end of the experiment? [1]

Ahmad studied the leaf diagram under a microscope showing the openings. The arrows show the movement of gases such as carbon dioxide, oxygen and water vapour through the openings when the plant is placed in the presence of light.

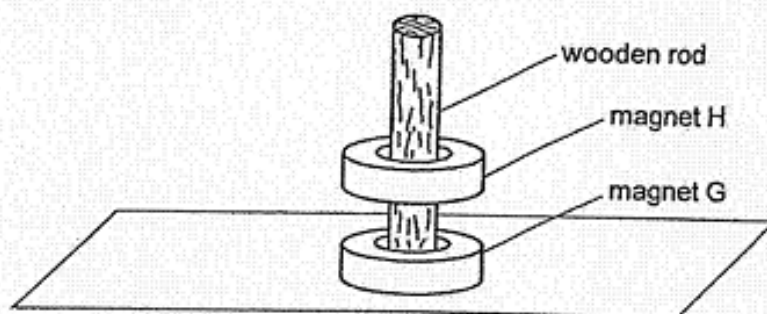


Question 16 is continued on the next page

- (b) What is the name of the opening? [1]

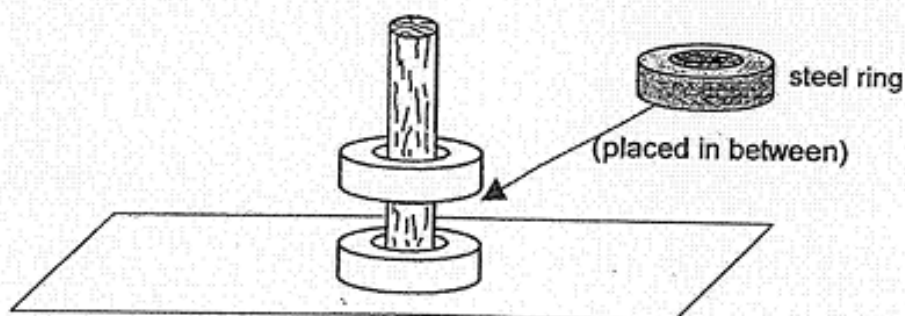
- (c) Using the graph and the leaf diagram, explain why some trees shed most of their leaves in a dry season. [2]

- 17 Karl placed a magnet H above magnet G through a wooden rod and observed magnet H suspended in the air as shown below.



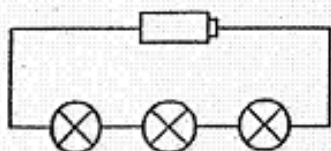
- (a) Explain why magnet H would be suspended above magnet G. [1]

- (b) Karl removed magnet H and inserted a steel ring, then placed magnet H back into the wooden rod without flipping it.

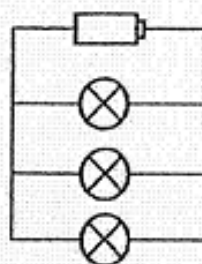


- What is the change Karl will observe? Explain the observation. [2]

- 18 Jacob set up two circuits, 1 and 2, for an experiment.



Circuit 1



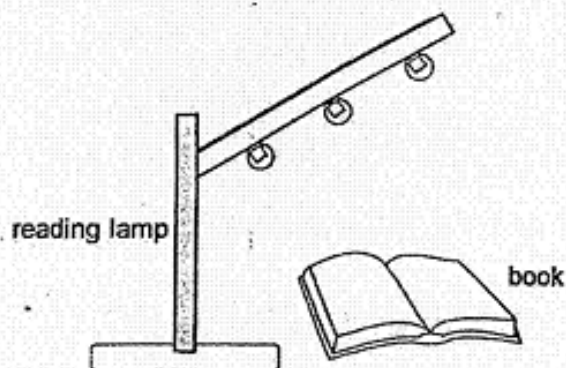
Circuit 2

Jacob measured the time the bulbs in each circuit remained lighted up.

- (a) What is the aim of Jacob's experiment?

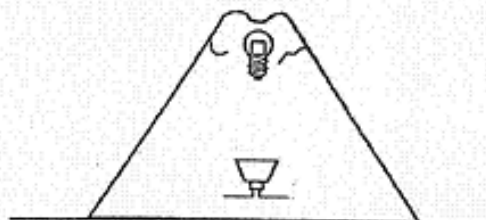
[1]

- (b) Jacob wants to set up a circuit for a battery-operated reading lamp.



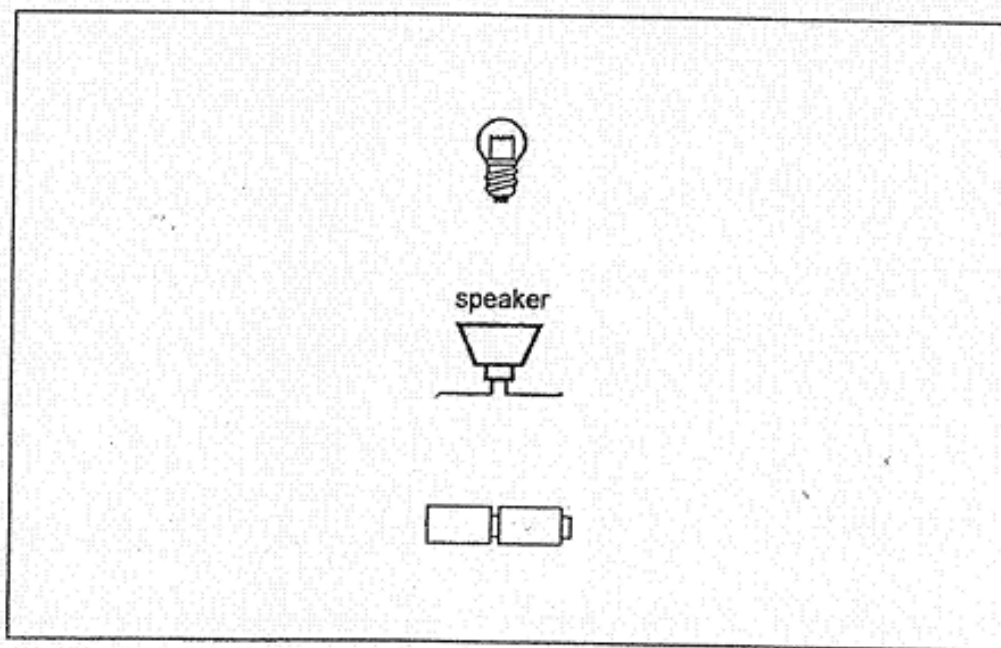
Which circuit, 1 or 2, would you suggest for this reading lamp? Explain why. [2]

- 19 Khairul wants to make a toy volcano that can light up at the top and make some sound.



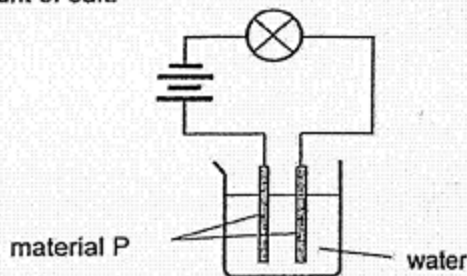
Toy volcano

- (a) Using wires and two switches, draw the electric circuit diagram for the toy volcano in the box below.
- The bulb should light up as brightly as possible.
 - The volcano should be able to light up and make sounds independently. [3]



- (b) Suggest one way that Khairul can make his toy produce a louder sound. [1]

- 20 Nanda set up an experiment below to test the electrical conductivity of water with different amount of salt.



He recorded his results in a table.

Amount of salt in 100ml of water (g)	Electrical conductivity (unit/km)
0	0
10	5
30	10
50	10

- (a) What could material P be made of? [1]
- _____
- (b) State one variable about material P that must be kept the same for a fair test. [1]
- _____
- (c) What is the relationship between the amount of salt in the water and electrical conductivity of the water? [2]
- _____
- _____
- _____
- (d) Nanda did the experiment with no salt added as a control set-up. What is the purpose of having a control set-up? [1]
- _____


End of Paper

ANSWER SHEET

Booklet A

Q1	3	Q2	2	Q3	3	Q4	4	Q5	4
Q6	1	Q7	3	Q8	4	Q9	1	Q10	3
Q11	2	Q12	4	Q13	4	Q14	2		

Booklet B

Q15	(a) Circulatory system (b) The function of X is to pump blood to transport digested food, water and oxygen to all parts of the body and transport carbon dioxide to the lungs for removal. (c) Blood, blood vessels.
Q16	(a) As the number of leaves increases, the volume of water at the end of the experiment decreases. (b) Stomata (c) The lesser number of leaves, the lesser the volume of water lost through the stomata, so less water is taken in by the plant.
Q17	(a) Magnet. H's and G's like poles are facing each other and since like poles repel, H and G is repelling each other. (b) H will drop as magnetic force cannot pass through the steel ring.
Q18	(a) To find out how the arrangement of the bulbs will affect the time the bulb in each circuit remained lighted up. (b) Circuit 1, arrange light bulbs in series, so that the bulbs will last for a longer period of time.
Q19	 (a) (b) Add another speaker in parallel to the first speaker.
Q20	(a) Steel (b) Thickness of material P

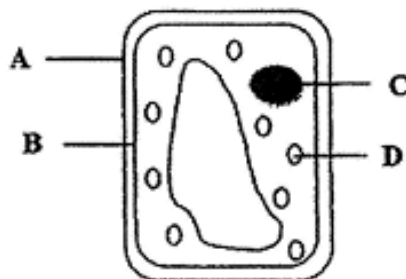
- (c) As the amount of salt in 100ml of water increases from 0 to 30g, the electrical conductivity increases from 0 to 10. As the amount of salt in water increases from 30g to 50g, the electrical conductivity remains the same.
- (d) To compare and confirm that the electrical conductivity of water is only due to the amount of salt.

RULANG PRIMARY SCHOOL EOY PAPER

Section A (28 x 2 marks)

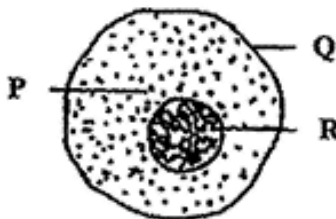
For each of the questions from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet.

1. The diagram below shows parts of a plant cell, A, B, C and D.



Which parts are also found in an animal cell?

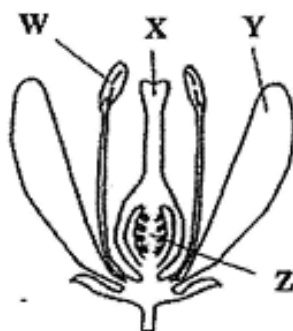
- (1) A and C
 - (2) A and D
 - (3) B and C
 - (4) B and D
2. The diagram below shows three parts of a cheek cell, P, Q and R.



Which one of the following statements is true?

- (1) R is a jelly-like substance.
- (2) Q gives the cell its fixed shape.
- (3) P controls all activities in the cell.
- (4) R contains genetic information of the cell.

3. Study the flower shown below.



Two parts of the flower were removed. After some time, the flower could still develop into a fruit. Which two parts of the flower were removed?

- (1) W and X
 - (2) W and Y
 - (3) X and Z
 - (4) Y and Z
4. Seeds A, B and C from the same plant are placed under the conditions in the table shown below.

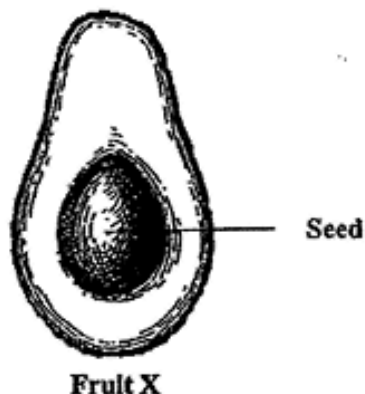
Seed	Conditions			
	Air	Light	Water	Temperature (°C)
A	✓	✓	✓	25
B	✓	×	✓	25
C	×	✓	✓	4

Key:
 ✓ present
 × absent

Which seed(s) will germinate after a few days?

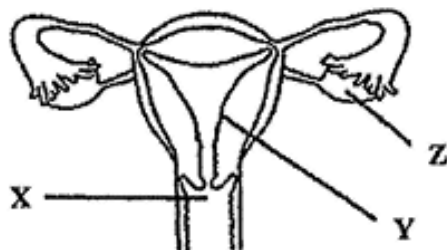
- (1) A only
- (2) B only
- (3) A and B only
- (4) B and C only

5. The diagram below shows a cross-section of fruit X.



- Which one of the following statements is most likely true about the flower which fruit X has developed from?
- (1) The flower has only one ovule.
 - (2) The flower does not have a stigma.
 - (3) The flower does not have an ovary.
 - (4) The flower has been pollinated but not fertilised.

6. The diagram below shows the human reproductive system.

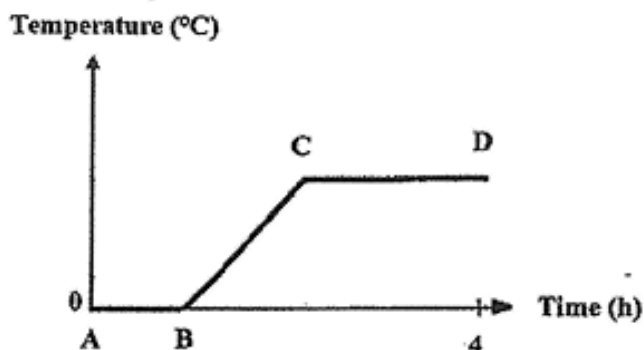


Which of the following statements is/are true?

- A: Z is where the egg fuses with the sperm.
 B: X is where female reproductive cells are produced.
 C: Y is where the fertilised egg develops into a baby.

- (1) A only
- (2) C only
- (3) A and B only
- (4) B and C only

7. A beaker containing ice cubes has been left on the table for 4 hours. The graph below shows the change in temperature of the contents of the beaker.



Which one of the following statements is correct?

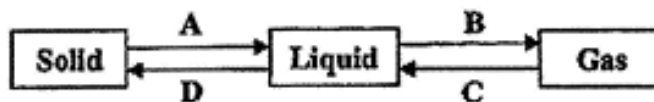
- (1) The ice cubes only gain heat from C to D.
 - (2) The ice cubes have started to boil from C to D.
 - (3) All ice cubes are still found in the beaker from B to C.
 - (4) Some ice cubes and water are in the beaker from A to B.
8. A block of ice is placed in a closed box as shown in the diagram below.



During melting, what will happen to both the ice and the temperature of air in the box?

	Ice	Temperature of air in the box
(1)	Gains heat	Decreases
(2)	Loses heat	Decreases
(3)	Gains heat	Remains the same
(4)	Loses heat	Remains the same

9. The diagram below shows the changes in the states of a substance.



What are the processes A, B, C and D?

	A	B	C	D
(1)	Melting	Boiling	Condensation	Freezing
(2)	Freezing	Boiling	Evaporation	Condensation
(3)	Freezing	Evaporation	Condensation	Melting
(4)	Melting	Evaporation	Freezing	Condensation

10. The table below shows the freezing and boiling points of four different substances, P, Q, R and S.

Substance	Freezing point ($^{\circ}\text{C}$)	Boiling point ($^{\circ}\text{C}$)
P	8	26
Q	93	104
R	15	65
S	46	200

Which substance will be a liquid at 40°C ?

- (1) P
- (2) Q
- (3) R
- (4) S

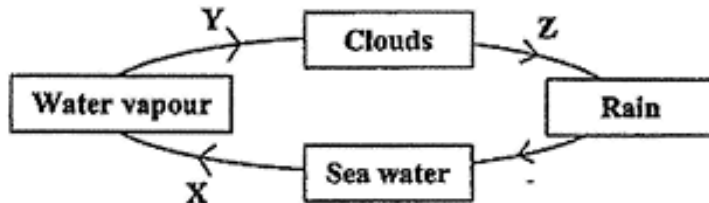
11. Enoch wants to find out if the surrounding temperature affects the rate of evaporation of water. He prepared three set-ups, A, B and C, using three beakers of water. The table below shows the variables of his experiment.

	Set-up		
	A	B	C
Temperature ($^{\circ}\text{C}$)	X	28	34
Exposed surface area of water (cm^2)	60	Y	60
Volume of water (cm^3)	400	400	Z

What should be the values of X, Y and Z for his experiment to ensure a fair test?

	X	Y	Z
(1)	40	100	400
(2)	40	60	500
(3)	20	60	400
(4)	20	100	500

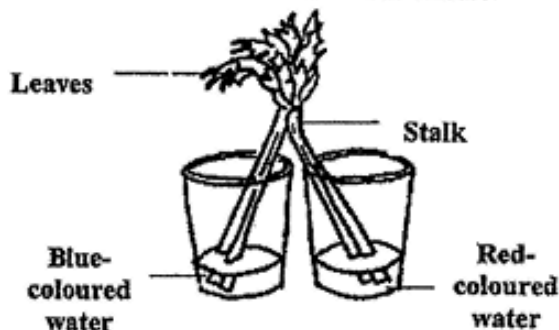
12. The diagram below shows the water cycle.



Which one of the following is correct?

	Evaporation occurs at	Condensation occurs at
(1)	X	Y
(2)	X	Z
(3)	Y	Z
(4)	Z	X

13. Tanya cut the stalk of a celery into two equal parts and placed each part in a beaker. Both beakers contain the same amount of water in 2 different colours.



After two hours, she observed that some parts of the celery stalk and leaves had turned blue or red. What could she conclude from her observations?

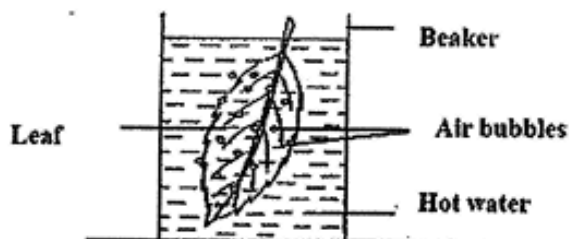
- A: The parts that had turned blue or red contained water-carrying tubes.
 B: The water-carrying tubes transported the coloured water to the leaves.
 C: The food-carrying tubes transported the coloured water to the different parts of the stalk.

- (1) B only
 (2) C only
 (3) A and B only
 (4) A, B and C
14. Faith wrote some statements about the respiratory systems of a human and a fish. Which one of the following statements is correct?
- (1) Gaseous exchange takes place in the lungs of a fish.
 (2) Oxygen is transported by the blood in a human and a fish.
 (3) Water rich in carbon dioxide passes out through the mouth of a fish.
 (4) The windpipe is part of the respiratory system in a human and a fish.
15. A group of children were trapped in a lift. After one hour, they felt uncomfortable as the composition of air in the lift changed.

Which one of the following shows correctly the changes in the composition of oxygen and water vapour after the children were trapped in the lift for one hour?

	Change in amount of oxygen after one hour	Change in amount of water vapour after one hour
(1)	Increased	Stayed the same
(2)	Stayed the same	Decreased
(3)	Increased	Decreased
(4)	Decreased	Increased

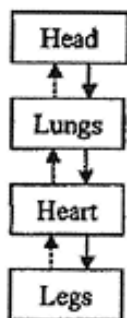
16. Wendy put a leaf in a beaker of hot water. After a while, she noticed that a lot of air bubbles appeared on the lower surface of the leaf but only a few air bubbles were found on the upper surface of the leaf.



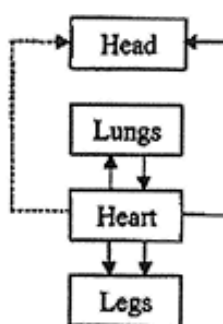
What could be a possible reason for these observations?

- (1) More air is taken in by the tiny openings on the upper surface of the leaf.
 - (2) The number of tiny openings found on both lower and upper surfaces is the same.
 - (3) There are more tiny openings on the lower surface than the upper surface of the leaf.
 - (4) There are more tiny openings on the upper surface than the lower surface of the leaf.
17. Which one of the following correctly represents the direction of blood flow to certain parts of the human body?

(1)



(2)

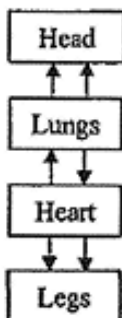


Key:

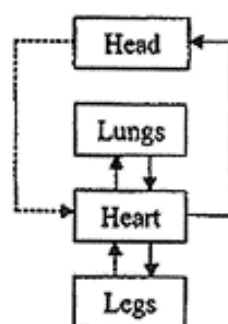
→
Oxygen-rich blood

---→
Carbon dioxide-rich blood

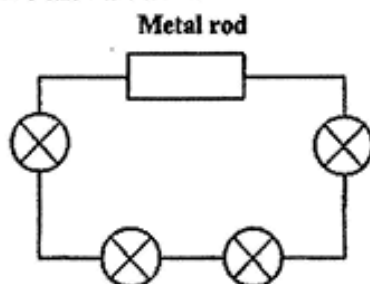
(3)



(4)



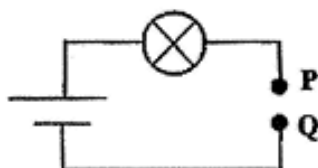
18. Jaycus set up a circuit as shown below.



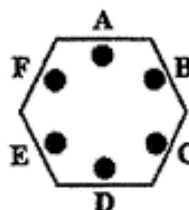
He observed that all the bulbs did not light up.

Which one of the following explains why all the bulbs in Jaycus's circuit did not light up?

- (1) There is no switch in the circuit.
 - (2) There is no battery in the circuit.
 - (3) The metal rod is an electrical insulator.
 - (4) There are too many bulbs in the circuit.
19. The diagram below shows a circuit tester and a circuit board. A, B, C, D, E and F are connecting points of the circuit board. Only three of the points are connected by wires.



Circuit tester



Circuit board

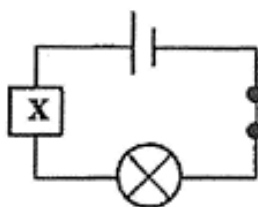
The 2 points, P and Q, of the circuit tester are connected to 2 points on the circuit board and the results are shown in the table below.

Points connected	Does the bulb light up?
A and E	No
B and D	Yes
B and F	Yes
C and E	No

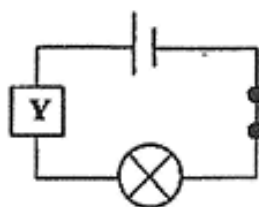
Which 2 points on of the circuit board should be connected to the circuit tester in order for the bulb to light up?

- (1) A and C
- (2) B and C
- (3) B and E
- (4) D and F

20. Materials X and Y were connected to circuits A and B as shown in the diagrams below. The bulb in circuit A lit up but the bulb in circuit B did not light up.



Circuit A

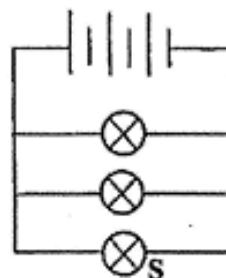
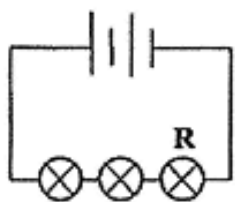
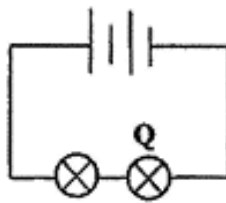
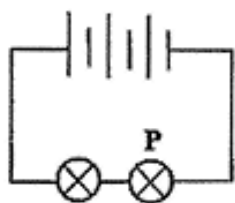


Circuit B

What could materials X and Y be?

	Material X	Material Y
(1)	Iron	Glass
(2)	Plastic	Rubber
(3)	Rubber	Steel
(4)	Steel	Iron

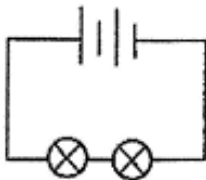
21. Fred set up 4 different circuits as shown in the diagrams below. All the bulbs in each circuit lit up.



Arrange the four bulbs, P, Q, R and S, based on their brightness, starting with the brightest.

	Brightest	→	Dimmest
(1)	P, S,	Q, R	
(2)	Q, S,	P, R	
(3)	R, Q,	P, S	
(4)	S, P,	Q, R	

22. Rahman set up a circuit as shown below.

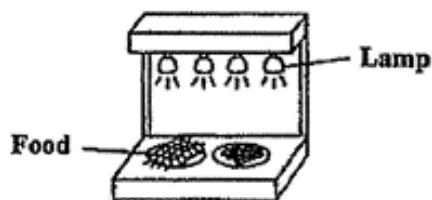


Which of the following can Rahman do to increase the brightness of the bulbs?

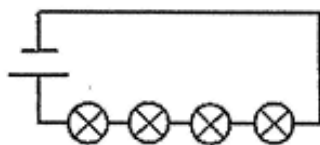
- A: Remove one battery.
- B: Add one more bulb in series.
- C: Add one more battery in series.
- D: Arrange the bulbs in parallel to each other.

- (1) A and B only
- (2) C and D only
- (3) B, C and D only
- (4) A, B, C and D

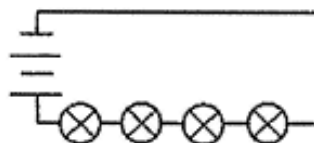
23. The diagram below shows a set-up that uses identical lamps to keep food warm. Vera wants to find out if the arrangement of lamps in a circuit affects the amount of heat given out.



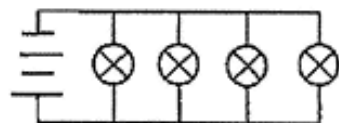
Which two set-ups should she use in her experiment?



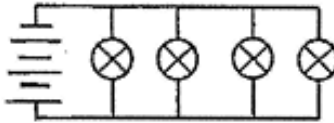
Set-up W



Set-up X



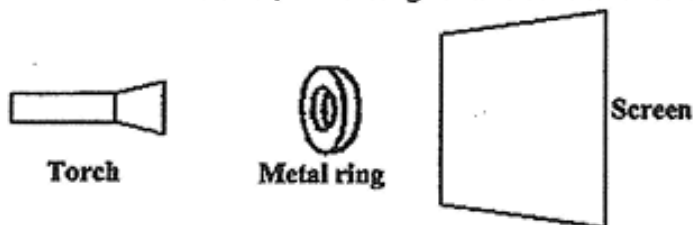
Set-up Y



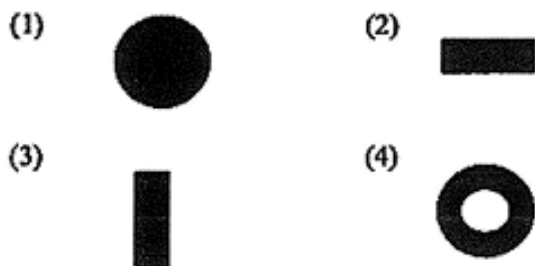
Set-up Z

- (1) W and X
- (2) W and Y
- (3) X and Y
- (4) X and Z

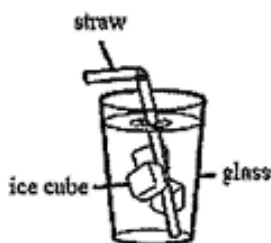
24. The diagram below shows a torch, a metal ring and a screen in a dark room.



The position of the metal ring can be changed. Which shadow cannot be formed on the screen when the torch is switched on?



25. The diagram below shows a glass of iced water.

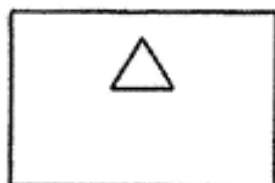


Which of the following statements is/are correct?

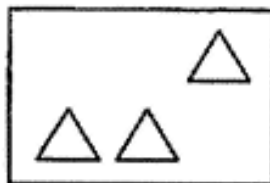
- A: The straw loses heat to the ice cubes.
 B: The ice cubes gain heat from the water.
 C: The glass gains heat from the surrounding.

- (1) A only
 (2) A and B only
 (3) B and C only
 (4) A, B and C

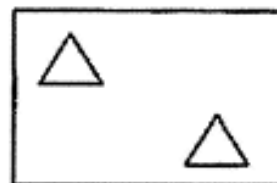
26. Sanjay cut out shapes from three sheets, P, Q and R, as shown below. The sheets were of the same size but made of different materials.



Sheet P

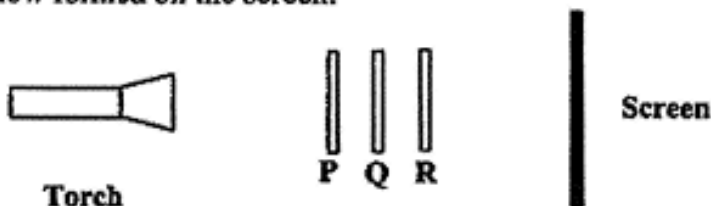


Sheet Q



Sheet R

He arranged the three sheets in a straight line and shone a torch on them to observe the shadow formed on the screen.



The shadow observed on the screen is shown below.



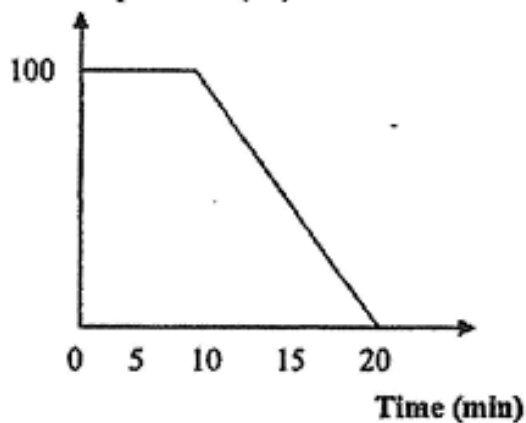
Which one of the following sets correctly identifies the material of each sheet?

	Sheet P	Sheet Q	Sheet R
(1)	Clear glass	Metal	Wood
(2)	Wood	Metal	Clear plastic
(3)	Clear plastic	Wood	Clear glass
(4)	Frosted glass	Clear glass	Clear plastic

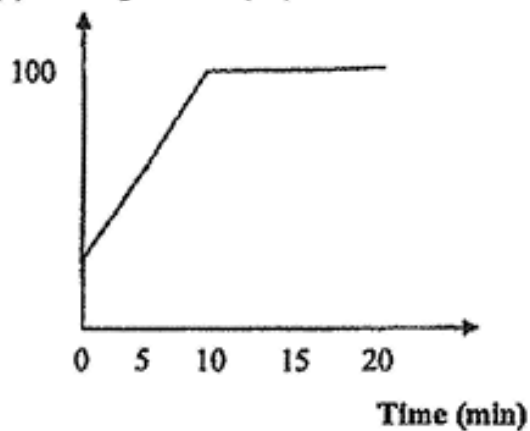
27. Sam heats up a beaker of tap water at room temperature over time.

Which one of the following graphs correctly shows how the temperature of water changes over 20 minutes?

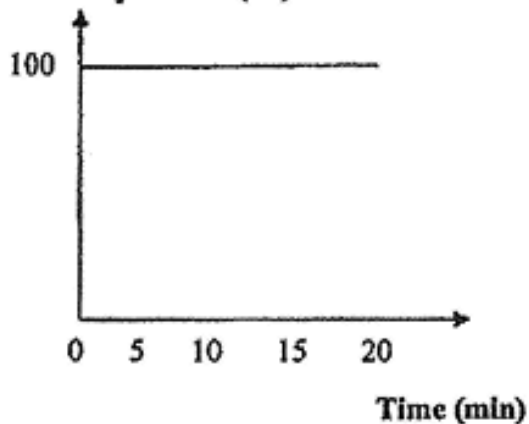
(1) Temperature ($^{\circ}\text{C}$)



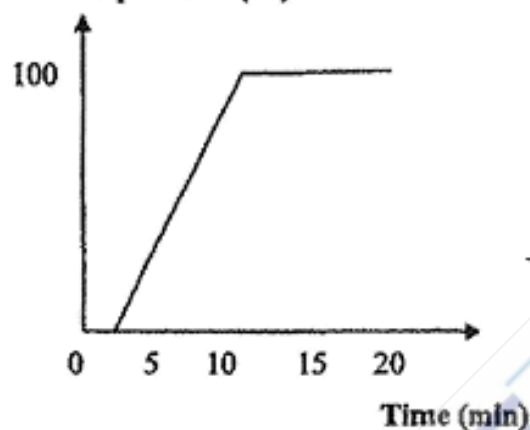
(2) Temperature ($^{\circ}\text{C}$)



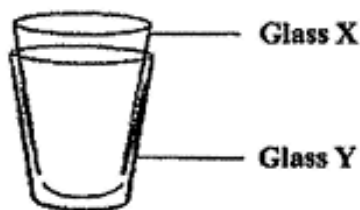
(3) Temperature ($^{\circ}\text{C}$)



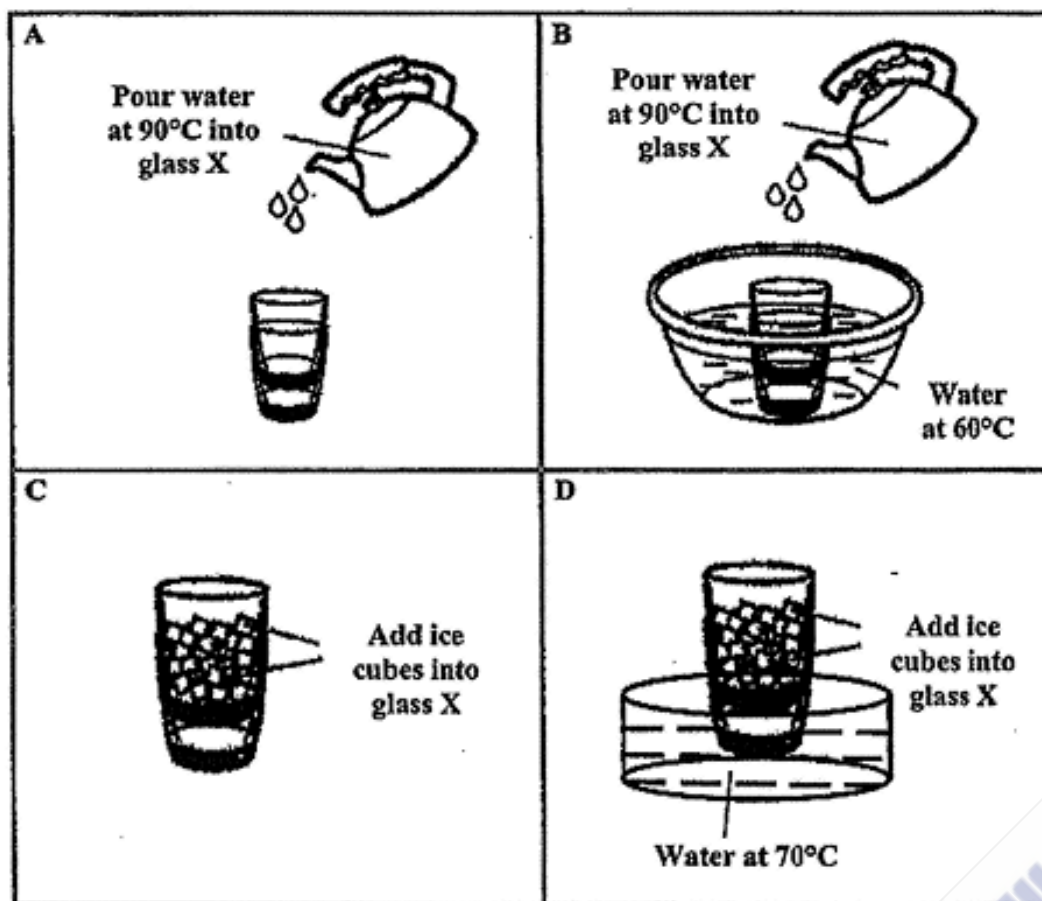
(4) Temperature ($^{\circ}\text{C}$)



28. Justin had two thick glasses, X and Y, at room temperature, stuck together as shown in the diagram below.



Study the diagrams below carefully.



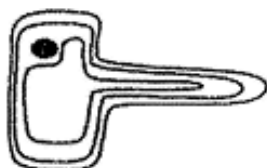
Which of the following method(s) could he use to separate the two glasses without breaking them?

- (1) A only
- (2) C only
- (3) A and B only
- (4) C and D only

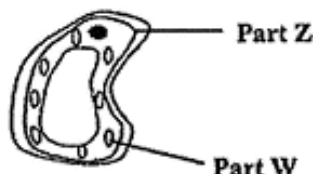
Section B (44 marks)

Write your answers to questions 29 to 40 in this booklet.

29. Jeremy examines two cells, X and Y, and concludes that they are taken from the same plant.



Cell X



Cell Y

- (a) Is Jeremy's conclusion that cells X and Y are taken from the same plant correct? Explain your answer based on the diagrams above. [1]

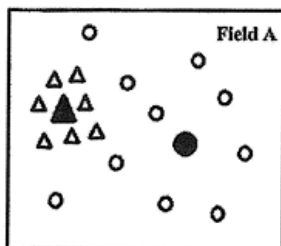
- (b) Write down the name of part W. What does it contain and how does it help the plant? [2]

- (c) How does part Z protect the cell Y from harmful substances outside the cell? [1]





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30. Andy studied the positions of two different types of plants, X and Y, in field A as shown below.



Key:

Plant	X	Y
Adult		
Young		

- (a)(i) Plant Y would grow more healthily than plant X. Explain why this was so based on the diagram above. [2]

The diagrams below show the fruits of plants X and Y.



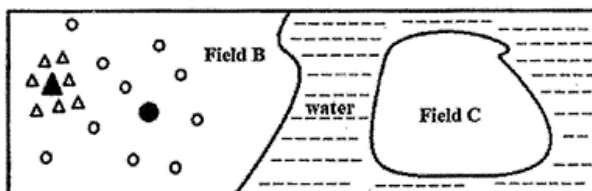
Fruit P



Fruit Q

- (a)(ii) Which fruit, P or Q, is the fruit of plant X? Explain your answer. [1]

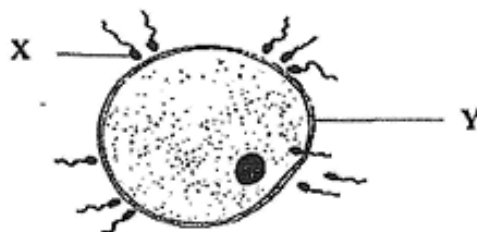
- (b) There were two fields, B and C, as shown below. At the beginning, field B had plants and animals, but field C had no plants and no animals.



A few years later, field C started to have plants.

Describe two ways through which field C started to have plants. [2]

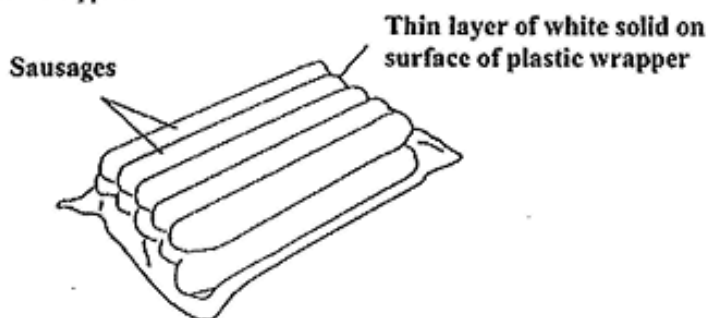
31. The diagram below shows a process that takes place in a female human body.



- (a) State and describe the process shown in the diagram above. [2]

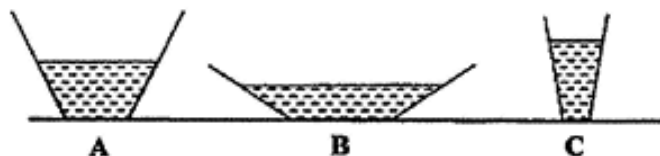
- (b) Explain why there is a need to have many cell X. [1]

32. A packet of sausages wrapped in clear plastic was taken out from the freezer and placed on the dining table. After a while, a thin layer of white solid was formed on the surface of the plastic wrapper.



- Explain how the white solid was formed. [2]

33. Joanna filled three containers, A, B and C, with the same amount of tap water and left them in the same location.



She measured and recorded the amount of water left in each container after one day in the table below.

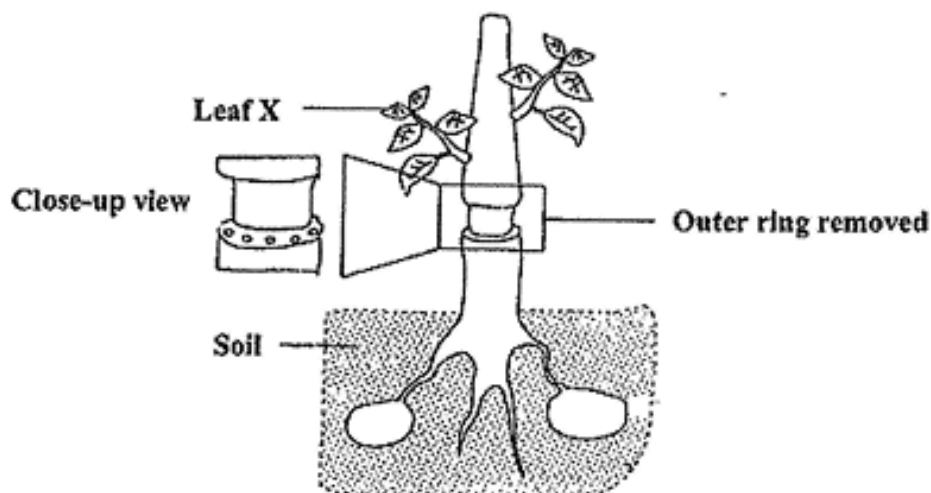
Container	Volume of water in the container (cm ³)	
	Start of experiment	After one day
A	60	38
B	60	20
C	60	45

- (a) Based on the results, what can be concluded about the exposed surface area of the water in the container and the rate of evaporation of the water? [1]

- (b) Explain why placing all three containers at the same location would help ensure a fair test. [1]

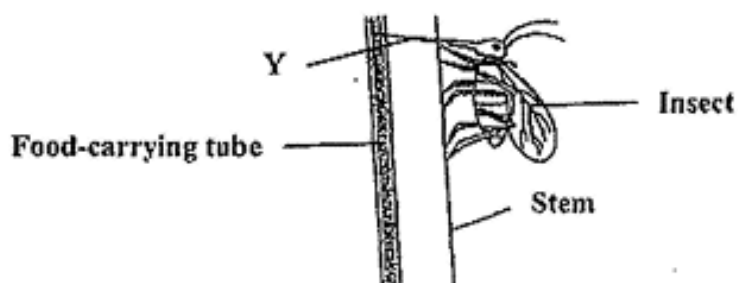
- (c) Joanna conducted another experiment and filled container A with 60cm³ of hot water. The amount of water left in container A after one day was less than 38cm³. Explain why it was so. [1]

34. The diagram below shows the stem of a plant with an outer ring removed.



- (a) It was observed that leaf X continued to grow bigger after two weeks. Explain why this happened. [2]

An insect uses part Y to poke into the food-carrying tube of a stem.



- (b) Explain how the roots of the plant could be affected after some time. [2]

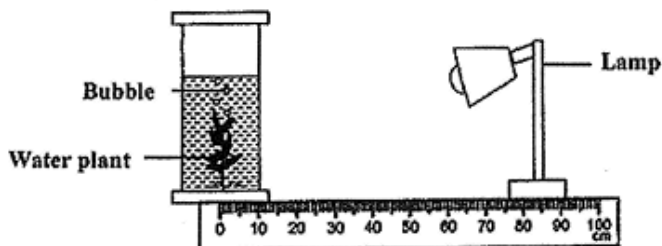
35. The respiratory system plays an important role in humans.

(a) Name the three main parts that make up the human respiratory system. [1]

(b) Explain why the breathing rate of a person increases when he / she is running. [1]

(c) The respiratory system works with the circulatory system to remove a gas when we breathe out. Name the gas. [1]

36. Plants produce a gas when light is present. Michael set up an experiment, as shown below, to find out if the amount of light affects the amount of gas produced.



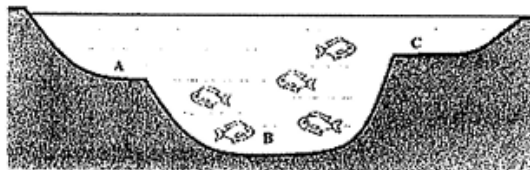
He placed a lamp at various distances and recorded the number of bubbles produced in one minute by the water plant. The results are shown in the table below.

Distance between the lamp and the water plant (cm)	20	40	60	80
Number of bubbles produced in one minute	25	17	8	3

- (a) Based on Michael's results, what is the relationship between the number of bubbles produced and the distance between the lamp and the water plant? [1]

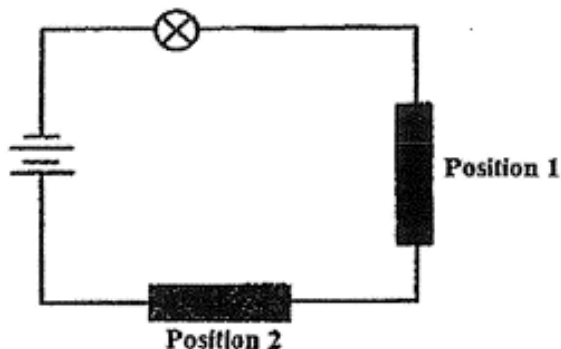
- (b) Michael conducted the experiment in a dark room. Give a reason why this would have made the results more accurate. [1]

- (c) Michael found out later that the gas produced by the plant is oxygen when light is present. That gave him an idea of planting water plants in his pond as shown below.



Based on the results of the experiment, Michael decided that he should avoid planting his water plants in the pond at B. Explain Michael's decision so that more fish would survive. [1]

37. Stephen wanted to find out if bars P, Q, R, S and T are electrical conductors. He set up the circuit as shown below.



He placed the bars at positions 1 and 2 and recorded his observations in the table below.

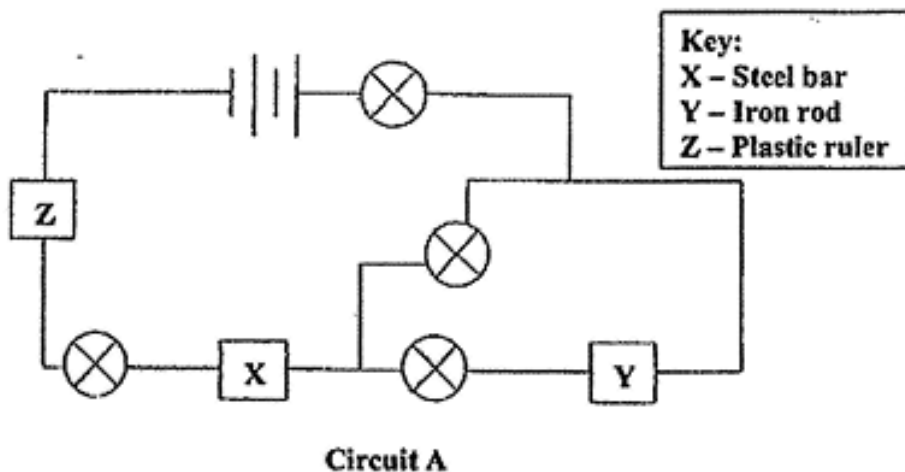
Position 1	Position 2	Did the bulb light up?
P	Q	Yes
R	S	No
P	R	Yes
Q	T	No

- (a) Define an electrical conductor. [1]

- (b) Complete the table below with P, Q, R, S and T in the correct column. [2]

Electrical conductor(s)	Electrical insulator(s)

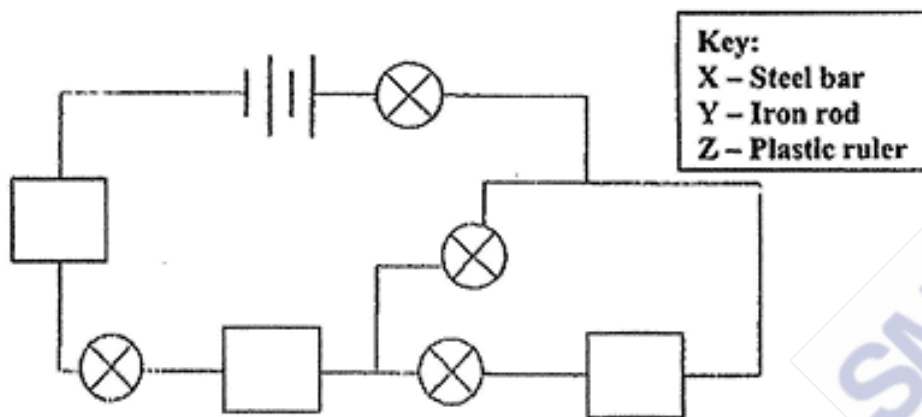
- (c) Stephen set up another circuit A and connected objects X, Y and Z to the circuit as shown below. All the bulbs and batteries were in working condition.



- (i) He observed that none of the bulbs in circuit A lit up. Explain why this was so. [1]

- (ii) At which positions in the circuit below should Stephen place objects X, Y and Z so that the most number of bulbs would be lit up?

Write X, Y or Z in each of the boxes provided below. Use each letter once only. [1]



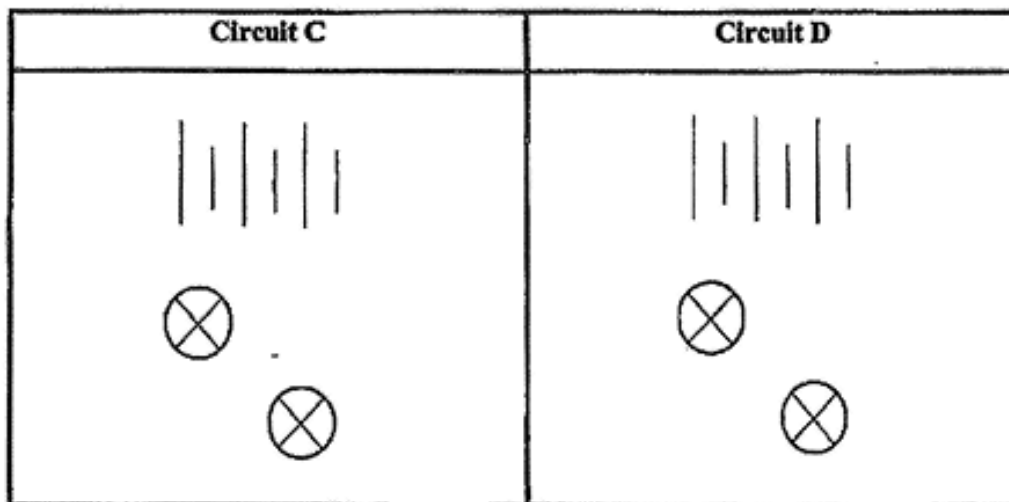
38. Noah conducted an experiment using 2 identical bulbs and 3 batteries. He set up two different circuits, C and D, and arranged the bulbs either in series or parallel. He recorded his results in the table below.

Number of bulbs in circuit	Brightness of each bulb in circuit C (units)	Brightness of each bulb in circuit D (units)
2	3	6

Next, he conducted another experiment using 3 identical bulbs and 3 batteries. Using the same bulb arrangement in the first experiment, he recorded his results in the table below.

Number of bulbs in circuit	Brightness of each bulb in circuit C (units)	Brightness of each bulb in circuit D (units)
3	2	6

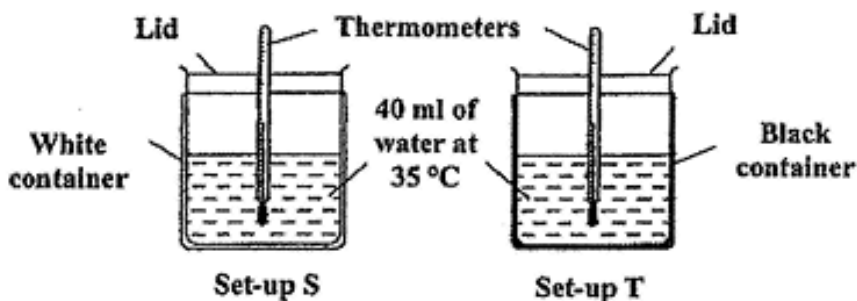
- (a) Using 2 bulbs and 3 batteries for each circuit, complete the circuit diagram in each of the boxes below to show how the bulbs in circuits C and D are arranged in the first experiment. [2]



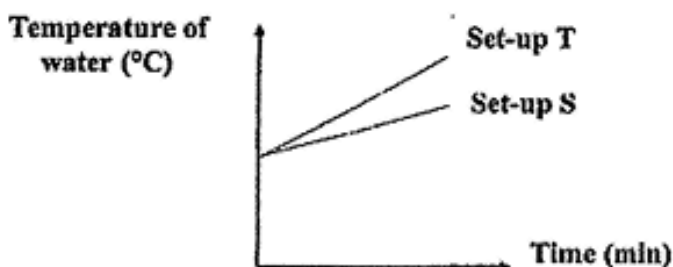
- (b) A bulb is removed from circuit C in the diagram above. What would happen to the brightness of the other bulb when the wires are connected again? [1]

- (c) State an advantage of circuit D as compared to circuit C. [1]

39. Insyirah wanted to find out whether the different colours of 2 containers will affect the rate at which water in the containers gains heat. She prepared two set-ups, S and T, as shown below, using 2 containers of different colours and placed them outside under the Sun for two hours.



The results are shown in the graph below.



- (a) Based on the graphs above, what could Insyirah conclude about her experiment? [1]

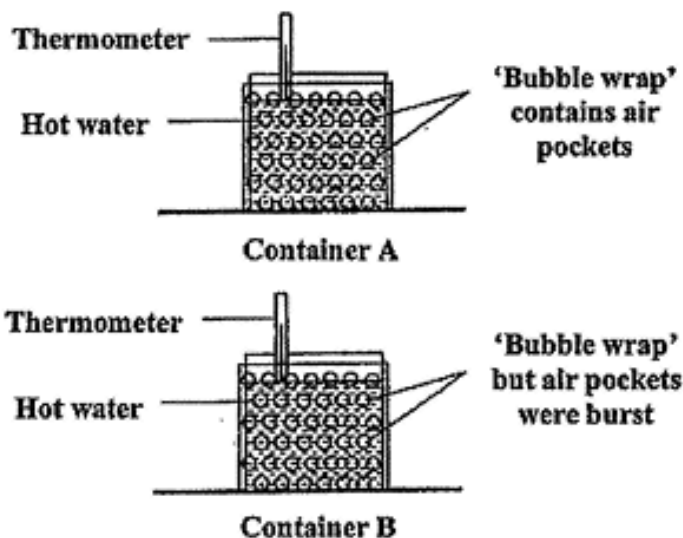
- (b) Insyirah observed more tiny water droplets forming on the underside of the lid of the black container than the white one after some time.

Based on the graphs above, explain your answer.

[2]

40. Gopal conducted an experiment to investigate how 'bubble wrap' affects the temperature of water. He used two identical containers as shown below.

Container A was covered with "bubble wrap" that contains air pockets while container B was covered with "bubble wrap" but the air pockets were burst and the wrap did not have air in the pockets. Both containers were filled with hot water.

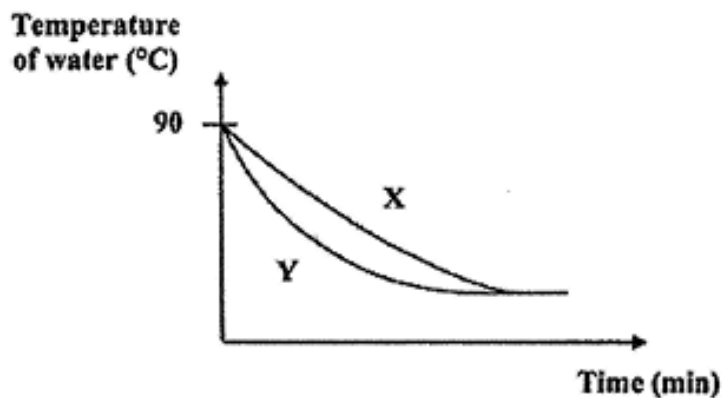


- (a) What are the variables that must remain the same for a fair test?

[1]

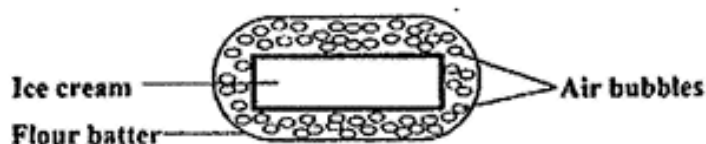
Variables	Tick (✓) the variables to remain the same
Amount of water	
Temperature of water	
Size of containers	

- (b) Gopal recorded the temperature of water in containers A and B over time in the graph shown below.



Based on the graph above, explain why line Y represents the change of temperature of water in container B. [2]

- (c) A restaurant prepares fried ice cream to sell as desserts as shown below. A slab of ice cream is covered with flour batter that is whipped to create air bubbles. The ice cream is then fried in hot oil where the batter is cooked.



Explain why the ice cream does not melt easily while it is being fried in hot oil. [2]

END OF PAPER

ANSWER SHEET

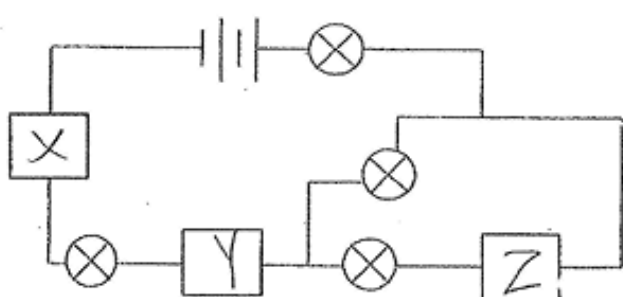
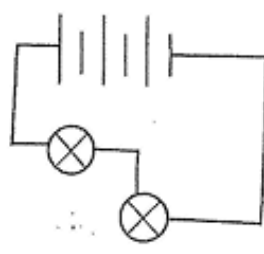
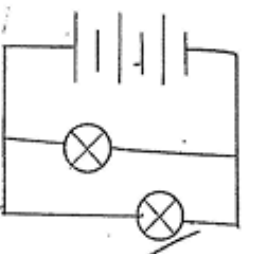
SECTION A

Q 1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
3	4	2	3	1	2	4	1	1	3
Q 11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
3	1	3	2	4	3	4	2	4	1
Q 21	Q22	Q23	Q24	Q25	Q26	Q27	Q28		
4	2	3	1	4	3	2	4		

SECTION B

Q29)	<p>a) Yes, Jeremy's conclusion is correct. Both cell are plant cell and cell X is a root cell while cell Y is a leaf cell.</p> <p>b) Chloroplast. Chloroplast contain chlorophyll which helps to trap sunlight and make food for the plant.</p> <p>c) Part Z controls the movement in and out of the cell which prevent harmful substances from entering the cell.</p>
Q30)	<p>a) i) Plant Y's young are scattered further away, while plant X's young are scattered altogether causing them to fight for water and sunlight.</p> <p>ii) Fruit Q. Fruit Q's dispersing method is by splitting and plant X's young are near, thus it is fruit Q.</p> <p>b) Plants that disperse by water's seeding must have ended up there and plant Y's young must have grown up and the wind dispersed its seeds there.</p>

Q31)	<p>a) Fertilisation. Fertilisation happens when a sperm fuses with the egg making a fetus.</p> <p>b) During the process a lot of cell X would die to increase the chances of fertilising the egg there are many cell X.</p>		
Q32)	<p>The warmer water vapour from the surrounding corners into contact with the cooler surface of the plastic and condenses. The water droplets froze.</p>		
Q33)	<p>a) The bigger the exposed surface area is the rate of evaporation will be faster.</p> <p>b) If the temperature increases the rate of evaporation will increase to, to prevent that the three container were placed at the same place.</p> <p>c) The rate of evaporation increases when the temperature of water increases as water's boiling point is 100°C.</p>		
Q34)	<p>a) As the water-carrying tubes are present water is transported to leaf X to make food.</p> <p>b) The roots would not be able to receive the food, so the roots would die.</p>		
Q35)	<p>a) Nose, lungs and windpipe.</p> <p>b) A person requires more oxygen when running as more systems are working together.</p> <p>c) Carbon-dioxide</p>		
Q36)	<p>a) The number of bubbles produced decreased as the distance increase.</p> <p>b) There would not be an external source of light which would affect the results of the test.</p> <p>c) The least amount of light would reach Part B. The plants would produce the least amount of oxygen and the fish might die.</p>		
Q37)	<p>a) An electrical conductor allows electrical currents to flow through.</p> <p>b)</p> <table border="1"> <tr> <td>P, Q, R</td> <td>S, T</td> </tr> </table> <p>c) i) Z which was an electrical insulator was not letting the electrical current flow through, thus no bulbs lights up.</p>	P, Q, R	S, T
P, Q, R	S, T		

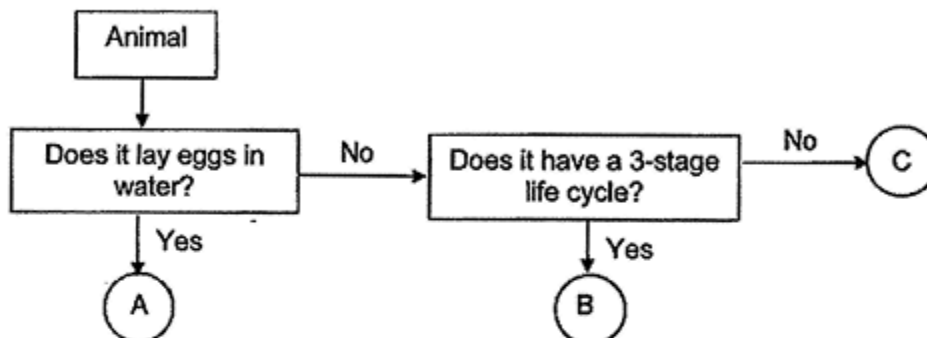
	<p>ii)</p> 			
Q38)	<p>a)</p> <div style="display: flex; justify-content: space-around;"><div style="border: 1px solid black; padding: 5px; width: 45%;"><p style="text-align: center; margin: 0;">Circuit C</p></div><div style="border: 1px solid black; padding: 5px; width: 45%;"><p style="text-align: center; margin: 0;">Circuit D</p></div></div> <p>b) The brightness of the other bulb would increase.</p> <p>c) If one bulb fuses the other bulb would still be able to work.</p>			
Q39)	<p>a) The black container gains heat faster than the white container.</p> <p>b) The water evaporated into water vapour faster. Thus, more water vapour condensed into water droplets.</p>			
Q40)	<p>a)</p> <table border="1" style="margin-left: auto; margin-right: auto;"><tr><td style="text-align: center;">✓</td></tr><tr><td style="text-align: center;">✓</td></tr><tr><td style="text-align: center;">✓</td></tr></table> <p>b) Graph Y shows that the temperature of water decrease faster than graph X. The bubbles wrap did not have air pockets and heat was lost faster.</p> <p>c) The air in the bubbles is poor conductor of heat. Thus, the heat from the oil is lost slowly to the ice cream.</p>	✓	✓	✓
✓				
✓				
✓				

SINGAPORE CHINESE GIRLS' SCHOOL SA2 PAPER

Booklet A (56 marks)

For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). **Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet.**

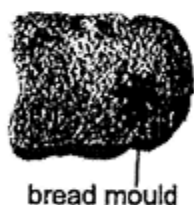
1. Study the chart below.



Based on the information above, which of the following correctly represents animals A, B and C?

	A	B	C
1)	frog	grasshopper	butterfly
2)	frog	butterfly	grasshopper
3)	mealworm	butterfly	grasshopper
4)	mealworm	grasshopper	butterfly

2. Study the diagram below.



The following statements were made by Sam, Ted and Uma.

Sam : Both of them reproduce by spores.

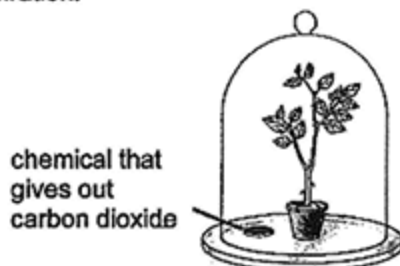
Ted : Mushroom can make its own food, but the bread mould cannot.

Uma : All mushrooms and bread mould are poisonous.

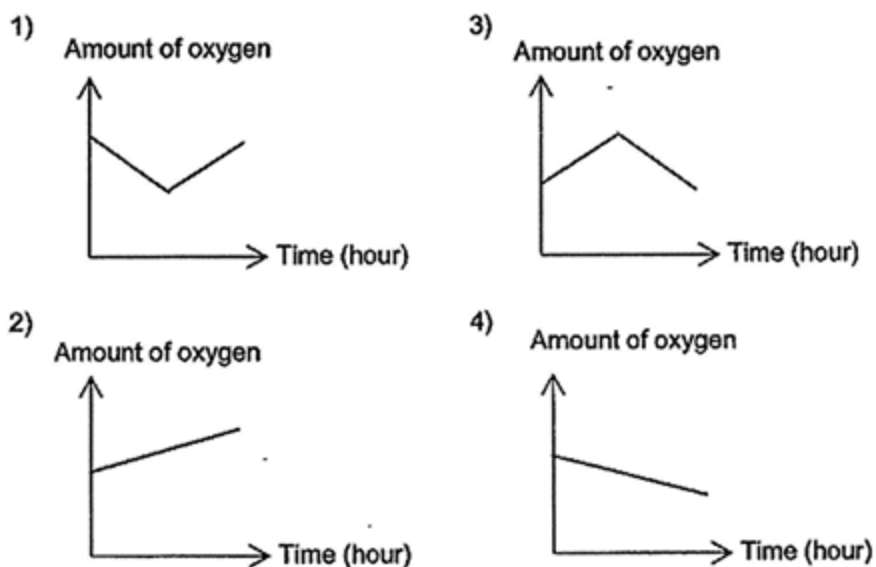
Who is/are correct ?

- | | |
|-------------|---------------------|
| 1) Sam only | 3) Sam and Uma only |
| 2) Ted only | 4) Ted and Uma only |

3. A bell jar made of clear glass is placed over a healthy plant. The set-up is placed under bright light in a room for several hours. The rate of photosynthesis is higher than the rate of respiration.



Which of the following graphs correctly shows the amount of oxygen in the set-up over an hour?



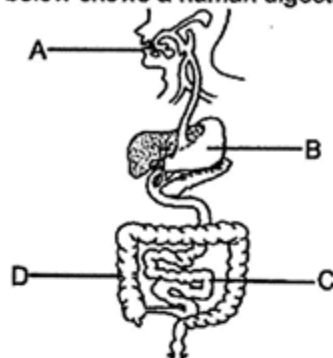
4. Caryn wants to find out the conditions necessary for mealworms to survive. An equal number of mealworms were put into the four tanks A, B, C and D. A tick (✓) shows that the condition is present.

Tanks	Temperature of surroundings	Conditions		
		Light	Water	Air
A	40°C		✓	✓
B	30°C	✓	✓	✓
C	40°C		✓	✓
D	30°C	✓		✓

Based on the table above, Caryn aims to find out if _____ is needed for mealworms to survive.

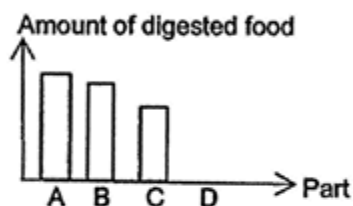
- 1) light
2) air
3) water
4) warmth

5. The diagram below shows a human digestive system.

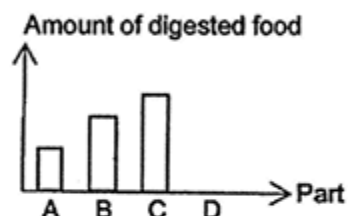


Which bar graph below shows the correct amount of digested food leaving the parts A, B, C and D?

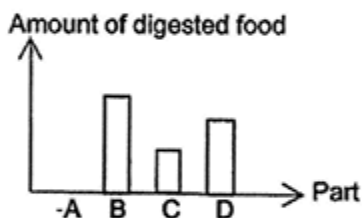
1)



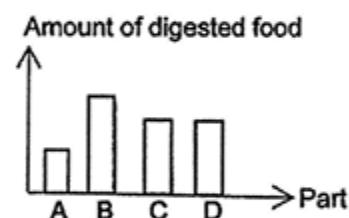
3)



2)



4)

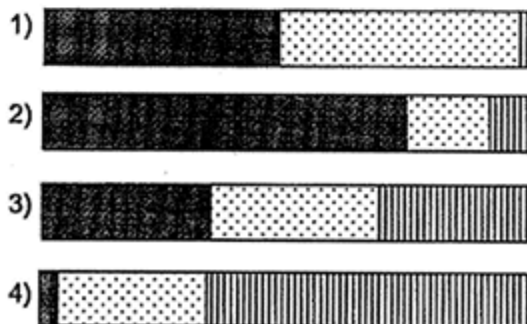


6. Some adults and children were trapped in a faulty lift where air could not enter or escape. The graph below shows the composition of air in the lift. Which of the following best represents the composition of air after an hour?

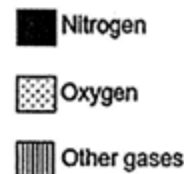
At the start



After an hour



Legend



7. P, Q, R and S are all beetle M at different stages of Beetle M's life cycle. They were each separately kept in containers with 20 g of food inside. After two days, the mass of the food was weighed and recorded in the table below.

Beetle M	Mass of food left after two days
P	10 g
Q	5 g
R	8 g
S	20 g

Which of the following, P, Q, R or S, is most likely to be beetle M in the pupa stage?

- | | |
|------|------|
| 1) P | 3) R |
| 2) Q | 4) S |

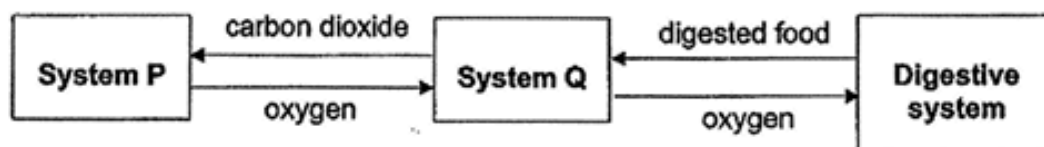
8. The diagram below shows part X of a plant.



Which processes must have taken place for the development of part X from a flower?

- | | |
|-----------------------------------|--|
| 1) pollination and fertilisation | |
| 2) germination and pollination | |
| 3) fertilisation and germination | |
| 4) seed dispersal and germination | |
9. Which of the following statements about human reproduction are true?
- A : Sperm cells are produced in large numbers by the ovary.
 B : One egg is fertilised by many sperms.
 C : The fertilised egg will develop in the stomach.
 D : Two sex cells are needed to produce an offspring.
- | | |
|-----------|--------------------|
| 1) B only | 3) B, C and D only |
| 2) D only | 4) A, B and D only |

10. The diagram shows how three human body systems work together.



Which of the following statements is/are true about System P and System Q?

- A) System P carries out gaseous exchange.
- B) The windpipe in System P allows the air to travel from nose to lungs.
- C) System Q contains heart, blood vessels and lungs.
- D) System Q carries only oxygen and digested food to all parts of the body.

- 1) A only
- 2) B only
- 3) A and B only
- 4) All of the above

11. Which of the following shows the correct order in which carbon dioxide is removed from the leg in the human body?

- 1) Bloodstream → Heart → Lungs → Windpipe → Nose
- 2) Bloodstream → Lungs → Heart → Windpipe → Nose
- 3) Nose → Windpipe → Lungs → Heart → Bloodstream
- 4) Nose → Lungs → Windpipe → Bloodstream → Heart

12. The table shows a comparison of an animal cell and a leaf cell.

	Muscle cell	Leaf cell
A)	It has cell wall that gives it a shape	It does not have a cell wall
B)	It contains genetic information in the nucleus	It contains genetic information in the nucleus
C)	It has cytoplasm	It does not have cytoplasm
D)	It does not have chloroplasts	It has chloroplasts

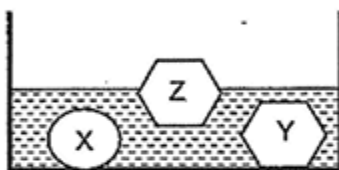
Which of the above comparisons is/are true?

- 1) A only
- 2) B and C only
- 3) B and D only
- 4) D only

13. Animal F lives in cold countries. It has a thick layer of black fur on its body which humans make into winter coats. Which of the following explains why humans use animal F's fur to make into winter coats?

- 1) The fur helps the person to gain more heat from the surroundings.
- 2) The fur helps the person lose less heat to the surroundings.
- 3) The fur absorbs heat faster from the human body.
- 4) The fur loses more heat to the human body.

14. Sally placed three objects X, Y and Z into a tank of water.



She made the following statements.

A : X and Y have the same mass.

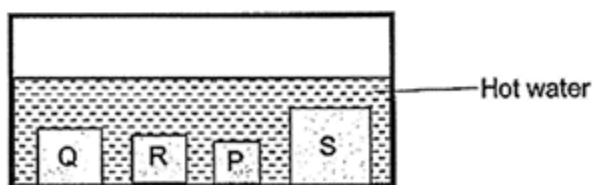
B : X and Y are made of the same material.

C : Y and Z are made of different materials.

Which of the following statement(s) is/are definitely true?

- | | |
|-----------|-----------------|
| 1) A only | 3) A and B only |
| 2) C only | 4) B and C only |

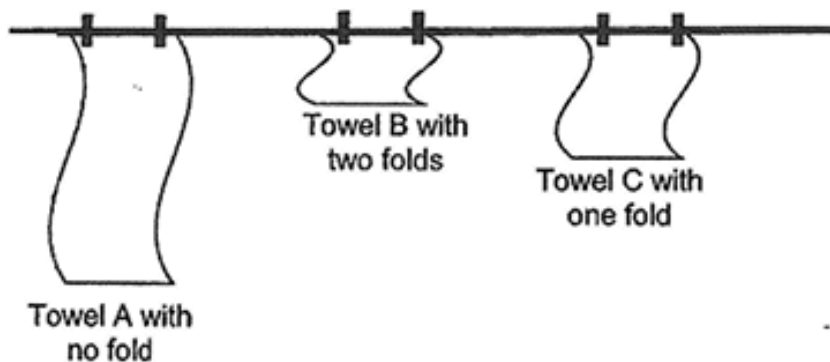
15. Four metal cubes, P, Q, R and S, of the same temperature, were lowered into a basin of hot water. The metal cubes are made of the same material but different volume.



Which cube will take the longest time to reach the same temperature as the hot water?

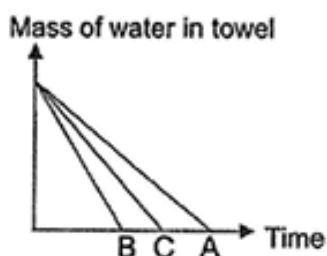
- | | |
|------|------|
| 1) P | 3) R |
| 2) Q | 4) S |

19. Three identical towels A, B and C with the same amount of water were left to dry under the sun. Each towel was folded to expose a different amount of surface area as shown below. The three towels were weighed at regular intervals until all of them were completely dry. The results were recorded in a graph.

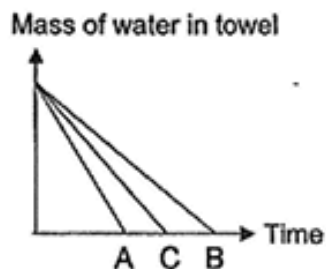


Which graph represents the results correctly?

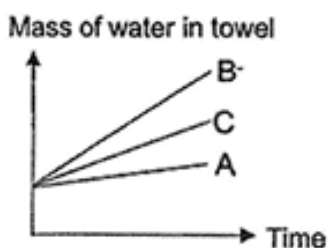
1)



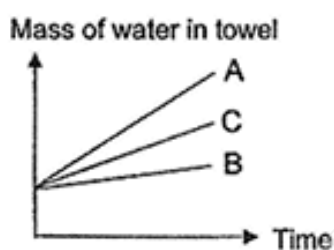
3)



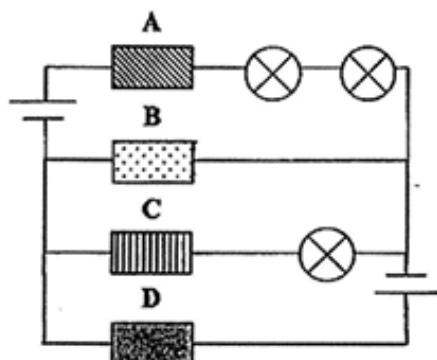
2)



4)



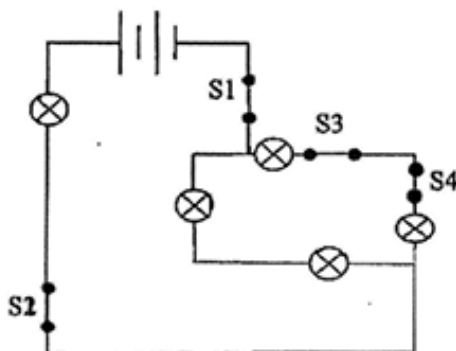
20. Rina wanted to find out whether four materials A, B, C and D were electrical conductors or insulators using the electrical circuit shown below.



It is observed that all the three bulbs lit up.
Which of the following about A, B, C and D is correct?

	A	B	C	D
1)	conductor	insulator	insulator	insulator
2)	insulator	conductor	conductor	insulator
3)	conductor	insulator	conductor	conductor
4)	insulator	conductor	insulator	conductor

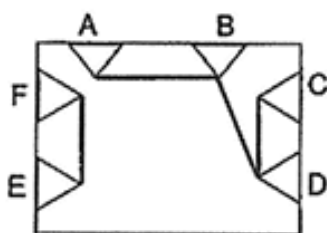
21. Five bulbs are connected in an electrical circuit as shown below.



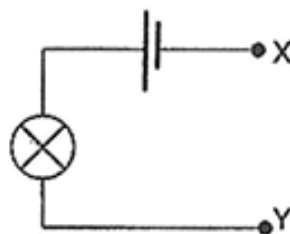
Which of the following is the correct observation when selected switches are closed?

	Switches that are closed	Number of bulbs light up
1)	S1 only	1
2)	S1 and S2 only	3
3)	S1, S3 and S4 only	3
4)	S2, S3 and S4 only	5

22. A circuit card with clips A, B, C, D, E and F are connected to X and Y of a circuit tester as shown below.



Circuit Card



Circuit Tester

Which of the following shows the correct observations when the following combination of clips are connected to the circuit tester?

	A and C	B and F	D and E
1)	Lights up	Does not light up	Lights up
2)	Does not light up	Lights up	Lights up
3)	Lights up	Does not light up	Does not light up
4)	Does not light up	Lights up	Does not light up

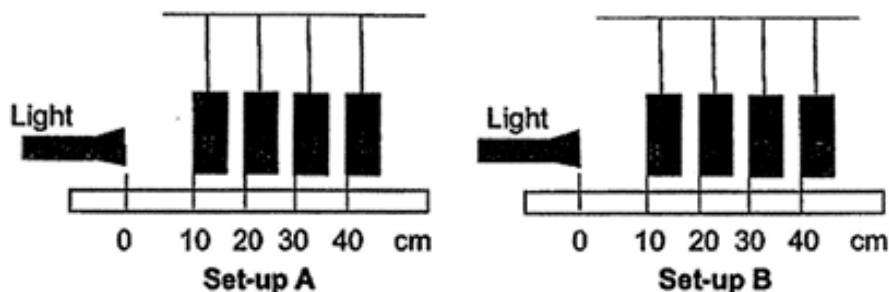
23. The object below is placed between a torch and a screen in different positions.



Which of the following **cannot** be a shadow of this object?



24. An experiment was conducted in a dark room. Light was shone through P, Q, R and S which were made of different materials that had the same thickness.



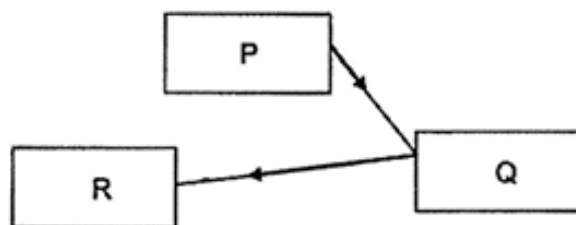
The distance travelled by the light before it was fully blocked was measured and recorded below.

Set-up	Distance travelled by light before it was blocked
A	40 cm
B	20 cm

Which one of the following correctly describes the property of sheets P, Q, R and S?

	Does it allow light to pass through?			
	P	Q	R	S
1)	Yes	Yes	Yes	Not possible to tell
2)	No	Yes	No	Not possible to tell
3)	Yes	Yes	Yes	No
4)	Yes	No	Yes	No

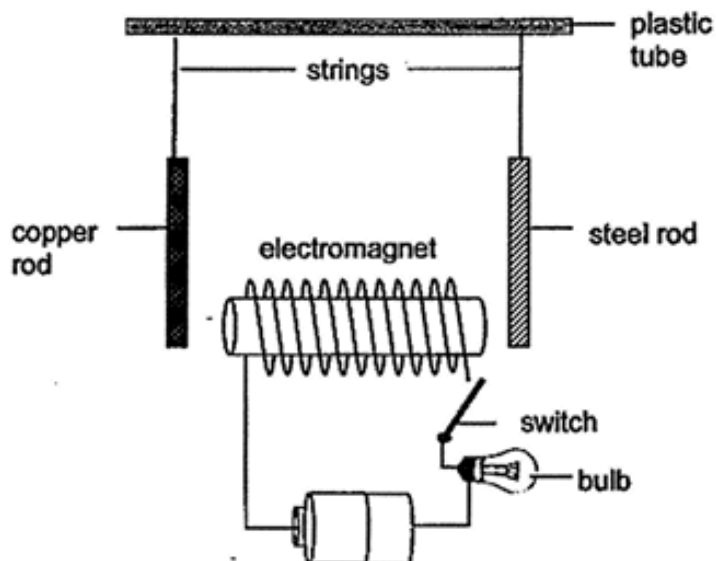
25. The arrows indicate how light travels so that Joan could see her friend in the classroom.



Based on the diagram above, what do P, Q and R represent?

	P	Q	R
1)	friend	Joan	light source
2)	Joan	friend	light source
3)	light source	Joan	friend
4)	light source	friend	Joan

28. Jenny set up an electromagnet and places it between a copper rod and a steel rod as shown below.



What is she likely to observe when she closes the switch?

	Bulb	Copper rod	Steel rod
(1)	lights up	moves away from electromagnet	remains still
(2)	does not light up	move towards electromagnet	moves towards electromagnet
(3)	does not light up	remains still	moves towards electromagnet
(4)	lights up	remain still	moves towards electromagnet

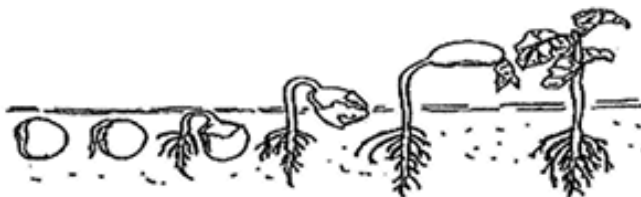
End of Booklet A

Booklet B (44 marks)

For questions 29 to 39, write your answers in this booklet.

The number of marks available is shown in brackets [] at the end of each question or part question.

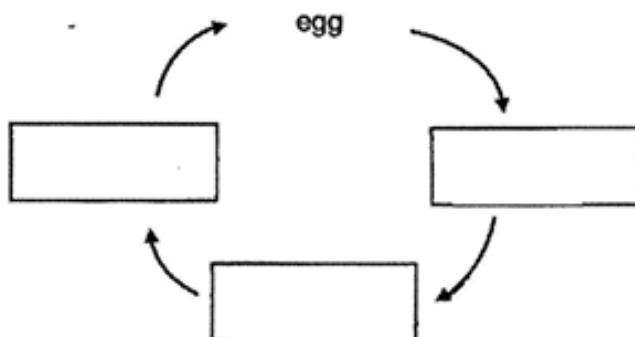
29. (a) The diagram below shows the germination of a seed and its growth into a seedling.



- (i) Explain why the roots of the seedling grow first. [1]

- (ii) Name the part of the seedling that provides food for growth before the true leaves develop to make food. [1]

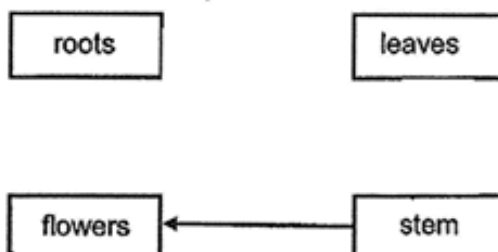
- (b) (i) Complete the diagram below to show the life cycle of a butterfly. [1]



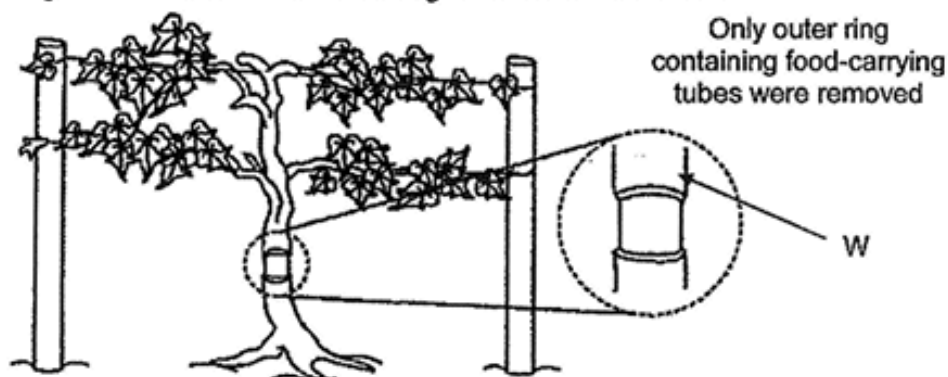
- (ii) Explain how the adult butterfly can be useful to the flowering plants. [1]

30. (a) The diagram below shows four parts of a flowering plant.

Complete the diagram by drawing two arrows to show the direction which water is transported in a plant. The first arrow has been drawn for you. [1]



(b) The gardener removed the outer ring of the stem of the tree.



He measured and recorded the width of the stem at W.

(i) What would happen to the width of the stem at W on Day 3? Circle your answer below. [1]

Increase

Remain the same

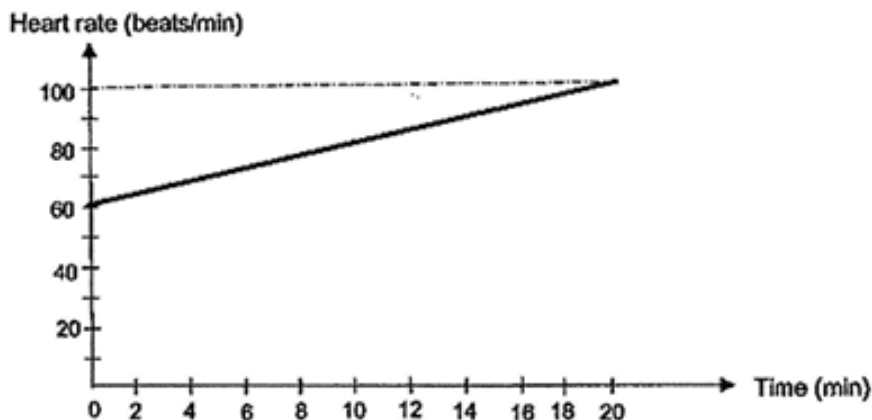
Decrease

(ii) Explain the change in the width of the stem from Day 1 to Day 3. [1]

(iii) Explain why the roots died after a month. [1]

(iv) What would happen to the leaves after another month? Explain. [1]

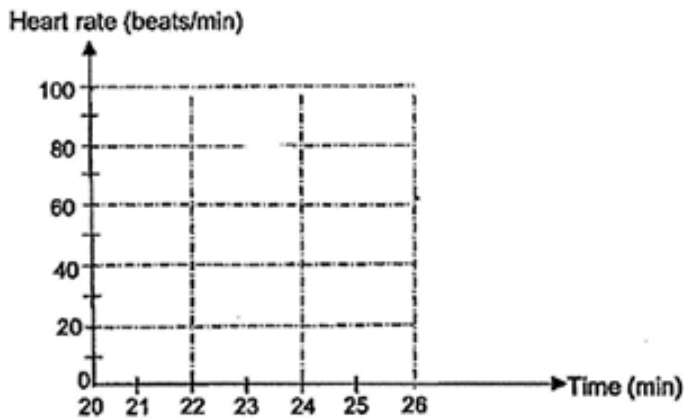
31. Jolene is exercising at the fitness corner. The graph below shows how Jolene's heart rate changes over time during the 20 minutes of exercise.



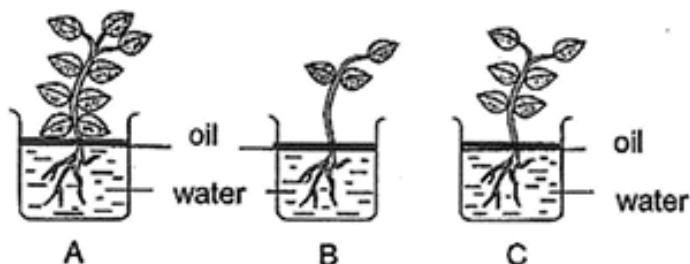
- (a) Based on the graph above, what is the relationship between the time taken for Jolene's exercise and her heart rate? [1]

- (b) Describe how the oxygen from the surrounding air enters Jolene's body and eventually reach her legs. [2]

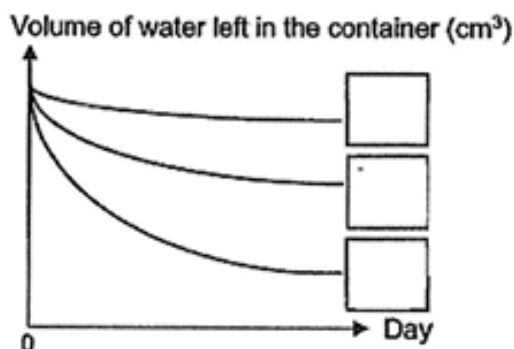
- (c) Jolene stopped exercising at the 20th minute and her heart rate was 100 beats/min. In the graph below, draw a line graph to show the changes in Jolene's heart rate for the next six minutes after she stopped exercising. [1]



32. Angeline conducted an experiment as shown below. Equal amounts of water and oil were added into each of the containers, A, B and C. The set-ups were placed next to the window.



The amount of water left in all the three containers were recorded daily over a period of one week. The results were plotted in the graph as shown below.

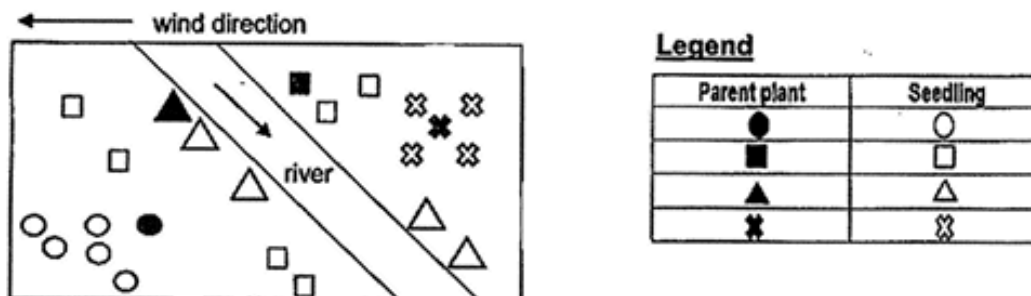


- (a) On the graph above, identify the graph for set-ups A, B and C by labelling the lines A, B and C respectively in the boxes provided. [1]

- (b) Explain your answer for Set-up A in (a). [2]

- (c) Explain how placing all the set-ups at the same place make the experiment a fair test. [1]

33. (a) A field study was conducted on the seed dispersal of different plants. The distribution of seeds by the plants were recorded as shown in the diagram below.



State the possible method of seed dispersal of the following plants.

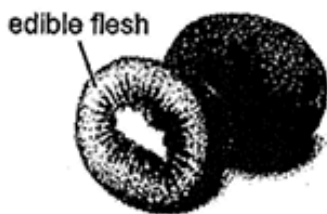
[1]

Parent plant	Dispersal method
(i) ▲	
(ii) ●	

- (iii) Give a reason for your answer in (a) (i) ▲.

[1]

- (b) The diagrams below show two fruits E and F.



Fruit E



Fruit F

- (i) State one similarity of seed dispersal for fruits E and F.

[1]

- (ii) Describe how fruit F is dispersed.

[1]

34. (a) State two substances produced during photosynthesis.

[1]

(b) Xiao Ting took two green leaves, X and Y, from the same plant. She coated one side of each leaf with thick layer of paint immediately as stated in the table below.

Leaf	Coated with paint
X	top
Y	bottom

The leaves were soaked in separate beakers filled with water.



Leaf X in beaker



Leaf Y in beaker

The set-ups were then brought under the sun.

(i) Which beaker, with Leaf X or Leaf Y, would Xiao Ting observe more air bubbles after a while? Give a reason for her observation.

[2]

(ii) Which of the following variables should Xiao Ting keep the same to ensure a fair test? Tick (✓) the appropriate boxes.

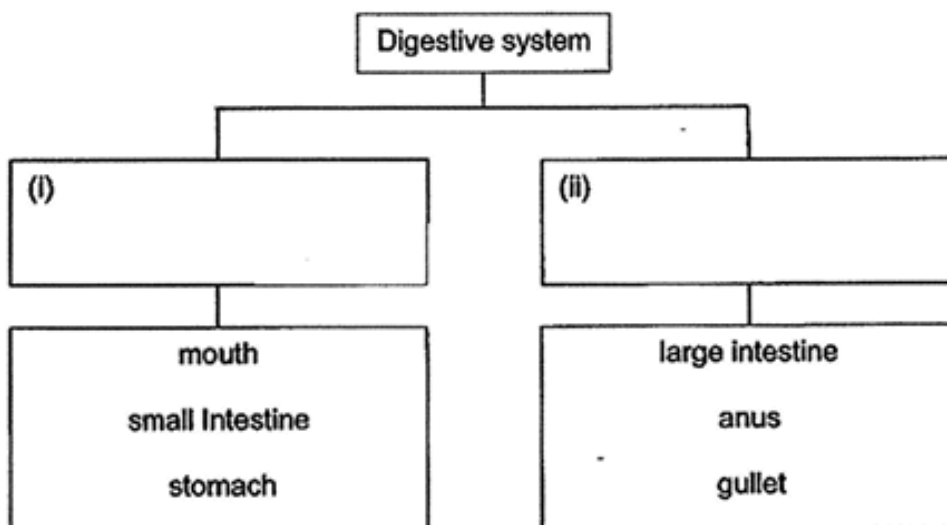
[1]

Variable	Tick (✓) if correct
Size of leaf	
Amount of air bubbles	
Type of leaf	
Surface area of leaf	
Volume of water	

35. The parts in the human digestive system can be classified as shown.

(a) Complete the table by giving suitable headings.

[1]



(b) Name the digestive juice found in the mouth.

[1]

(c) Susan has two similar biscuits A and B. They are soaked in digestive juices. Susan finds that biscuit B digested first.



biscuit A



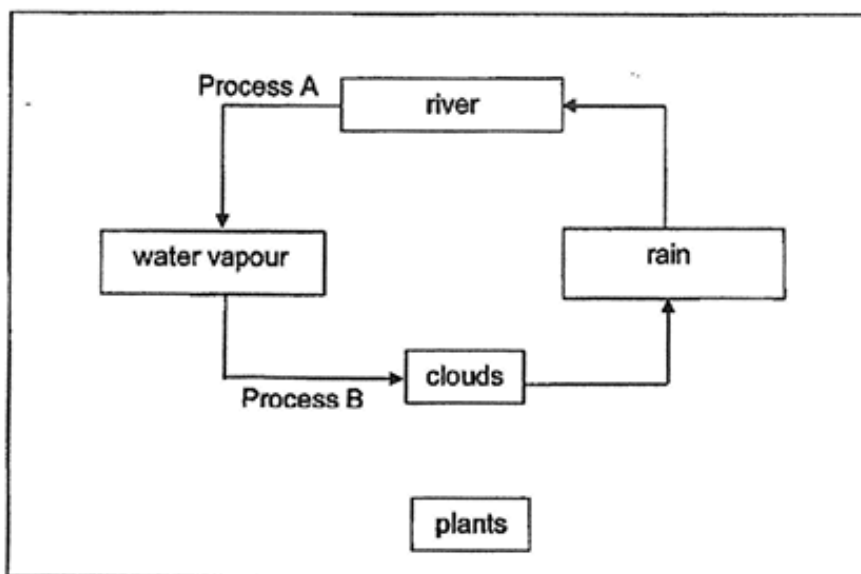
biscuit B

Based on Susan's observation, explain how our teeth helps to speed up the digestion of food.

[2]

36. (a) The diagram below shows a water cycle.

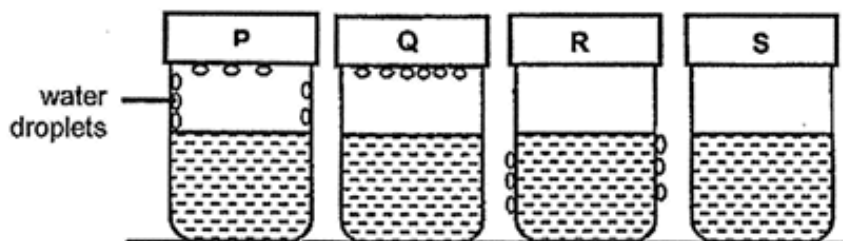
(i) Draw **two** arrows in the diagram to show how plants can be part of this water cycle. [1]



(ii) Based on the diagram of the water cycle above, complete the table below. [2]

	Process A	Process B
Name of Process		
Does water gain or lose heat?		

(b) Four similar cups, P, Q, R and S, were filled with the same amount of water at different temperatures. The cups were then placed on the table for five minutes. Water droplets were formed.

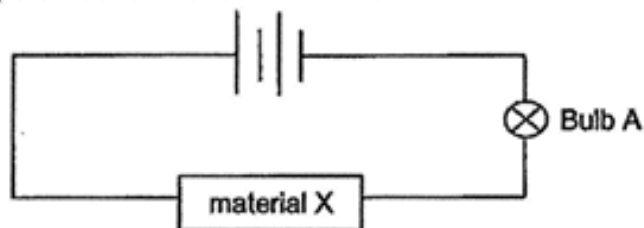


Which cup/s (P, Q, R or S) is/are most likely to contain water at room temperature?

Cup/s _____

[1]

37. Peggy set up an electrical circuit as shown below.



(a) Bulb A lit up. State a possible material for X.

[1]

(b) Peggy replaced material X with another Bulb B at the same circuit. Both Bulb A and Bulb B lit up when the circuit was closed.

What would happen to the ~~brightness~~ of Bulb A as compared to the first experiment in (a)? Circle your answer below.

[1]

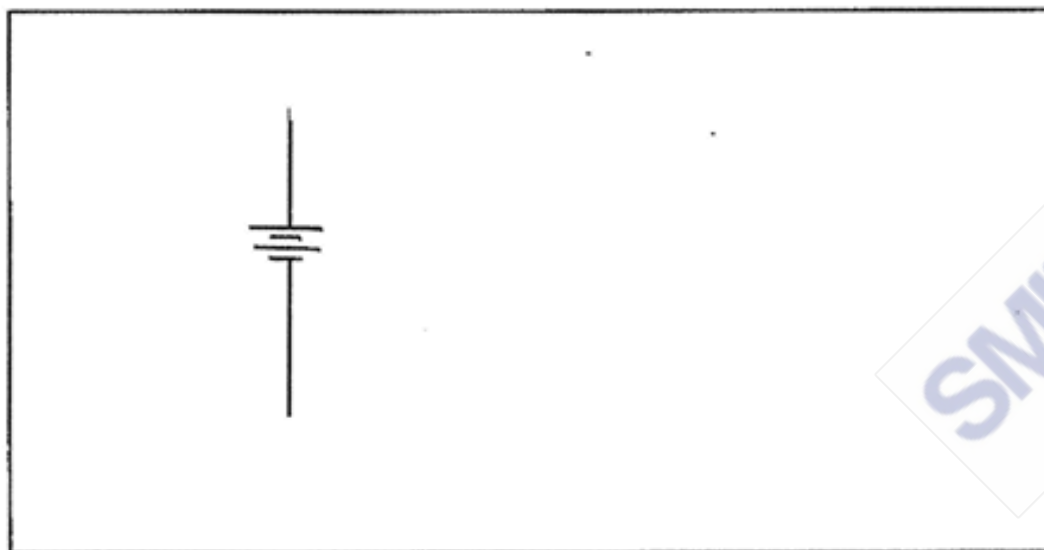
Increase

Remain the same

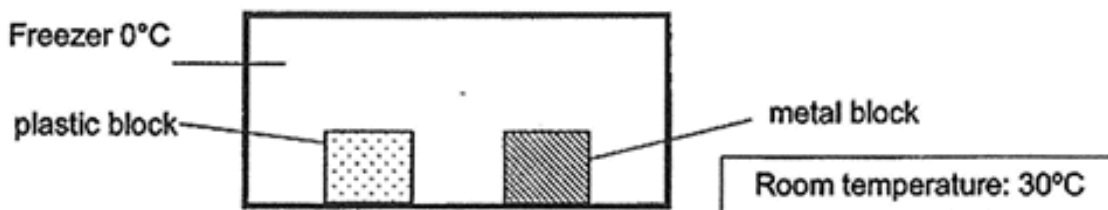
Decrease

(c) Draw a circuit diagram in the box below such that both bulbs A and B would be brighter than when they are in (b) by using some wires, bulbs A and B and two batteries.

[1]



38. Two blocks of the same volume, a metal block and a plastic block, were placed into a freezer of temperature 0°C for a week as shown below.



Pei Hwa recorded the temperatures of both blocks after a week.

- (a) Put a tick in the table below to indicate the temperature of each block in the freezer after one week.

[1]

	Temperature of the block		
	0°C	10°C	30°C
Plastic block			
Metal block			

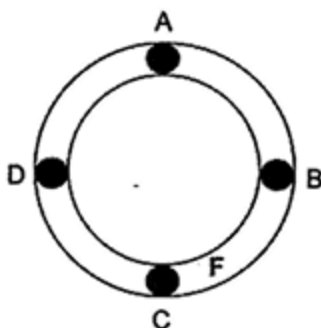
- (b) The blocks were then taken out of the freezer and placed on the table. Which block, plastic or metal, will reach room temperature first? Explain your answer.

[2]

39. (a) State how heat travels.

[1]

(b) Adrian conducted an experiment using four similar amount of wax, A, B, C and D, on a metal ring. They were placed at different positions on the ring as shown below.



(i) A flame is placed at position F. State the order in which the wax will start to melt, starting with the first.

[1]

First drop of wax to melt → Last drop of wax to melt

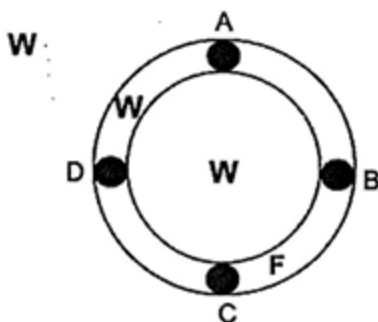
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(ii) If the metal ring is changed to a ceramic ring, will the drops of wax melt sooner or later? Explain your answer.

[2]

(c) If Adrian wanted all the wax, A, B, C and D, to melt at the same time, indicate the position where Adrian should place the flame.

Circle the correct W on the diagram below to indicate the position of the flame. [1]



12

End of Booklet B



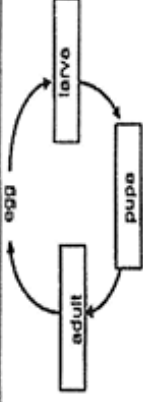
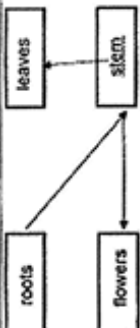
ANSWER SHEET

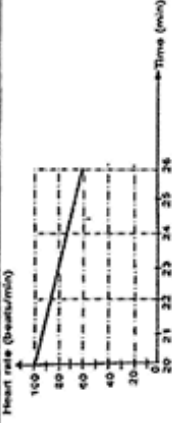
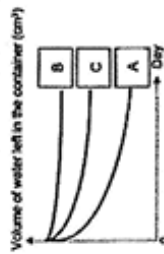
SECTION A

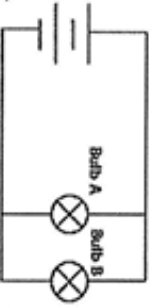
Q 1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	1	2	3	3	2	4	1	2	3
Q 11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
1	3	2	2	4	3	4	2	3	3
Q 21	Q22	Q23	Q24	Q25	Q26	Q27	Q28		
2	3	4	3	4	3	1	4		

Name: _____ () Class: _____

 SINGAPORE CHINESE GIRLS' SCHOOL
 SA2 2022 PRIMARY 5 SCIENCE

S/N	Answers
29a	(i) The roots grow first as it needs to absorb water/ take in water for germination. (ii) Seed leaf OR seed leaves
29b	i)  (ii) The butterfly helps to pollinate the flowers of the plant.
30a	
30b	(i) Increase (ii) The width increased because the food could not be transported down below W as the food-carrying tubes were removed. (iii) The roots of the tree died as they could not receive any food from the leaves/ food from the leaves could not be transported to the roots. (iv) The leaves could not make food and died because they could not get any water as the roots have died and could not take in water.
31a	Jolene's heart rate increases when the time taken for her exercise increases.

S/N	Answers						
31b	Oxygen from the surrounding air is taken in by the lungs and is absorbed by the blood which carries it to the heart to be pumped to the legs.						
31c							
32a							
32b	Set-up A had the most number of leaves, so the roots took in/ absorbed the most amount of water and gave out the most amount of water/ water vapour through its leaves/stomata thus the least amount of water was left in the container.						
32c	Placing them at the same place ensures that the temperature of the surroundings/ humidity/ amount of light/ amount of wind each set-up is exposed to was the same.						
33a	<table border="1"> <thead> <tr> <th>Plant/plant</th><th>Dispersal method</th></tr> </thead> <tbody> <tr> <td>(i) ▲</td><td>Water</td></tr> <tr> <td>(ii) ●</td><td>Wind</td></tr> </tbody> </table> (iii) Its seedlings are found along the river bank/ sides of the river.	Plant/plant	Dispersal method	(i) ▲	Water	(ii) ●	Wind
Plant/plant	Dispersal method						
(i) ▲	Water						
(ii) ●	Wind						
33b	(i) They are dispersed by animals. (ii) Fruit F attaches/ hooks onto animals' fur/ hair and drops off at a different place.						

S/N	Answers								
34a	Food /glucose /sugar and oxygen								
34b	Beaker with leaf X. Leaf X is only painted on top surface but leaf Y is painted only on the bottom. As the bottom has more stomata, this means leaf X has more stomata exposed/unblocked. Thus, when leaf X photosynthesize/make food under the sun, it gives out more oxygen as bubbles than leaf Y.								
35a	(iii) All variables are ticked except 'Amount of air bubbles' a) has digestive juices / can digest food a) does not have digestive juices/ cannot digest food								
35b	Saliva								
35c	Our teeth helps to break the food into smaller pieces thus the food has more (surface) area in contact with the digestive juice, allowing the food to digest faster. Note – Definition of 'Digestion' - Break down food into simpler substances. Teeth cannot 'break down' food as teeth cannot digest food. Teeth can 'break up' food into 'smaller pieces'.								
36a	(i) One arrow from rain to plants One arrow from plants to water vapour								
36a (ii)	<table border="1"> <thead> <tr> <th>Process A</th><th>Process B</th></tr> </thead> <tbody> <tr> <td>Name of Process</td><td>Evaporation</td></tr> <tr> <td>Does it gain or lose heat?</td><td>Gains heat</td></tr> <tr> <td></td><td>Looses heat</td></tr> </tbody> </table>	Process A	Process B	Name of Process	Evaporation	Does it gain or lose heat?	Gains heat		Looses heat
Process A	Process B								
Name of Process	Evaporation								
Does it gain or lose heat?	Gains heat								
	Looses heat								
36b	S								
37a	Any specified material that is a conductor of electricity, example, iron, copper, silver, gold, lead, carbon								
37b	Decrease Answer is not exhaustive.								
37c									

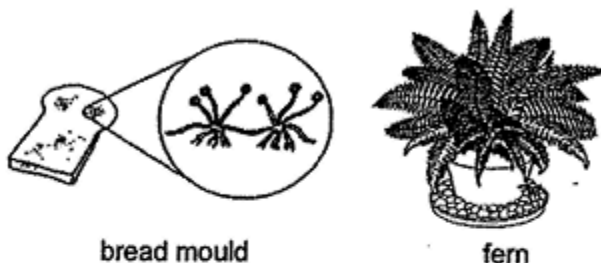
S/N	Answers
38a	Tick both at 0°C.
38b	Metal reaches room temperature (from 0°C) first as metal is a better conductor of heat than plastic. Thus metal can gain heat faster from the surrounding/ Heat can be conducted faster from surroundings to metal.
39a	Heat travels from a hotter place to a cooler place.
39b	(i) C B D A
39c	Ceramic is a poorer conductor of heat than metal, so it will conduct heat slower from the flame/ heat source to the wax, so the wax will melt slower.
39c	Choose the 'W' in the middle of the ring.

CHIJ ST NICHOLAS GIRLS' SCHOOL EOY PAPER

Section A (28 x 2 marks = 56 marks)

For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). **Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet provided.**

1. Which of the following correctly shows the similarity and difference between the bread mould and the fern?



	Similarity	Difference
(1)	Both are microorganisms.	The bread mould produces spores but the fern produces seeds.
(2)	Both can make their own food.	The bread mould does not have leaves but the fern has leaves.
(3)	Both respond to changes.	The bread mould is a fungi but the fern is a flowering plant.
(4)	Both reproduce by spores.	The bread mould cannot make its own food but the fern can make its own food.

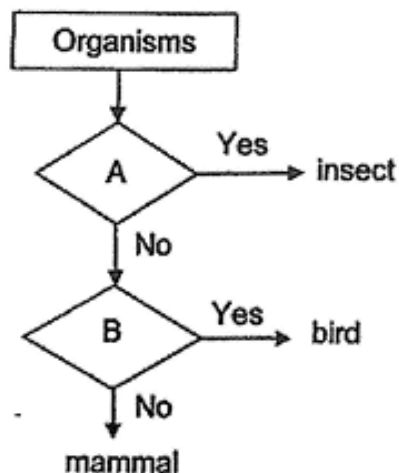
2. Which of the following is a function of the human skeletal system?

- (1) protects organs in the body
- (2) protects the muscular system
- (3) transports blood around the body
- (4) transports food in the digestive system

3. Which one of the following organisms is not a fungus?

- (1) fern
- (2) yeast
- (3) mould
- (4) mushroom

4. Study the flow chart below.



Which of the following shows the characteristics represented by A and B?

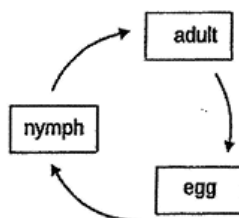
Characteristics		
	A	B
(1)	has fur	has beak
(2)	has six legs	has feathers
(3)	has wings	has fur
(4)	has hard body covering	gives birth to young

5. Which of the following characteristic(s) is/are found in birds, but not in other animals?

- A They lay eggs.
- B They have wings.
- C They have a streamlined body.
- D They have feathers on their bodies.

- (1) B only
- (2) D only
- (3) A, B and D only
- (4) A, B, C and D

6. The diagram below shows the life cycle of a living thing.



Which one of the following is likely to have a similar life cycle?

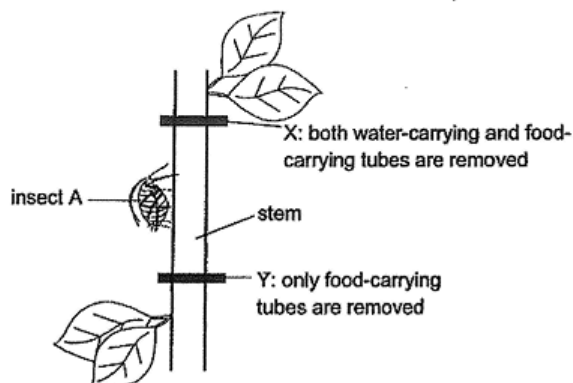
- (1) Frog
- (2) Chicken
- (3) Butterfly
- (4) Dragonfly

7. Which one of the following shows the correct sequence of the life cycle of a flowering plant?

- A A fruit forms.
- B A seed germinates.
- C The plant bears flowers.
- D A seedling becomes an adult plant.
- E The petals wither.

- (1) A → D → E → B → C
- (2) B → D → C → E → A
- (3) C → A → D → B → E
- (4) D → A → B → C → E

8. The diagram below shows insect A on the stem of a plant. It feeds on food made by the leaves. Two cuts X and Y were made on the stem of the plant.



Which of the following statements about insect A is true?

	Can insect A feed on food made by the leaves?	Explanation
(1)	No	Food made by the leaves above X cannot be transported upwards.
(2)	No	Food made by the leaves above X cannot be transported downwards.
(3)	Yes	Food is found in the water-carrying tube above Y.
(4)	Yes	Food made by leaves below Y is transported upwards.

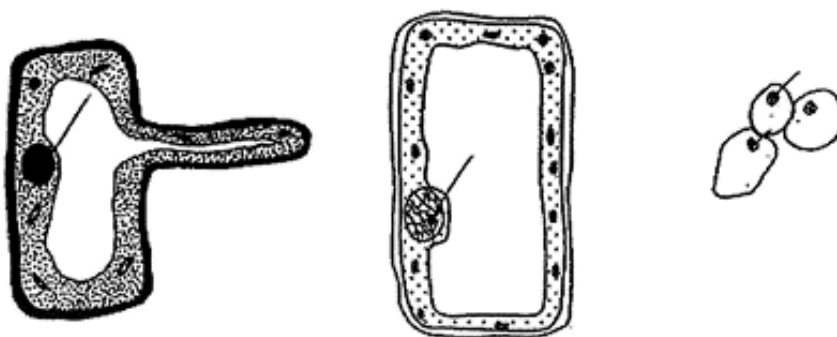
9. Ms Tan was making a cup of coffee using a filter bag as shown below. She poured hot water into the filter bag and the bag prevents the coffee powder from getting into the cup.



Which part of a cell has a similar function as the filter bag?

- (1) Nucleus
- (2) Cell wall
- (3) Cytoplasm
- (4) Cell membrane

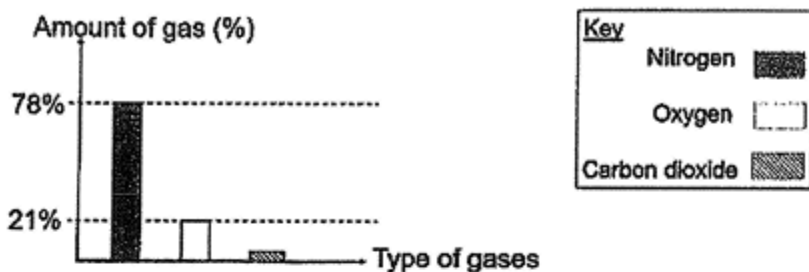
10. Study the diagrams of the three different types of cells shown below.



Which of the following parts are present in all the three types of cells?

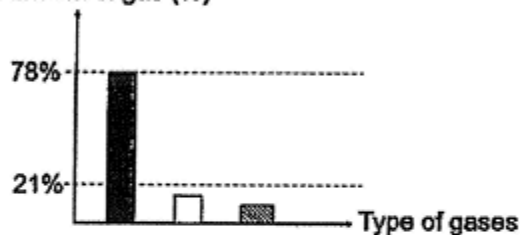
- (1) Nucleus, cytoplasm and cell wall
- (2) Nucleus, chloroplast and cytoplasm
- (3) Nucleus, cell membrane and cytoplasm
- (4) Nucleus, cell wall, cell membrane and cytoplasm

11. The graph below shows the amount of nitrogen, oxygen and carbon dioxide in the air that we breathe in.

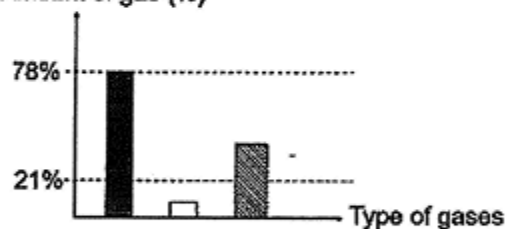


Which of the following graphs most likely shows the amount of these gases in the air that we breathe out?

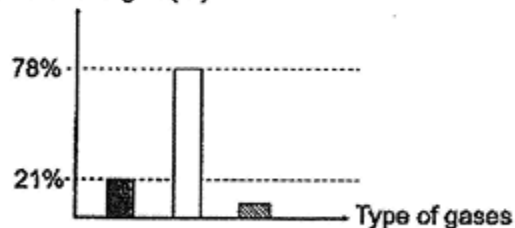
- (1) Amount of gas (%)



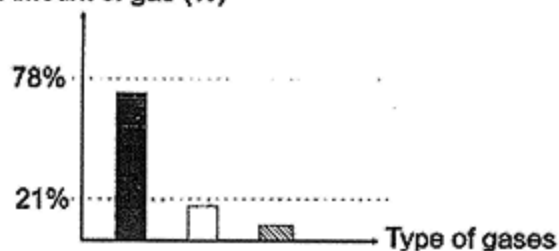
- (2) Amount of gas (%)



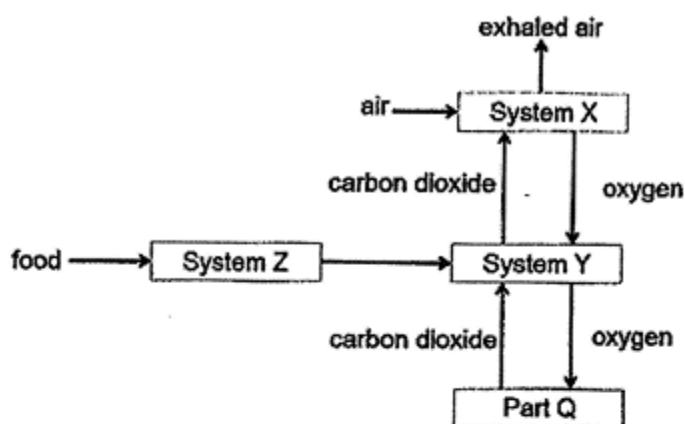
- (3) Amount of gas (%)



- (4) Amount of gas (%)



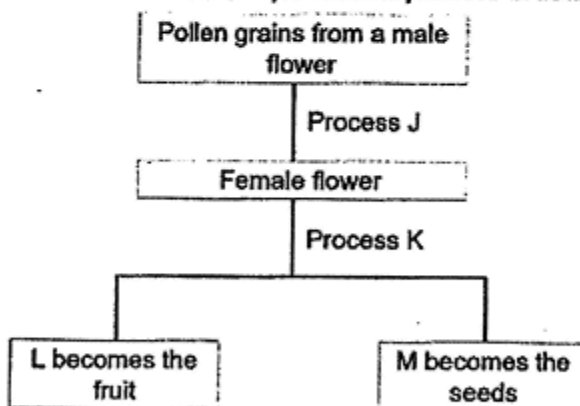
12. The diagram below shows three human body systems.



Which of the following correctly shows Systems X, Y, Z and Part Q?

	System X	System Y	System Z	Part Q
(1)	Circulatory	Digestive	Respiratory	Legs
(2)	Respiratory	Digestive	Circulatory	Heart
(3)	Circulatory	Respiratory	Digestive	Lungs
(4)	Respiratory	Circulatory	Digestive	Head

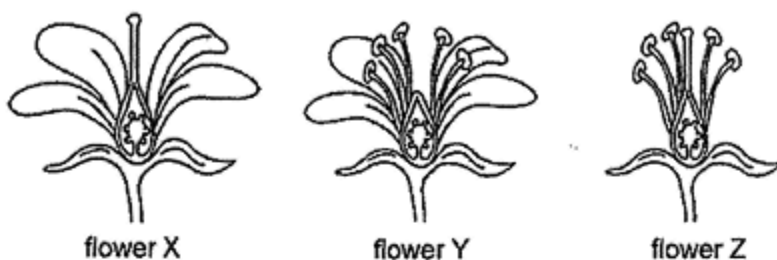
13. The flow chart below shows the reproduction process in flowering plants.



Which of the following correctly represents J, K, L and M?

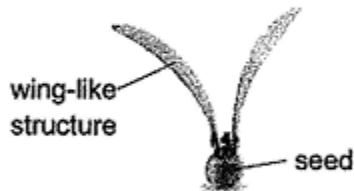
	Process		Part of the flower	
	J	K	L	M
(1)	pollination	germination	ovules	ovary
(2)	fertilisation	pollination	ovules	ovary
(3)	germination	fertilisation	ovary	ovules
(4)	pollination	fertilisation	ovary	ovules

14. The flowers below show some parts of it being removed.



Which flower(s) will not be able to become a fruit?

- (1) Flower Y only
 - (2) Flowers X and Y only
 - (3) Flowers Y and Z only
 - (4) None of the flowers
15. Susan wanted to find out how the length of the wing-like structure of a fruit affects the distance it is dispersed.



She prepared four set-ups as described in the table below.

Set-up	Length of wing (cm)	Mass of seed (g)	Presence of wind
A	5	9	Yes
B	5	9	No
C	10	9	Yes
D	10	12	Yes

Which pair of set-ups should Susan use to conduct a fair test?

- (1) A and B
- (2) B and C
- (3) A and C
- (4) C and D

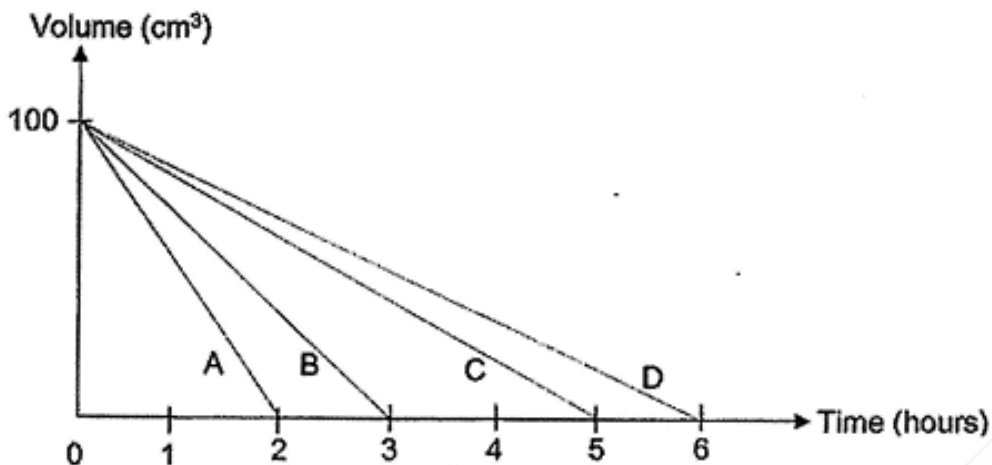
16. The table below shows the boiling and melting points of three substances X, Y and Z.

Substances	X	Y	Z
Boiling Point ($^{\circ}\text{C}$)	25	185	70
Melting Point ($^{\circ}\text{C}$)	0	29	12

Which one of the following shows the states of the substances X, Y and Z at room temperature of 28°C ?

	X	Y	Z
(1)	liquid	solid	gas
(2)	gas	liquid	solid
(3)	gas	solid	liquid
(4)	solid	gas	liquid

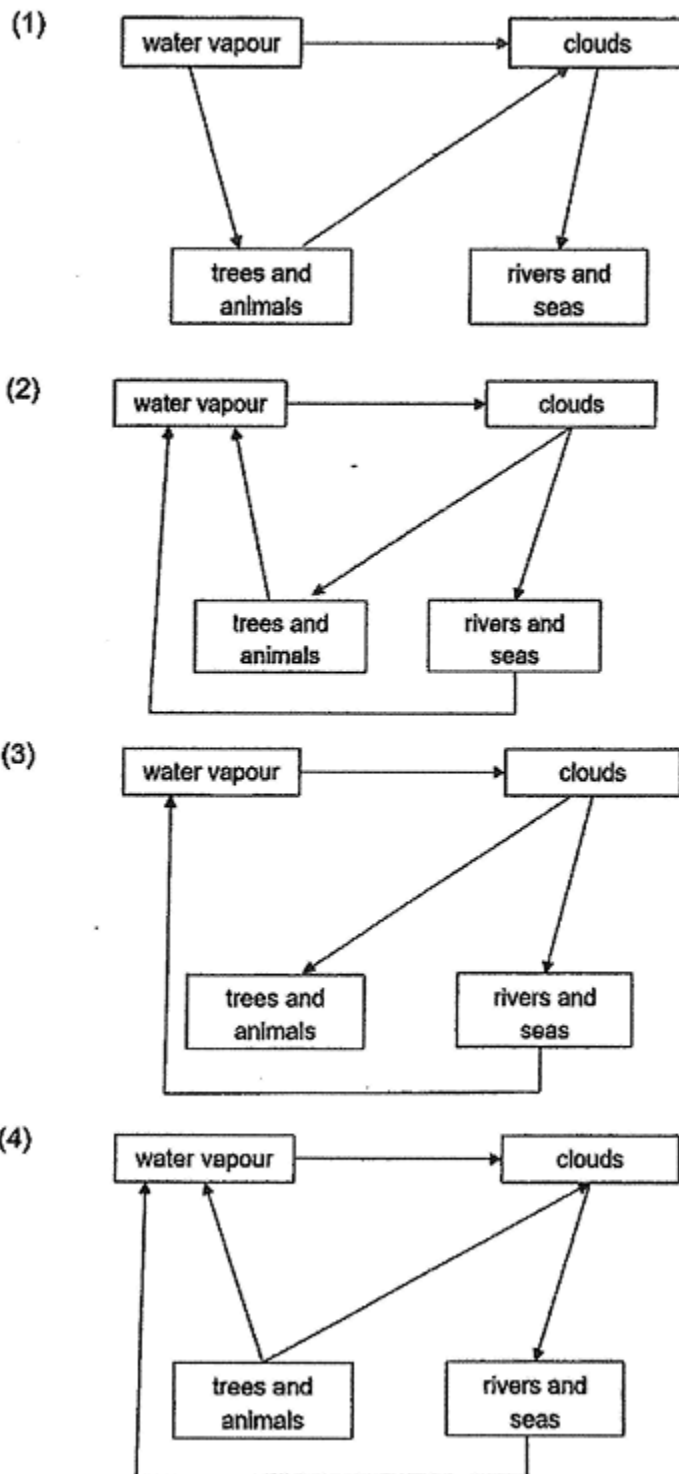
17. Four different containers A, B, C and D were left at the same place. Each container contained 100 cm^3 of water at the same temperature. At every hour, the volume of water in each container was measured and recorded. The graph below shows how the volume of water in the container changed over six hours.






Based on the graph, which statement is correct?

- (1) Water in D has a larger exposed surface area than water in A.
- (2) Water in C has a larger exposed surface area than water in B.
- (3) Water in B has a smaller exposed surface area than water in D.
- (4) Water in C has a smaller exposed surface area than water in A.

18. Which of the following diagrams correctly shows how trees and animals play a part in the water cycle?

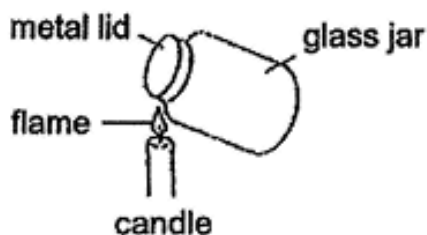


19. Koon Seng measured the volume and mass of 3 balls that are made of different materials. He recorded the results in the table below.

Ball	Volume	Mass
A 	50 cm ³	500 g
B 	150 cm ³	300 g
C 	200 cm ³	300 g

Based on the information given, which one of the following conclusions is false?

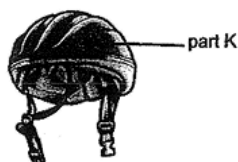
- (1) Balls of different sizes can have the same mass.
 - (2) A smaller ball occupies less space than a bigger object.
 - (3) Balls of different sizes occupy different amount of space.
 - (4) A ball that occupies less space is lighter than an object that occupies more space.
20. Bala used the set-up below to open the tight metal lid of a glass jar.



Why was he able to open the tight metal lid more easily after heating it for some time?

- (1) The glass jar contracted.
- (2) The metal lid and the glass jar expanded.
- (3) The metal lid expanded more than the glass jar.
- (4) The air in the glass jar expanded and pushed the metal lid open.

21. Some tests were conducted before deciding on the most suitable material for making part K of the safety helmet worn by cyclists as shown below. The helmet is to protect the cyclist's head when he falls.



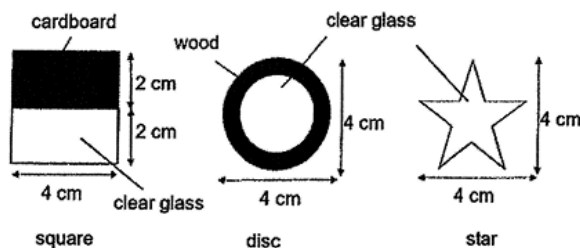
The questions asked during the tests are recorded in the table below.

Test	Question
A	Is the material light?
B	Is the material strong?
C	Is the material waterproof?
D	Is the material transparent?

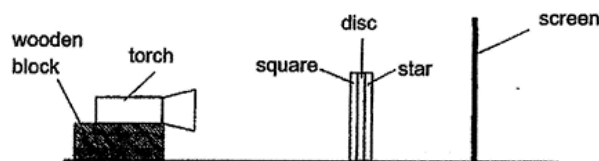
Which tests are the most important in deciding the most suitable material in making part K of the safety helmet?

- (1) A and B only
- (2) C and D only
- (3) A, B and C only
- (4) B, C and D only





22. The diagram shows three objects of different shapes and made of different materials.



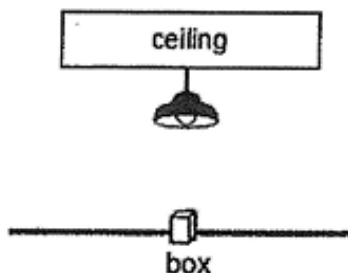
The three objects were glued together. They were placed between a torch and a screen as shown below.



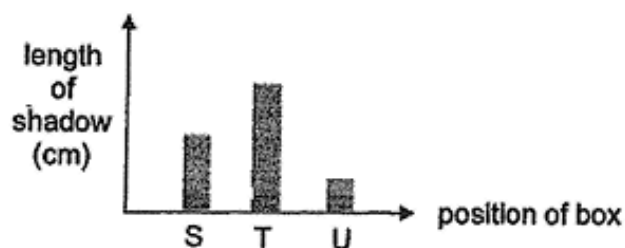
Which of the following shows the correct shadow on the screen?

- (1) 
- (2) 
- (3) 
- (4) 

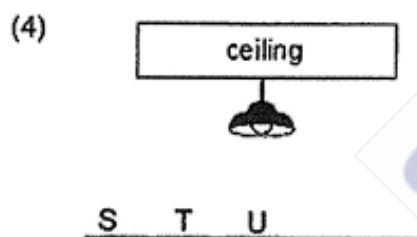
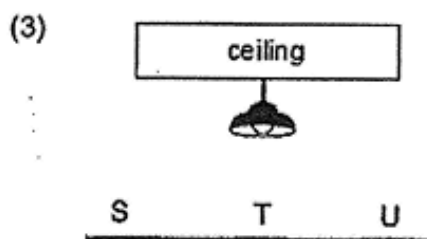
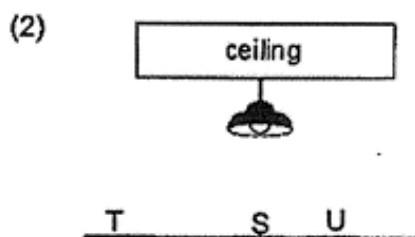
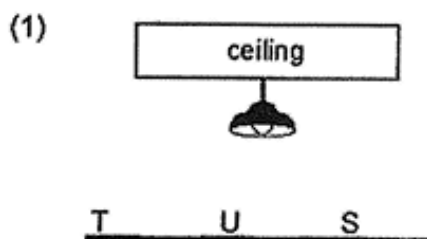
23. Alan placed a box under a ceiling light as shown below. The box was moved randomly to three different positions S, T and U and the length of the shadow formed on the ground was measured.



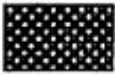


He recorded the results in the graph shown below.



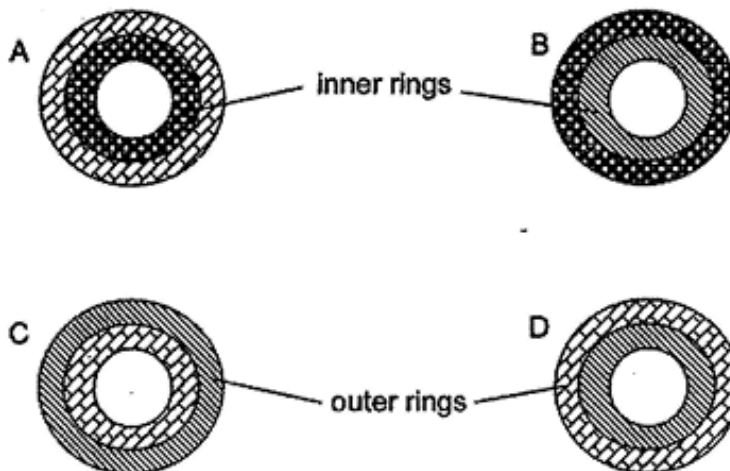
Which of the following shows the correct positions of the box?



24. The table below shows the length of three metals when heated to 100 °C.

Key	Metal	Length of metal at room temperature (mm)	Length of metal at 100 °C (mm)
	P	100	111
	Q	100	102
	R	100	106

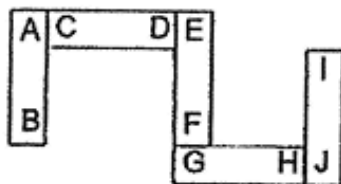
Metals P, Q and R were used to make rings as shown below. The rings were immersed in cold water at 10 °C for 10 minutes.



Which of the inner rings could be easily removed at the end of 10 minutes?

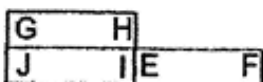
- (1) A only
- (2) A and C only
- (3) B and D only
- (4) C and D only

25. Five bar magnets are placed together as shown in the diagram below.

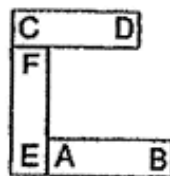


Which of the following arrangements is possible when three of the bar magnets from the above set-up are brought close together?

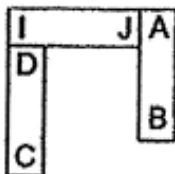
(1)



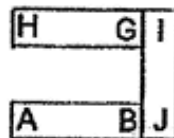
(2)



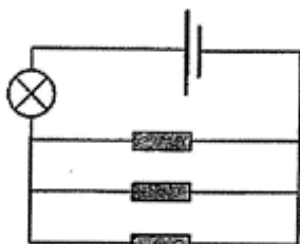
(3)



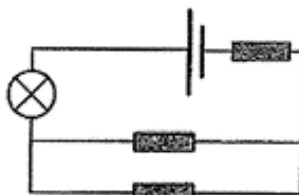
(4)



26. Ron set up two circuits X and Y as shown below. In each circuit, there is a plastic rod, a glass rod and a copper rod.



Circuit X



Circuit Y

Key:

Rod: 

In which circuit(s) will the bulb light up?

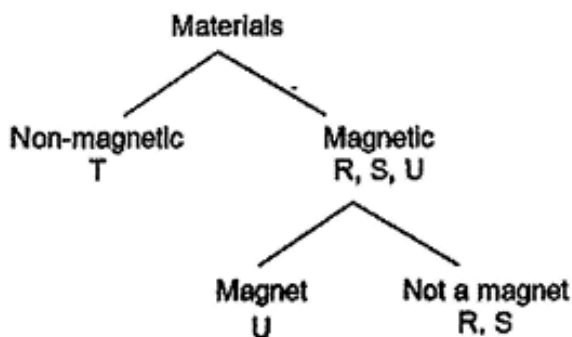
- (1) Circuit X only
- (2) Circuit Y only
- (3) Circuit X and Y
- (4) None of the circuits

27. Hassan tested 4 rods of different materials R, S, T and U. He placed a magnet near the two ends of each rod and recorded his observations in the table below.

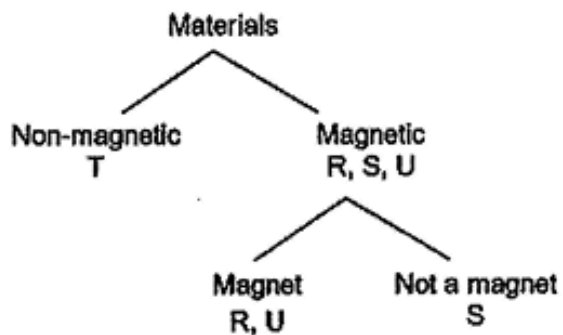
Material	Left end of the rod	Right end of the rod
R	attracted	attracted
S	attracted	attracted
T	not attracted	not attracted
U	attracted	repelled

Which one of the following classification charts below reflects the results of Hassan's tests?

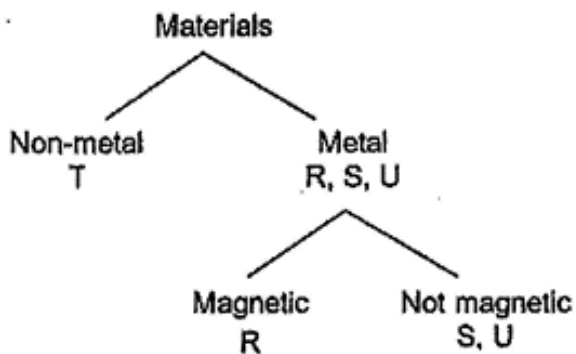
(1)



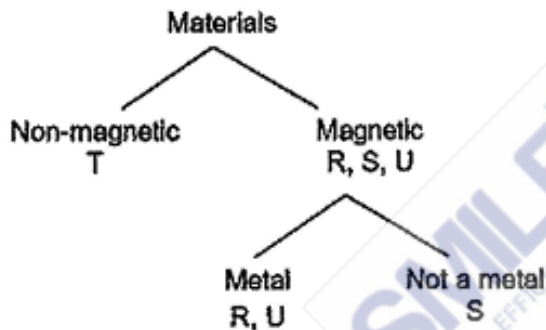
(2)



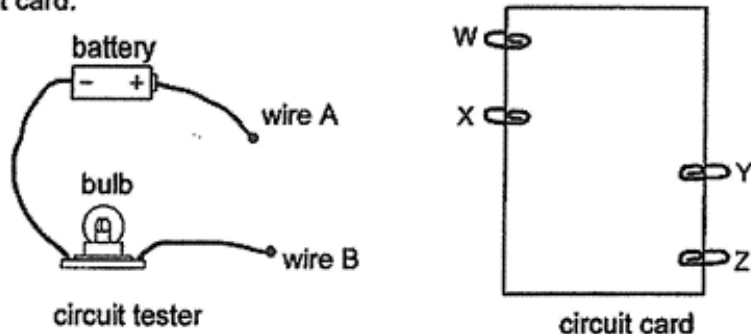
(3)



(4)



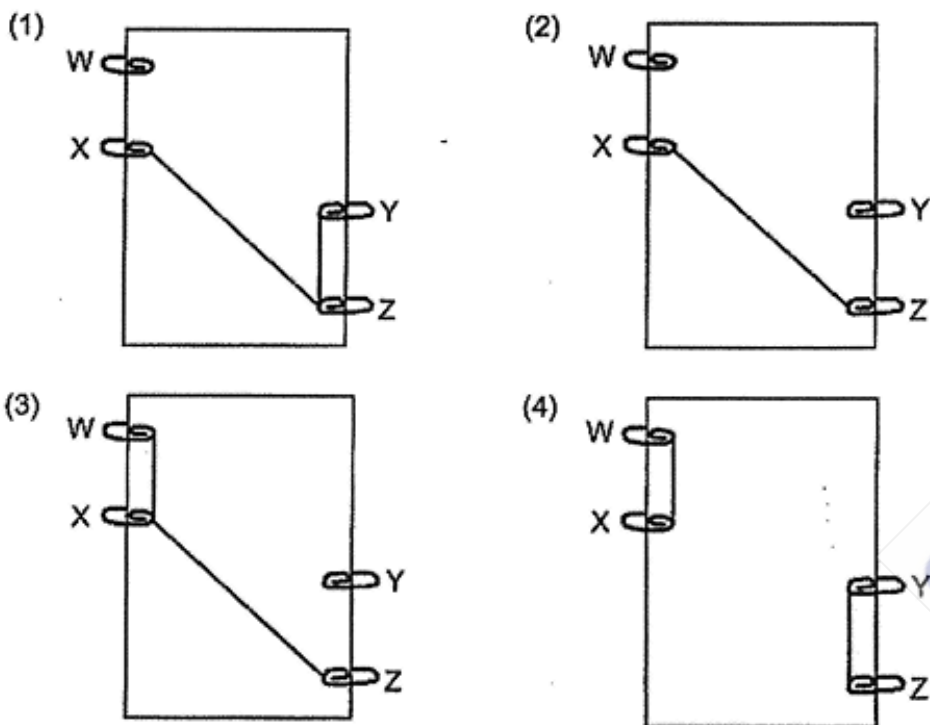
28. The diagram shows a circuit tester and the top view of a circuit card with four steel clips, W, X, Y and Z. The steel clips are connected with wires on the underside of the circuit card.



The table below shows the results when wires A and B of the circuit tester are connected to a pair of steel clips.

Steel clips	Did the bulb light up?
W and X	Yes
W and Y	No
W and Z	Yes
X and Y	No
X and Z	Yes

Which of the following is a correct connection on the underside of the circuit card that will give the results shown in the table above?

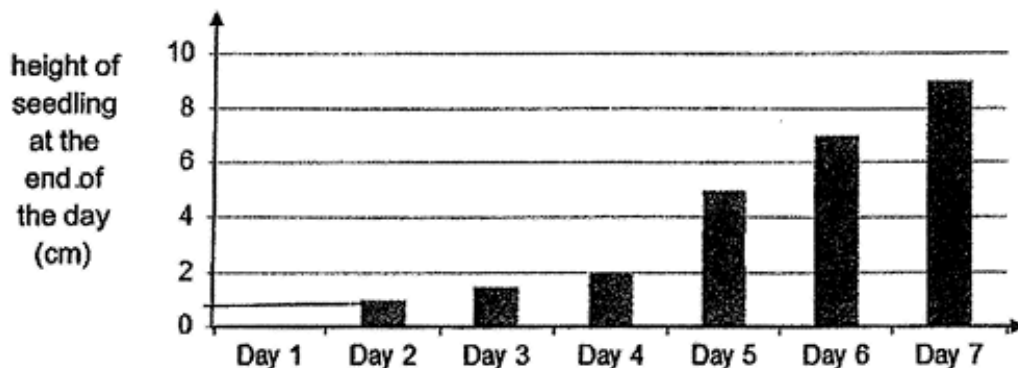


END OF BOOKLET A

Section B (44 marks)

For questions 29 to 40, write your answers in this booklet. The number of marks available is shown in the brackets at the end of each question or part question.

29. The bar graph below shows the growth of a bean seedling over a span of 7 days.

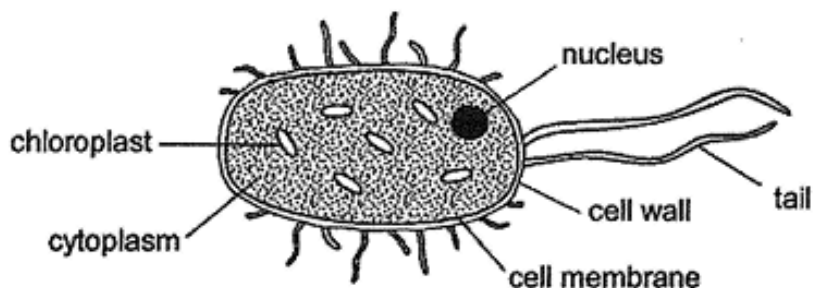


- (a) How many centimetres did the seedling grow from Day 2 to Day 5? [1]

- (b) On which day was the fastest growth observed? [1]

- (c) State all the necessary conditions for germination of seeds to occur. [1]

30. The diagram below shows a single-celled organism which lives in a pond.

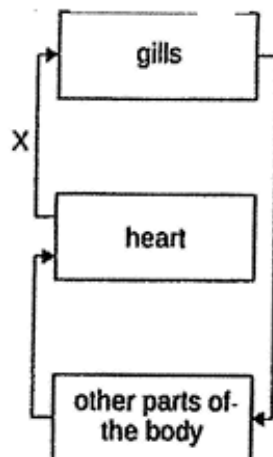


- (a) Name two parts in the organism which shows that it is more likely to be a [1]
plant cell than an animal cell.

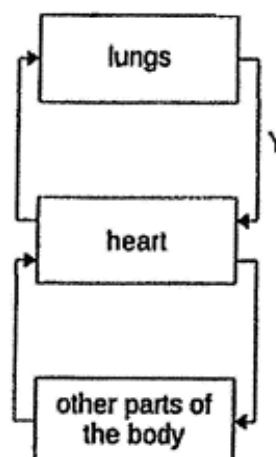
- (b) This single-celled organism does not depend on any other organisms for [1]
food. Why is it so?

- (c) State the function of the cytoplasm. [1]

31. The diagrams below show the direction of blood flow in a fish and in a human respectively.



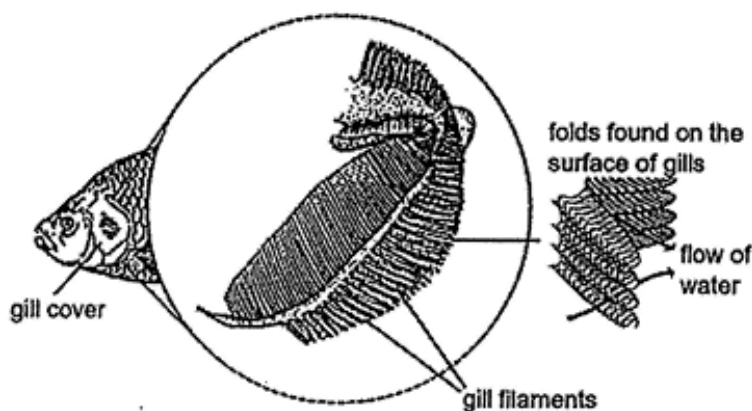
the circulatory system of a fish



the circulatory system of a human

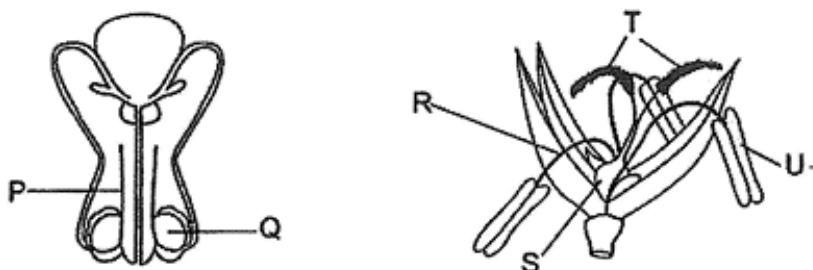
- (a) State the difference between the amount of oxygen and carbon dioxide found in the blood flowing in X and Y. [2]

Fish use gills to breathe in water. The diagram below shows the magnified view of the gills of a fish.



- (b) The gill filaments are folds found on the surface of the gills. Explain how the folds found on the surface of gills help the fish to survive better in water low in dissolved oxygen. [2]

32. The diagrams below show the human reproductive system and the plant reproductive system.



- (a) Which of the following statement(s) is/are correct about human and plant reproductive systems? Put a tick (✓) in the box. [1]

	Statements	Tick (✓) if it is correct
1.	Fertilisation takes place in P and S.	
2.	The reproductive cells will travel down P and R.	
3.	The male reproductive cells are found in Q and U.	
4.	P and T has the same function in its reproduction process.	

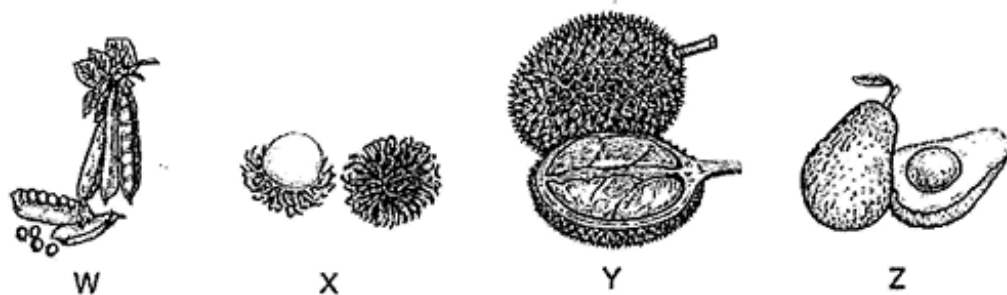
The diagram below shows another flower with brightly coloured petals. Part Y of the flower contains yellow powdery substances and part X feels sticky when touched.



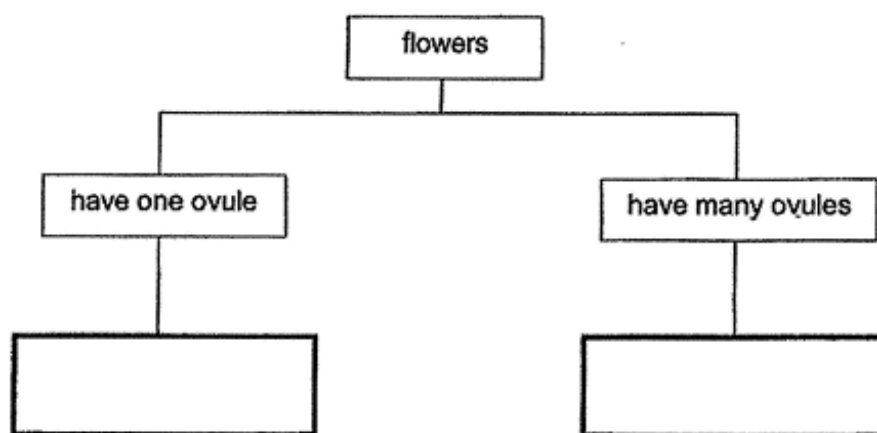
- (b) Name the yellow powdery substances. [1]

- (c) Based on the information above, state how the sticky substance in part X helps in the pollination of the flower. [1]

33. The diagrams below show fruits W, X, Y and Z which have been cut open.

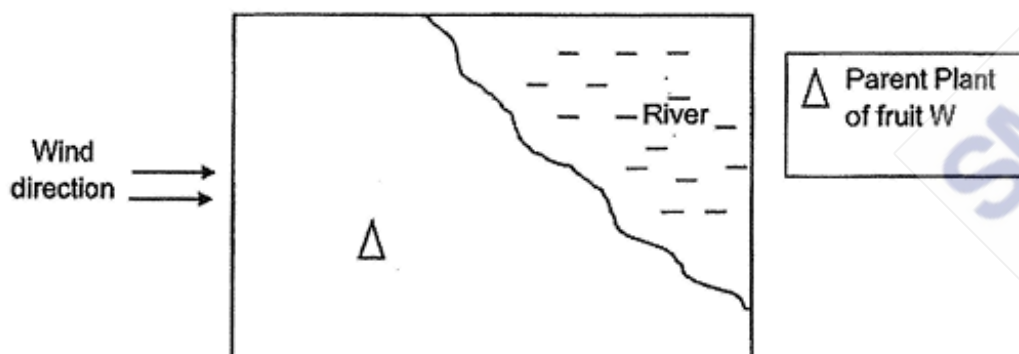


- (a) Classify fruits W, X, Y and Z based on the number of ovules their flowers have in the classification chart below. [2]

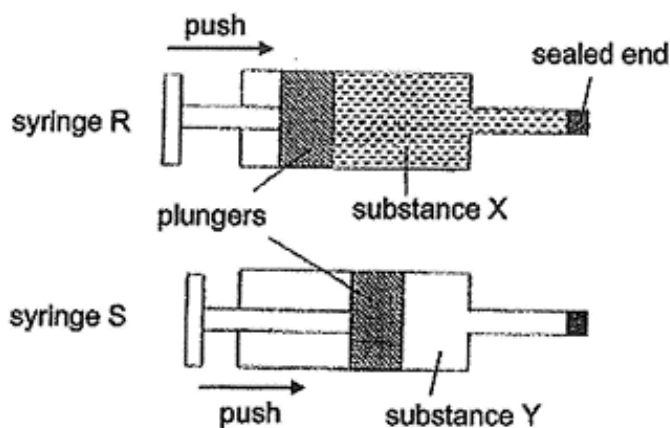


- (b) State one advantage of having many ovules. [1]

- (c) In the space given below, mark with 5 crosses "X" to show where the young plant of fruit W will most likely be after it is being dispersed. [1]



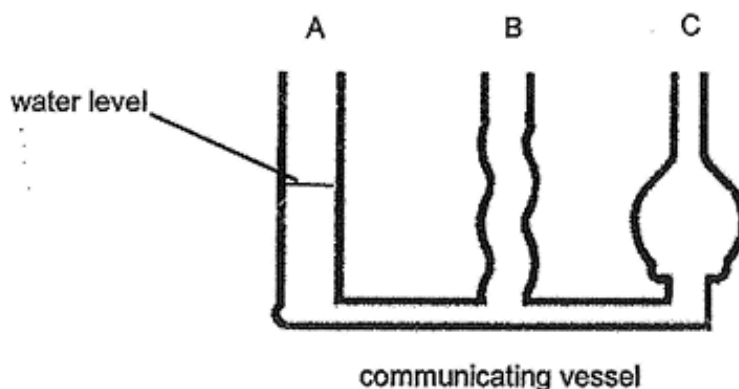
34. Two similar syringes R and S contained substances X and Y respectively. The end of each syringe was sealed. The plunger of syringe R could not be pushed in while the plunger of syringe S could.



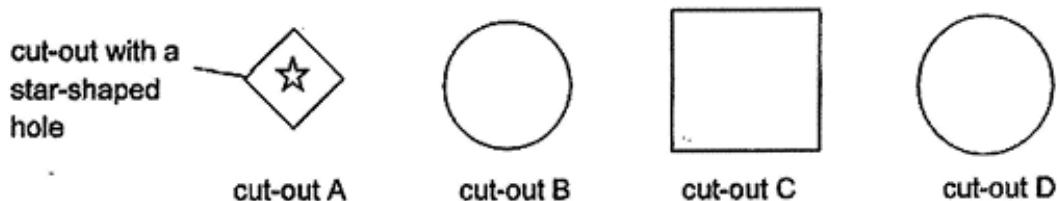
- (a) What is the likely state of matter of substance Y? [1]

- (b) Explain your answer in (a). [1]

- (c) The diagram below shows a communicating vessel. Peter poured 500 ml of water into the vessel and drew the water level in part A as shown. Draw a line to show the water level in part B and part C of the vessel. [1]



35. Ah Seng had 4 cut-outs made of different materials as shown below. The diagrams are drawn to scale.



He placed the four cut-outs in front of a torch as shown in the diagram below.



Ah Seng turned on the torch and recorded his observation on cut-out C as shown below.



- (a) Based on Ah Seng's observation, state whether materials A and B are transparent, translucent, or opaque. [2]

Cut-out	Transparency of material
A	
B	

- (b) Based on the results of his experiment, can he find out the transparency of material D? Explain your answer. [1]

- (c) What property of light enables the star-shaped light to be seen on cut-out C? [1]

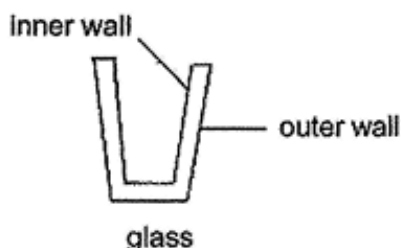
36. Lily had two similar sheets X and Y made of the same material. She placed the sheets on a heater as shown below.



At the start, sheets X and Y were of the same length. After a while, sheet Y became longer than sheet X.

- (a) Explain why sheet Y became longer than sheet X after a while. [2]

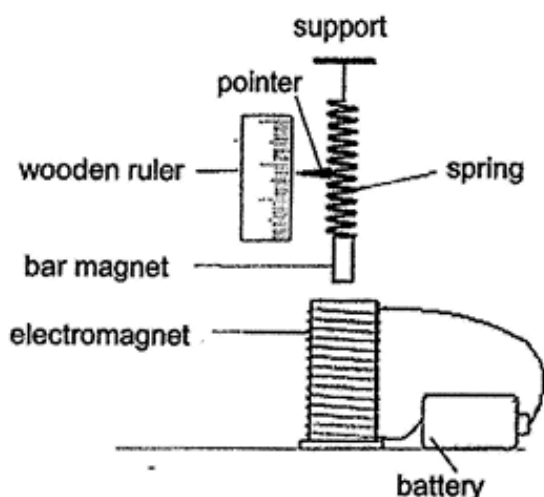
- (b) Lily had a glass with thick walls as shown.



When she poured some boiling water quickly into the glass, the glass cracked. Explain why. [2]

- (c) Give an example of a poor conductor of heat that is often used to make the handles of cooking utensils. [1]

37. In the set-up below, the bar magnet is **repelled** by the electromagnet. A pointer attached to the spring moves upwards towards the support when the circuit is closed.

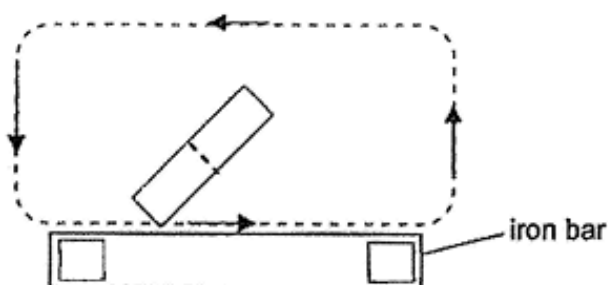


One other electrical component was added to the set-up. It was observed that the pointer moves a further distance away from the electromagnet.

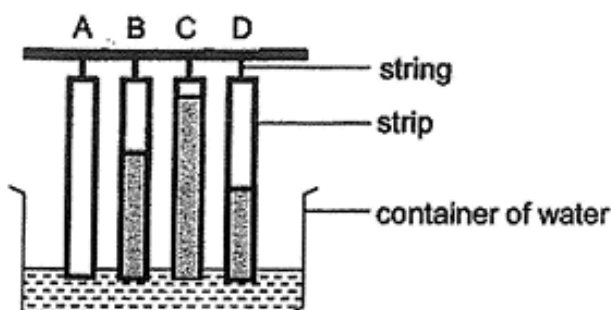
- (a) State the electrical component that was added. [1]

- (b) Explain your answer in (a) above. [2]

- (c) The diagram below shows the stroke method of magnetising an iron bar. Label the poles of the iron bar when it is magnetised. [1]



38. Jordan conducted an experiment to measure the amount of water absorbed by four strips of different materials A, B, C and D. The four strips were of the same size and thickness. He dipped them into a container of water for ten minutes as shown below. The shaded part of the strips shows the absorption of water by the four strips of materials.

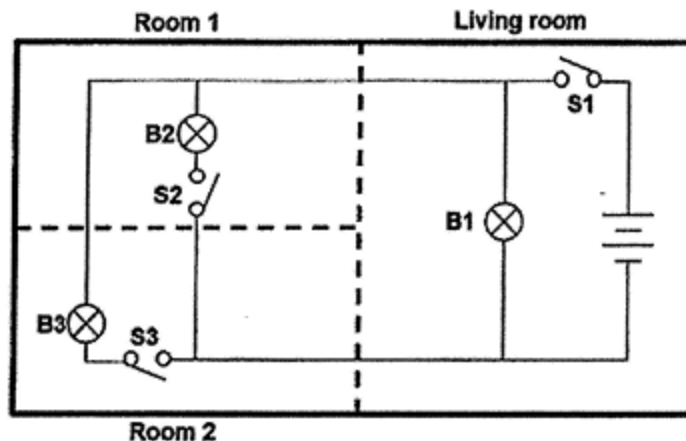


- (a) Why must the strips of material be of the same size and thickness? [1]

- (b) Based on the results above, state a property of material A [1]

- (c) Jordan's teacher suggested that he should change the water in his experiment to coloured water. State a reason for this suggestion. [1]

39. The diagram below shows the layout of a flat with its simplified electrical circuit. There is a light bulb and a switch in each room. All the circuit components are working.



- (a) Based on the diagram above, identify one disadvantage of such a circuit system.

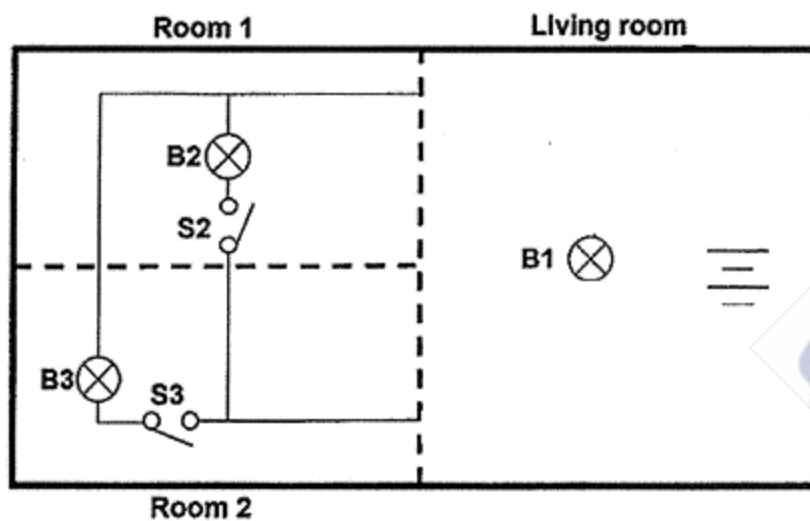
[1]

Another bulb is added to the living room to further brighten the room.

- (b) Complete the circuit below by adding this additional light bulb in the living room such that:

[2]

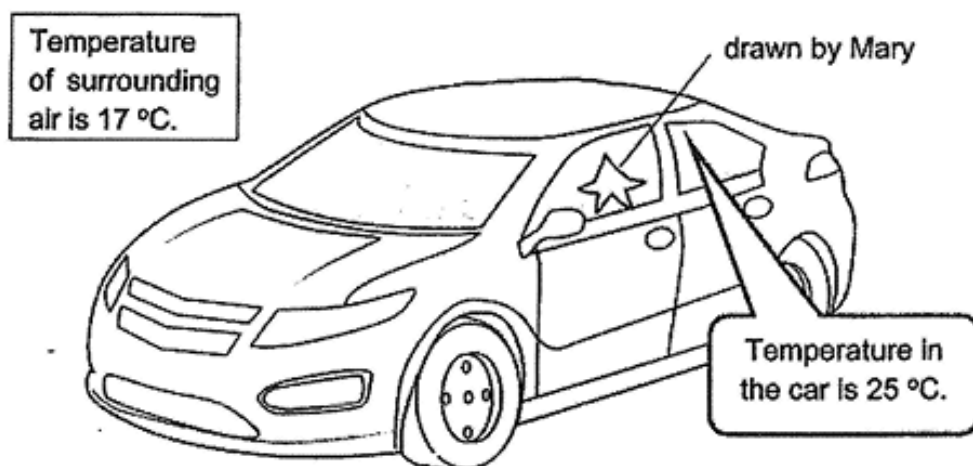
- All the bulbs will light up of equal brightness when all switches are closed.
- S1 will operate the bulbs in the living room only.



40. (a) What is evaporation?

[1]

The diagram below shows a car with its glass windows fogged up.



(b) Mary drew a star on one of the windows of the car as shown above. Was Mary in the car or outside the car when she drew the star?

[1]

(c) Explain your answer in (b).

[2]


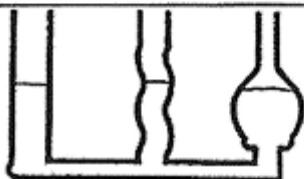
(d) The car was then parked indoors with a surrounding temperature of 30 °C. Will the 'star' remain on the window, or will it disappear? Explain why.

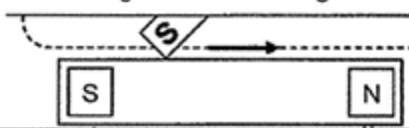
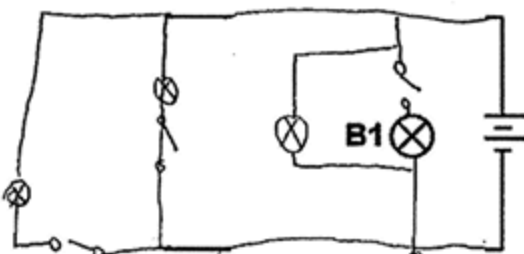
[1]

ANSWER SHEET

SECTION A

Q 1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
4	1	1	2	2	4	2	2	4	3
Q 11	Q12	Q13	Q14	Q15-	Q16	Q17	Q18	Q19	Q20
1	4	4	1	3	3	4	2	4	3
Q 21	Q22	Q23	Q24	Q25	Q26	Q27	Q28		
3	4	1	2	2	1	1	3		

QN. No.		CORRECTION(S)		
29	(a)	4 cm		
	(b)	Day 5		
	(c)	Water, oxygen and warmth		
30	(a)	cell wall and chloroplast		
	(b)	The single-celled organisms has chloroplast which contains chorophyll to trap light so that chloroplast of the organisms can make its own food.		
	(c)	To allow the cell substances to move within the cell.		
31	(a)	Blood flowing in X had more oxygen (and lesser oxygen) than in Y. Blood flowing in Y had more oxygen (and lesser carbon dioxide) than in X.		
	(b)	The folds will increase the surface area in contact with the water allowing the fish to absorb sufficient / enough dissolved oxygen.		
32	(a)	No.	Statement	Tick (✓) if correct
		1	Fertilisation takes place in P and S.	
		2	The reproductive cells will travel down P and R.	
		3	The male reproductive cells are found in Q and U.	✓
	4	P and T have the same function in its reproduction process.		
	(b)	Pollen grains		
(c)	Pollen grains can be stuck onto the stigma more easily.			
33	(a)	Have one ovule: X and Z	Have many ovules: W and Y	
	(b)	So that the flower can develop more seeds/ more seeds germinating and have a higher chance for the plant to reproduce and develop into adult plants, so as to have a higher chance of pollination.		
	(c)			
34	(a)	Gas (1)		
	(b)	Y can be compressed and only gas can be compressed. Thus Y is a gas.		
	(c)			

QN. No.		CORRECTION(S)	
35	(a)	Cut-out	Transparency
		A	opaque
		B	transparent
	(b)	No, as C is opaque such that the shadow can be formed on C, so no light will reach D.	
	(c)	Required Property of Light: Light travels in a straight line	
36	(a)	Y was in direct / closer contact with the heater, so Y gained heat faster from the heater than X. Thus, Y expanded more than X.	
	(b)	The inner wall was in direct / closer contact with the boiling water, so the inner wall gained heat faster from the boiling water and expanded faster than the outer wall.	
	(c)	Plastic / Rubber / Wood	
37	(a)	A battery	
	(b)	When two batteries are used, the magnetism for the electromagnet will be greater so the electromagnet will repel the bar magnet more with a greater force of repulsion.	
	(c)		
38	(a)	To ensure that the surface area of the strip in contact with the water is the same and there will only be one changed variable which is the material of the strip.	
	(b)	A is waterproof	
	(c)	So that it will be easier for him to see the watermark.	
39	(a)	When S1 is opened, none of the bulbs in the house can light up.	
	(b)	Complete the part of the circuit for the living room: 	
40	(a)	Evaporation is the process in which liquids gain heat from a heat source and changes into gas form.	
	(b)	In the car	
	(c)	The temperature of air in the car is warmer than air outside the car. So the warmer water vapour in the car touches the cooler inner glass window, lose heat and condenses to form water droplets on the inner part of the window.	
	(d)	The star will disappear. There is no cooler surface for condensation to occur. So the water droplets on the window will start to gain heat from the warmer air outside the car and evaporate to form water droplets thus the star disappear.	

CHIJ ST NICHOLAS GIRLS' SCHOOL WA2 PAPER

Section A (18 x 2 marks = 56 marks)

For each question from 1 to 18, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet provided.

1. Brittany conducted an experiment to find out how different temperatures can affect the growth of bacteria M. Her results are shown in the table below.

Temperature at which bacteria M is kept (°C)	Number of bacteria (unit)	
	At the start of experiment	48 hours later
30	1	150
40	1	300
50	1	200
60	1	80

Based on the results above, which one of the following statements about growth of bacteria M is true?

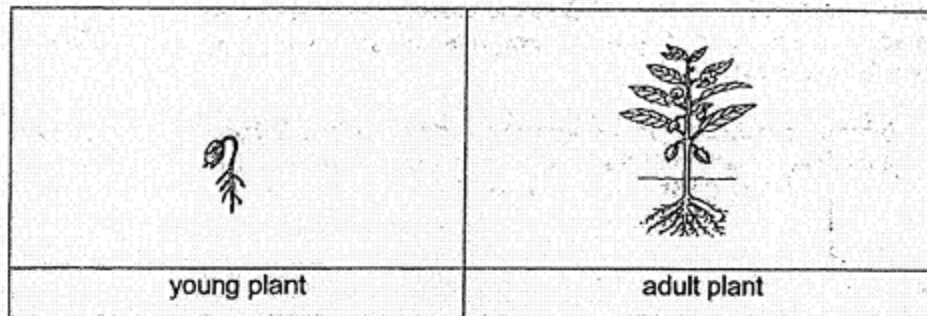
- (1) Bacteria grow best at cold temperatures.
 - (2) Bacteria grow best at high temperatures.
 - (3) Bacteria grow the best at temperatures between 35 °C to 40 °C.
 - (4) Bacteria is killed completely when the temperature reach 60 °C.
2. The table below shows the characteristics of animal W and animal X. A tick (✓) shows that the characteristic is present.

Animal	Number of legs				Method of Reproduction	
	0	2	4	6	Lay eggs	Gives birth to young alive
W			✓			✓
X	✓				✓	

Which of the following shows the likely outer body coverings of animal W and animal X?

	Animal W	Animal X
(1)	hair	scales
(2)	feathers	hair
(3)	moist skin	feathers
(4)	scales	moist skin

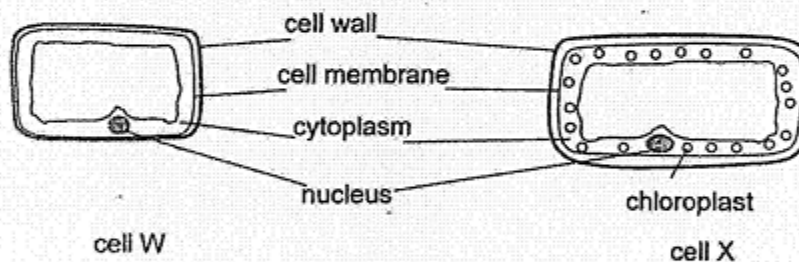
3. Study the diagram below.



What is the similarity between the young plant and the adult plant?

- (1) They can bear fruits.
- (2) They can make their own food.
- (3) They require air, warmth and water to survive.
- (4) They can absorb water and mineral salts through their roots.

4. Laura took two cells W and X from the same plant as shown in the diagrams below.



Which of the following correctly identifies the plant parts that Laura took cells W and X from?

	cell W	cell X
(1)	leaf	root
(2)	root	leaf
(3)	fruit	root
(4)	leaf	leaf

5. Which of the following shows the basic unit of life of a plant and a human?

	plant	human
(1)	cell	cell
(2)	cell wall	cell membrane
(3)	nucleus	nucleus
(4)	chloroplast	nucleus

6. Four friends made the following statements about the human circulatory system.

Amy: When we exercise, our heartbeat slows down.

Bale: The circulatory system needs to work together with the other body systems.

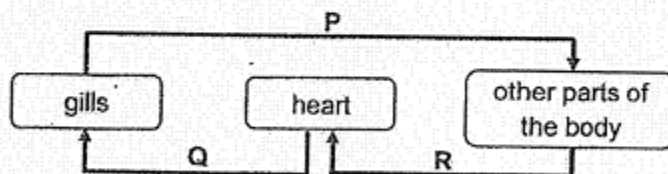
Cathy: Blood transports only oxygen and digested food to all parts of the body.

Drewy: The circulatory system is made up of the heart, blood and blood vessels.

Who have made the correct statements about the human circulatory system?

- (1) Amy and Bale only
- (2) Bale and Cathy only
- (3) Bale and Drewy only
- (4) Cathy and Drewy only

7. The diagram below shows the circulatory system of a fish. The arrows represent the flow of blood to the various parts of its body



The blood flowing in blood vessel Q has _____.

- (1) more oxygen than the blood in blood vessel R
- (2) more oxygen than the blood in blood vessel P
- (3) less carbon dioxide than the blood in blood vessel R
- (4) more carbon dioxide than the blood in blood vessel P

8. Suelyn carried out three different activities. She measured her pulse rate and her breathing rate for each activity that she carried out. The results were recorded in the table below.

Activity	Pulse rate (per minute)	Breathing rate (per minute)
X	130	80
Y	80	45
Z	140	95

Based on the results above, which of the following statements are true?

- A Activity Y requires the most amount of energy.
 - B More energy is needed in activity Z than in activity X.
 - C Higher pulse rate allows a higher gaseous exchange rate.
 - D Her pulse rate decreased but her breathing rate increased when she was exercising.
- (1) A and D only
 (2) B and C only
 (3) A, C and D only
 (4) B, C and D only

9. Megan measured the mass of four pieces of cloth made of different materials E, F, G and H. She then soaked the four pieces of cloth into a pail of water and measured their mass again. The results are shown in the table below.

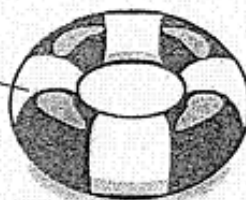
Material	Mass of materials (g)	
	Before soaking in water	After soaking in water
E	90	90
F	80	190
G	100	200
H	130	180

Based on the results above, which material E, F, G or H should she use to make a raincoat?

- (1) Material E
 (2) Material F
 (3) Material G
 (4) Material H

10. Leticia bought an inflatable swimming float as shown.

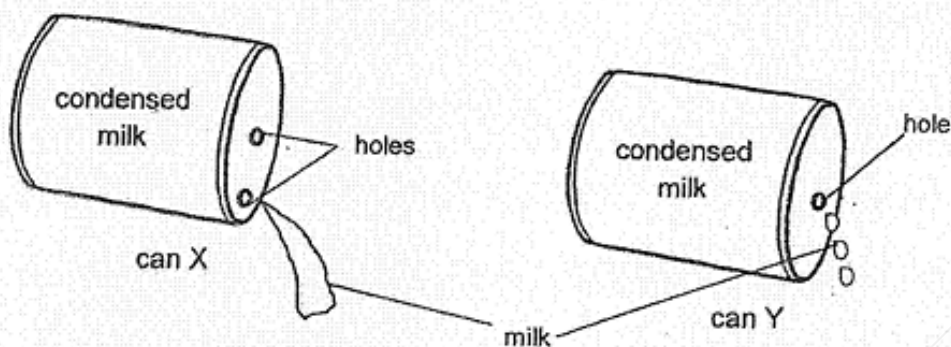
fully inflated
swimming float



When she blew more air into the float, she observed that the size of the float remained the same.

Which of the following best explains her observation?

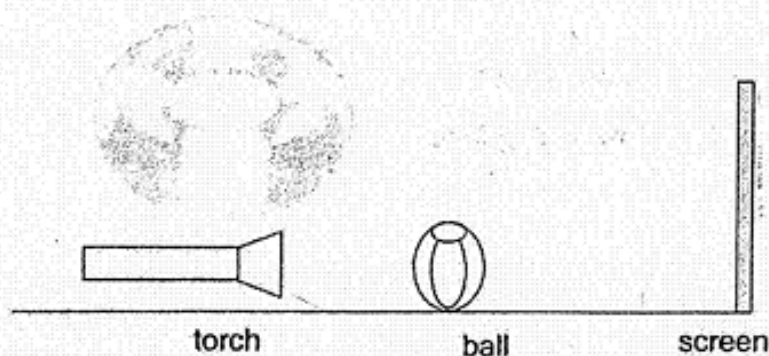
- (1) Air has mass.
 - (2) Air takes up space.
 - (3) Air can be compressed.
 - (4) Air has no definite shape.
11. Jiayi had two similar cans of condensed milk X and Y. She pierced two similar-sized holes in can X and only one in can Y. She tilted both cans to pour the milk out as shown in the diagram below.



Jiayi observed that the milk flowed out of can X more easily than from can Y. Which of the following best explains this observation?

- (1) Air is able to enter can X.
- (2) The hole in can Y is too small.
- (3) Air could not escape from can Y.
- (4) The milk in can X has expanded.

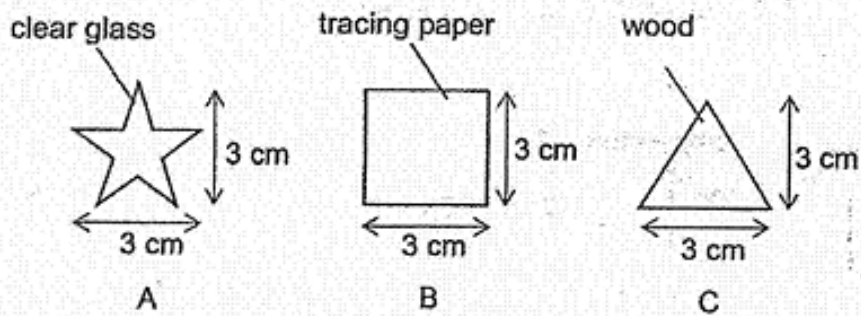
12. Marianne set up an experiment in a dark room. She shone a torch on a ball as shown in the diagram below. A shadow of the ball was cast on the screen.



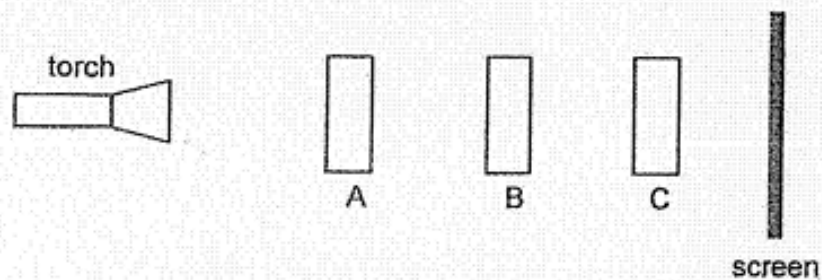
What could Marianne do to cast a bigger shadow on the screen?

- A Move the torch towards the ball.
 - B Move the screen towards the ball.
 - C Move the torch further away from the ball.
 - D Move the ball further away from the torch.
- (1) A only
 (2) B and C only
 (3) C and D only
 (4) B, C and D only

13. The diagram below shows three sheets of materials of different shapes.

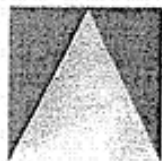


The three sheets of materials are arranged between a torch and a screen as shown below.



Which one of the following correctly shows the shadow formed on the screen?

(1)



(2)



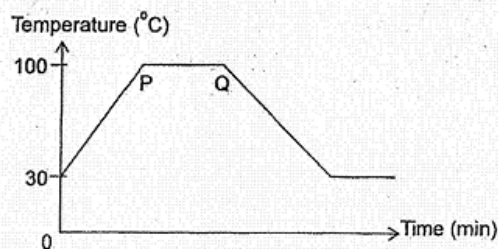
(3)



(4)



14. Benny heated some tap water until it boiled before allowing it to cool down. He recorded the temperature of the water at regular intervals. He then plotted a graph to show the changes in temperature of the water over time.

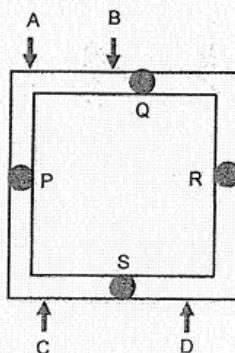


Which of the following statements about line PQ are true?

- A Heating has stopped.
- B The water was boiling
- C The water was still gaining heat from the flame.
- D The temperature of water was constant as it is losing heat to the surroundings.

- (1) A and B only
- (2) A and D only
- (3) B and C only
- (4) B, C and D only

15. The diagram below shows a square metal frame with four identical drops of wax attached at positions P, Q, R and S.



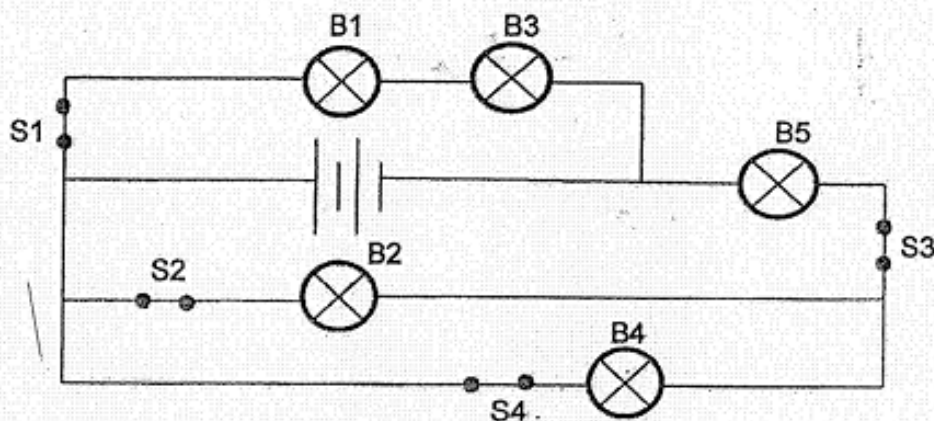
James heated the metal frame strongly at one of the points A, B, C or D. He recorded the time taken for the drops of wax to start melting in the table below.

Position of the drop of wax	Time taken for the wax to start melting (s)
P	25
Q	30
R	20
S	8

At which point A, B, C or D did James heat the square metal frame?

- (1) A
- (2) B
- (3) C
- (4) D

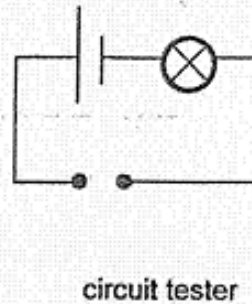
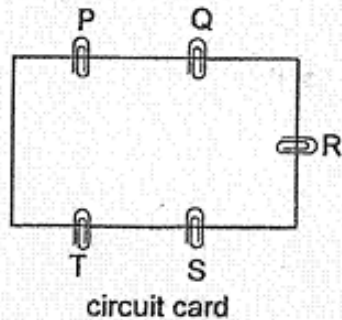
16. Karen set up a circuit with the switches S1, S2, S3 and S4 as shown below. All the five bulbs were lit when all four switches were closed.



Karen wanted to have the least number of bulbs lit when one of the switch is opened. Which switch should Karen open?

- (1) S1
- (2) S2
- (3) S3
- (4) S4

17. The diagram below shows a circuit card and a circuit tester.

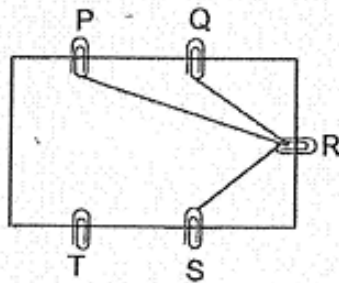


The table below shows what happens to the bulb when the circuit tester is connected to the circuit card.

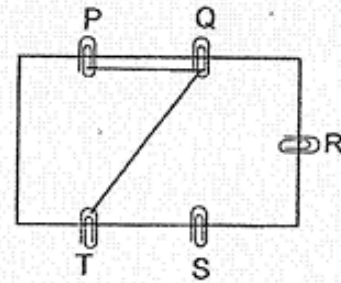
Points connected to the circuit tester	Did the bulb light up?
P and S	yes
Q and P	no
R and T	yes
S and Q	no

Based on the results above, which of the following shows the correct arrangement of the wires on the circuit card?

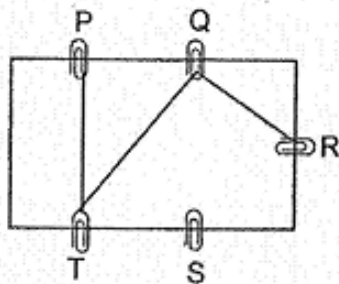
(1)



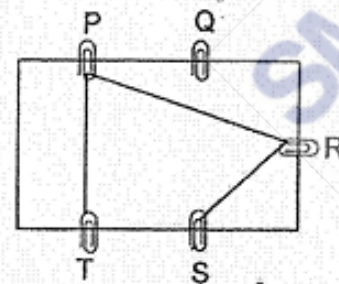
(2)



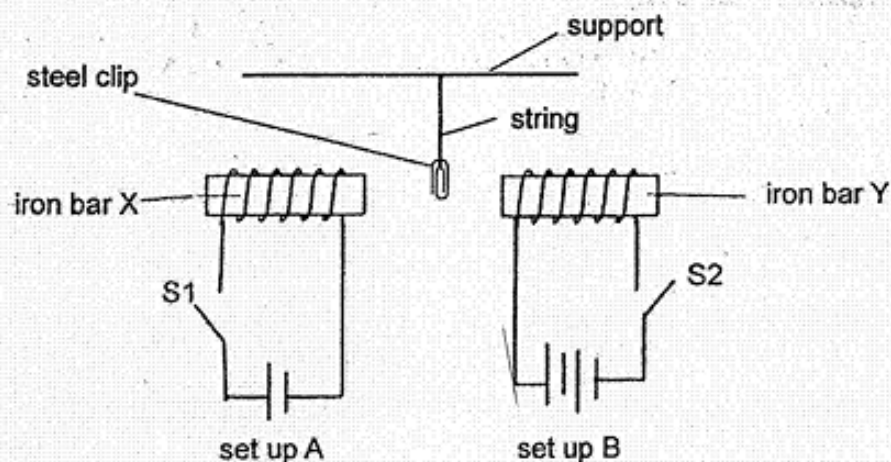
(3)



(4)



18. Jenny placed a steel clip between two set-ups A and B as shown in the diagram below.



Jenny closed switches S1 and S2 at the same time, which one of the following observations would she make?

The steel clip would _____.

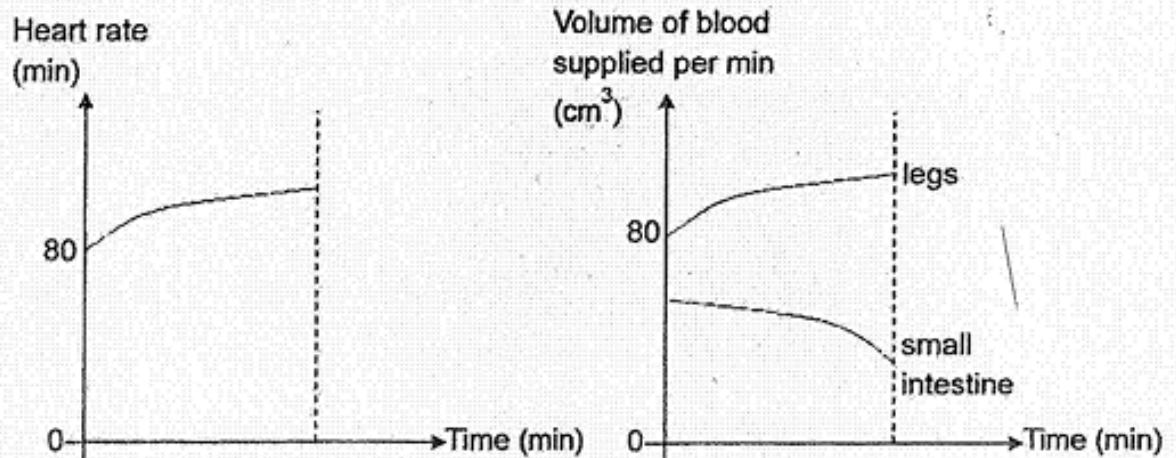
- (1) be attracted to the iron bar X
- (2) be attracted to the iron bar Y
- (3) remain in its original position
- (4) be attracted to the iron bar Y and then to the iron bar X

Section B (14 marks)

For questions 19 to 23, write your answers in this booklet.

The number of marks available is shown in the brackets [] at the end of each question or part question.

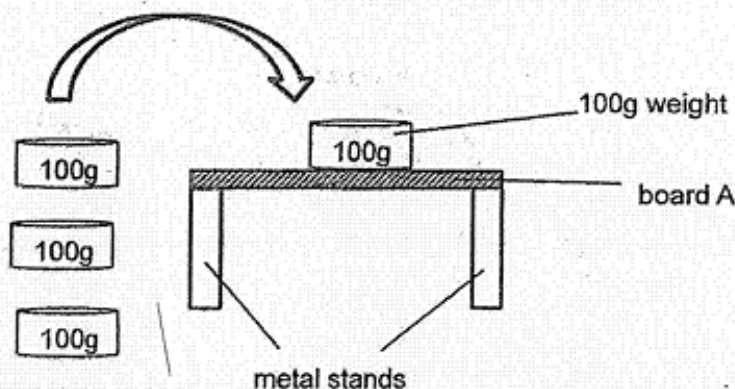
19. The graphs below show how Jane's heart rate and volume of blood supplied to two parts of her body changed over time as she was exercising.



- (a) Jane observed that both her heart rate and volume of blood supplied to her legs [2] increased over time. Based on the graph above, explain this observation.

- (b) Jane's mother advises her that she should not eat right before she exercises. Based [1] on the results above, explain why her mother said so.

20. Benny carried out an experiment with board A as shown below. He added a 100g weight on board A and continue to add more 100g weights until it breaks. He then recorded the number of 100g weights ~~board A could hold.~~
board



Benny repeated the experiment with 2 other boards B and C of different materials. The results are shown in the table below.

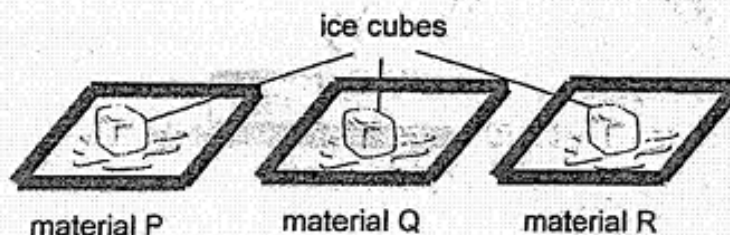
Board	Number of 100g weights needed to break the board
A	3
B	5
C	7

- (a) Which of the following variables are kept the same in his experiment? Put a tick (✓) beside the variable(s). [1]

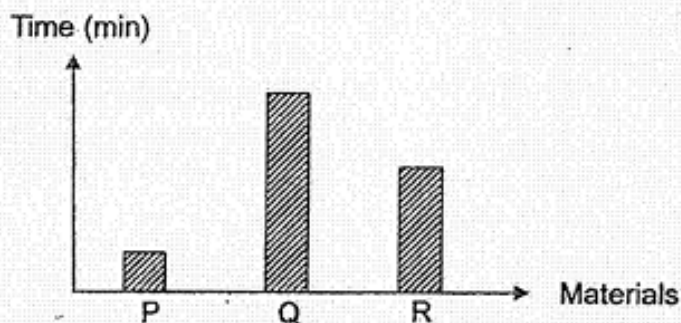
Variable	Kept the same
Length of each board	
Number of 100g weights	
Position of metal stands	
Type of materials the board are made of	
Position where the 100g weights are placed on the boards	

- (b) What can Benny do to check if the results of his experiment are reliable? [1]

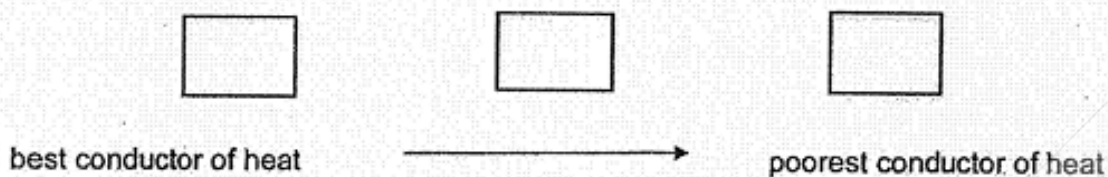
21. Linda placed three similar ice cubes on three different materials P, Q and R as shown below. The materials were of the similar size.



She measured the time taken for the ice cubes to melt completely when placed on the materials. She then recorded the results in a bar graph as shown below.

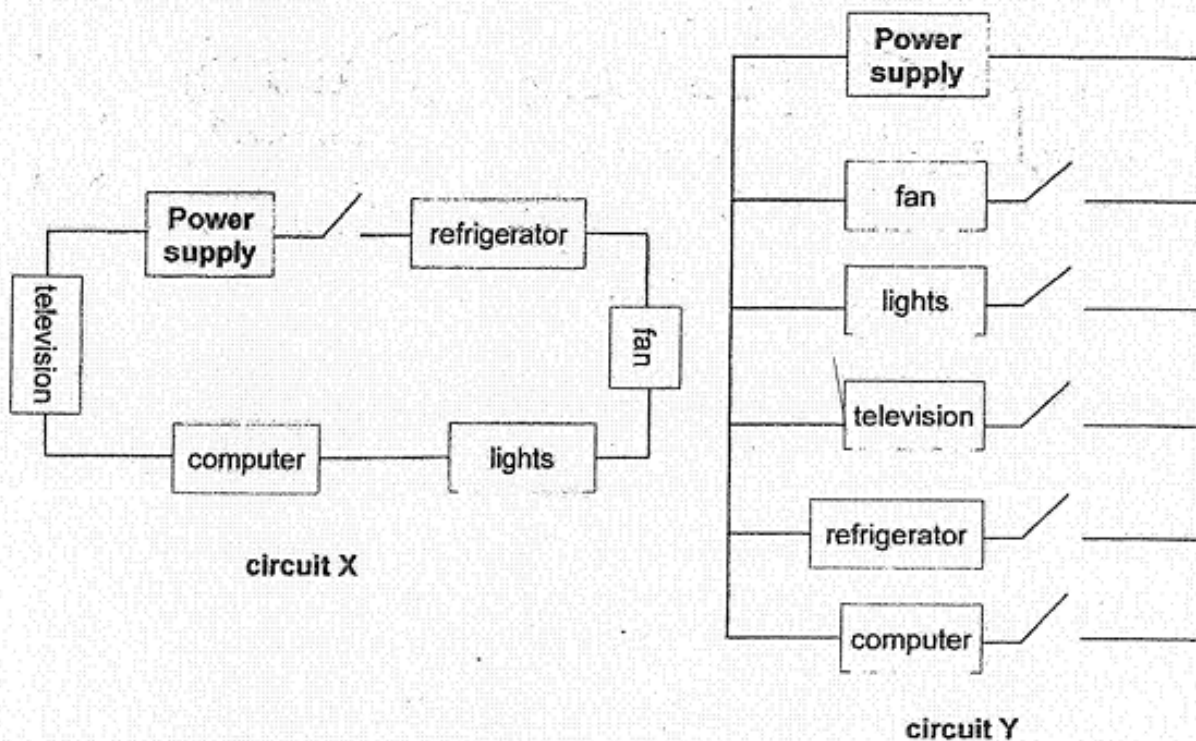


- (a) Arrange the materials according to their heat conductivity from the best conductor of heat to the poorest conductor of heat. [1]



- (b) Linda wants to use a tray to quickly defrost the fish that she took out from the freezer. [2]
 Based on her experiment, which material P, Q or R should she use to make the tray?
 Explain your answer.

22. Electrical supply to our homes comes from a power station. The diagram below shows two electric circuits X and Y connecting different electrical appliances to the power supply.



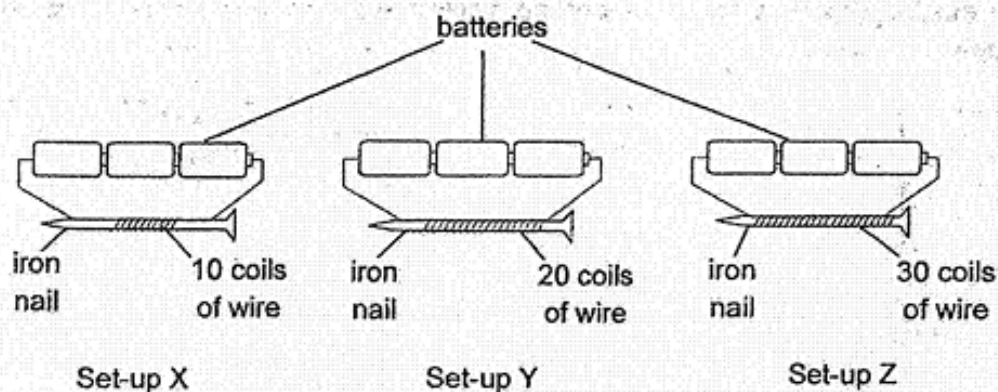
- (a) State how the electrical appliances are connected to each other in circuits X and Y. [1]

Circuit X: _____

Circuit Y: _____

- (b) Which circuit X or Y, best represents the circuit connection in a typical home? Explain your answer [2]

23. Study the diagram below.



(a) Give a reason why the iron nail is suitable for use in the set-ups above. [1]

(b) Give a reason why the number of batteries must be the same in all three set-ups. [1]

(c) Wayne wanted to find out if the number of batteries will affect the strength of the electromagnet. What two changes should he made to the set-ups above? [1]

(i) Change 1:

(ii) Change 2:

ANSWER SHEET

Booklet A

Q1	3	Q2	1	Q3	4	Q4	2	Q5	1
Q6	3	Q7	4	Q8	2	Q9	1	Q10	3
Q11	1	Q12	1	Q13	4	Q14	3	Q15	4
Q16	3	Q17	4	Q18	2				

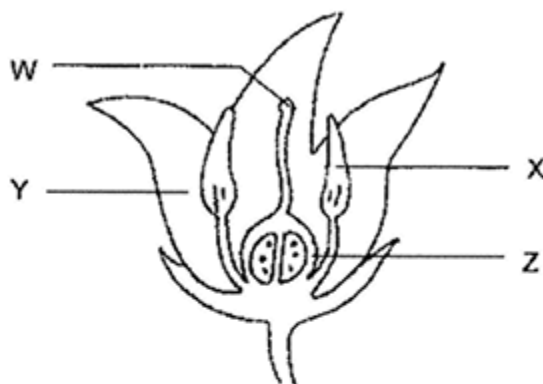
Booklet B

Q19	<p>(a) Jane could have performed a vigorous activity. When she exercises, her body needs more energy. So her heart will best faster to pump more blood containing more digested food, oxygen and water faster for more respiration.</p> <p>(b) There is lesser amount of blood supplied to the small intestine when she exercises so lesser amount of digested food will be absorbed into the bloodstream.</p>
Q20	<p>(a) Tick : Length of each board Position metal stands Position where the 100g weights are placed on the boards</p> <p>(b) He can repeat the experiment a few more times and calculate the average of the results.</p>
Q21	<p>(a) P → R → Q</p> <p>(b) P. On tray P, the ice cubes took the shortest time to melt which shows that P is the best heat conductor hence the frozen fish will gain the most heat the fastest from tray P so, the frozen fish will defrost the fastest on P.</p>
Q22	<p>(a) Circuit X : connected in series Circuit Y : connected in parallel</p> <p>(b) Y. When one of the electrical appliances is faulty, the other appliances can still work as electricity can still flow through the other parts of the circuits. Also there are individual switches controlling each appliance thus we can save electricity as not all appliances will be switched on at the same time.</p>

Q23	<p>(a) Iron is a magnetic material and can be magnetised into a temporary magnet.</p> <p>(b) To ensure that there will be only one changed variable which is the number of coils of wire around the iron nail so that the test is fair.</p> <p>(c) (i) Change 1 : Use the same number of coils of wire around the iron nail for all 3 set-ups.</p> <p>(ii) Change 2 : Use a different number of batteries in each set-up.</p>
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TAO NAN SCHOOL EOY PAPER

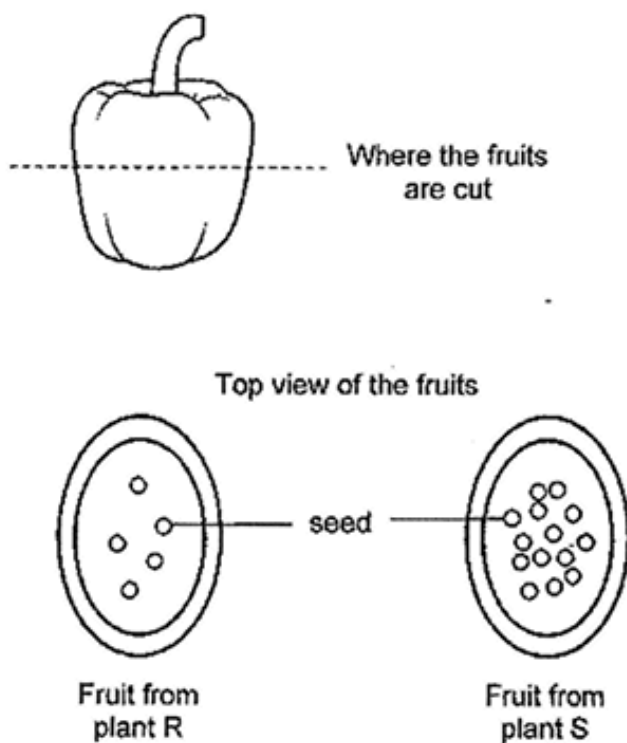
1. Study the diagram below carefully.



Which part of the flower produces pollen grains?

- (1) W
 - (2) X
 - (3) Y
 - (4) Z
2. Which of the following statements about sexual reproduction in humans is correct?
- (1) The egg is produced in the testis.
 - (2) The sperm is produced in the womb
 - (3) The fertilised egg develops in the ovary
 - (4) The baby develops from a fertilised egg.

3. Gregory cut two similar type of fruits into halves as shown below. He noticed that the fruit of plant S had more seeds than the fruit of plant R.

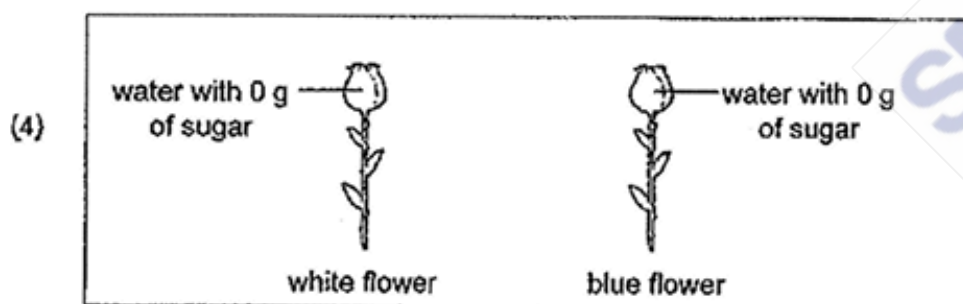
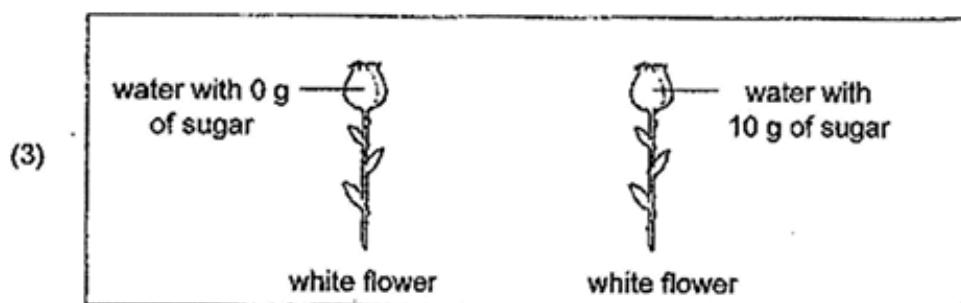
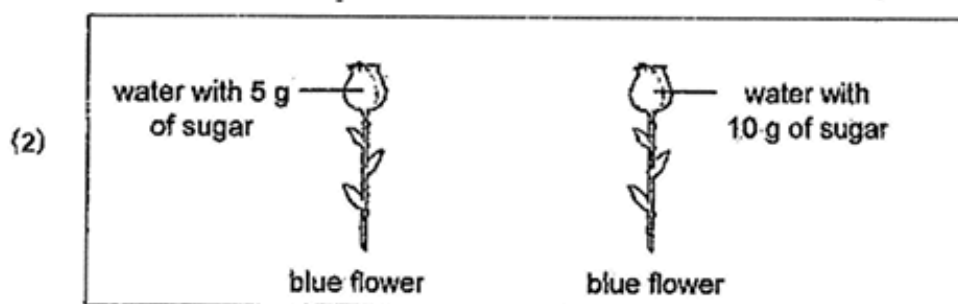
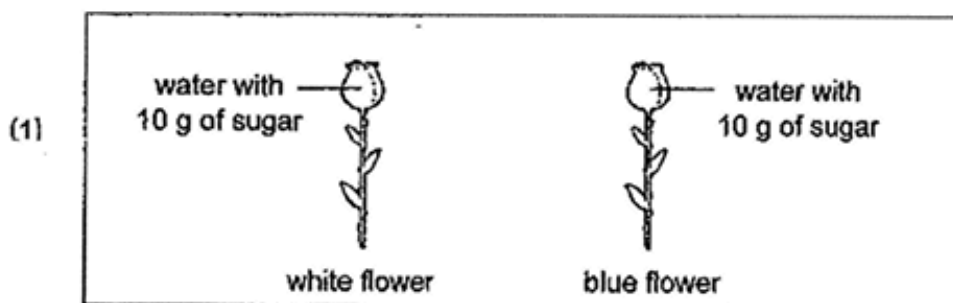


Based on Gregory's observation, which of the following can be concluded?

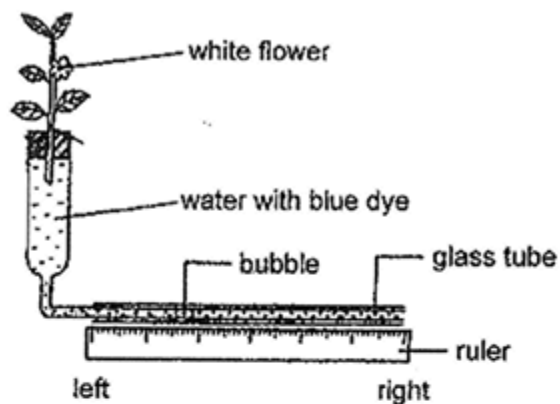
- (1) The flower of plant R had fewer ovules than the flower of plant S.
- (2) The flower of plant R had a smaller ovary than the flower of plant S.
- (3) The flower of plant R was less brightly-coloured than the flower of plant S.
- (4) The flower of plant R produced fewer pollen grains than the flower of plant S.

4. Faith wanted to investigate if more butterflies are attracted to sugar solution. She made flowers using blue or white coloured paper. She then coated each of them with a solution of 10 ml of water mixed with different amounts of sugar.

Which of the following set-ups should she use for her experiment?



5. Study the set-up below.



Which of the following will be observed after a few days?

- ☐ A The flower will turn blue.
- ☒ B The flower will remain white.
- ☐ C The air bubble will move to the left.
- ☐ D The air bubble will move to the right.

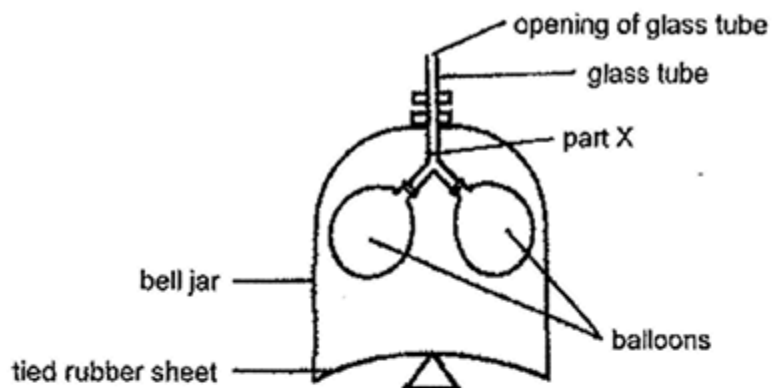
- (1) A only
- (2) A and C only
- (3) A and D only
- (4) B and C only

6. Animal X is large and fierce. When mated with Animal Y, which is small and timid, their offspring are large and fierce.

Which of the following best explains why this was observed?

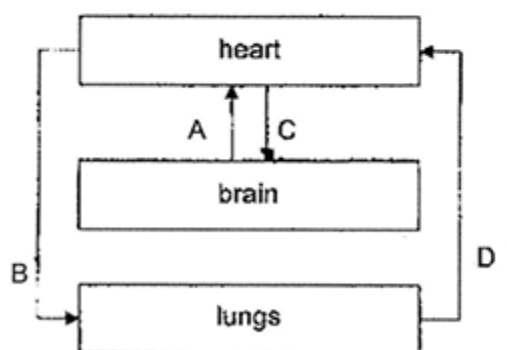
- (1) Animal X is larger than Animal Y.
- (2) The parents of the offspring are both fierce.
- (3) Their offspring inherited only Animal Y's traits.
- (4) The traits of Animal X are passed on to their offspring.

7. The following diagram shows a model of the human respiratory system.



Which part of the respiratory system does part X of the glass tube represent?

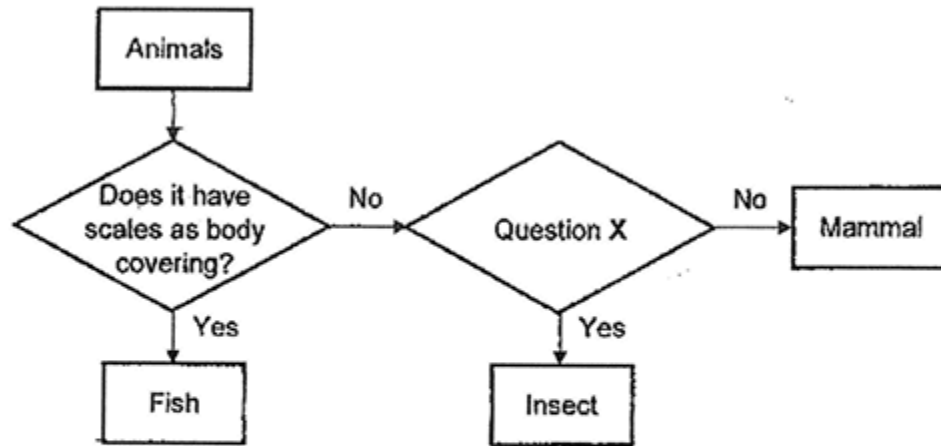
- (1) Lungs
 - (2) Mouth
 - (3) Gullet
 - (4) Windpipe
8. The diagram below shows the human circulatory system.



Which of the arrows above shows the flow of oxygen-rich blood?

- (1) A and B only
- (2) A and C only
- (3) B and D only
- (4) C and D only

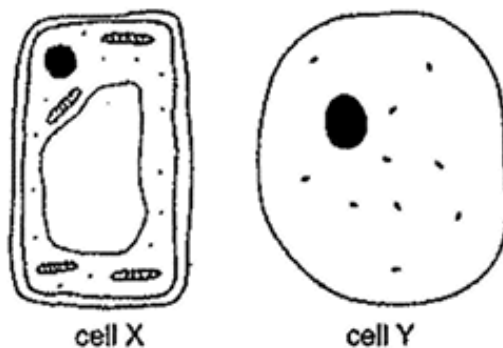
9. Study the flowchart below.



Which of the following can Question X be in the flowchart above?

- (1) Does it lay eggs?
- (2) Does it have a beak?
- (3) Does it have 3 body parts?
- (4) Does it have a pair of wings?

Study the two cells shown below to answer questions 10 and 11.

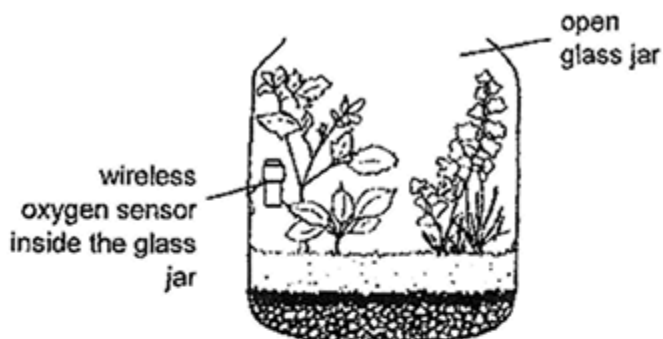


10. Which of the following statements is true about cells X and Y?
- (1) Both cells have a cell wall.
 - (2) Only cell Y contains genetic information.
 - (3) Cell X has cytoplasm while cell Y does not.
 - (4) Cell X is a plant cell while cell Y is an animal cell.
11. Ahmad knows that when cells are placed in water, water will enter the cells. He then placed cells X and Y in water and observed them under the microscope.
- Which of the following will happen to cells X and Y?

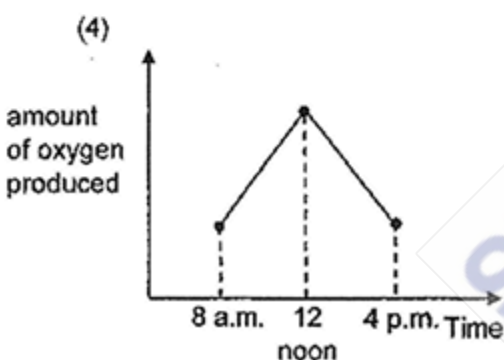
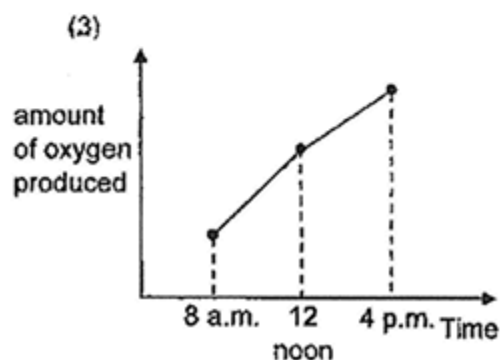
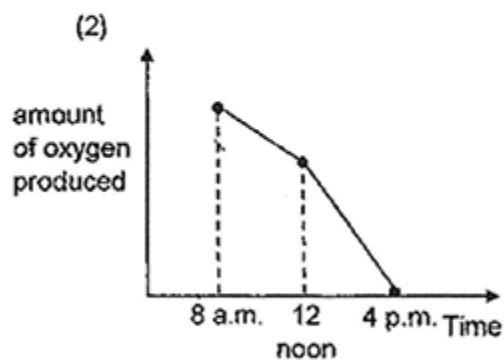
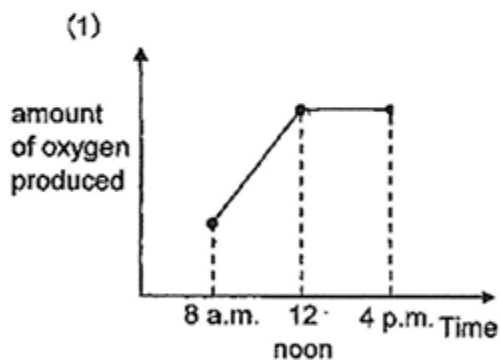
	cell X	cell Y
(1)	burst	burst
(2)	burst	did not burst
(3)	did not burst	burst
(4)	did not burst	did not burst



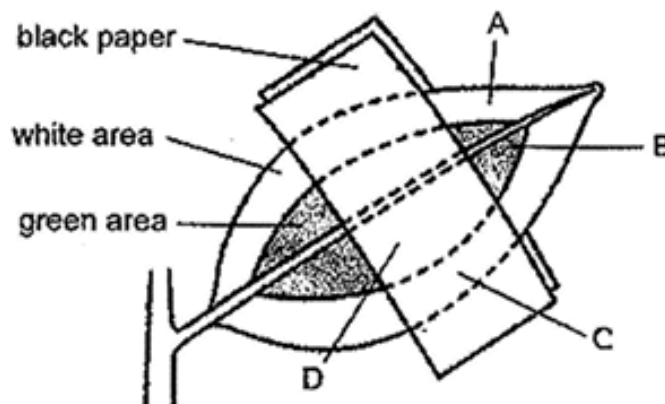
12. Study the diagram below.



The above jar was placed in an open field. Which of the following graphs shows the oxygen produced by the plants in the jar on a sunny day at 8 a.m., 12 noon and 4 p.m.?



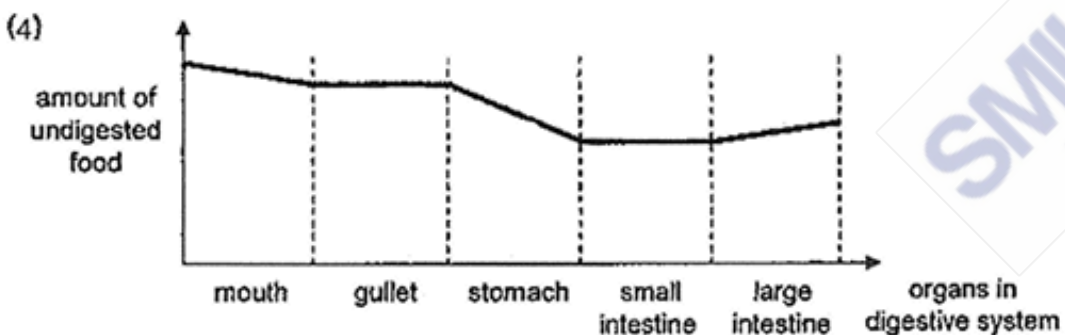
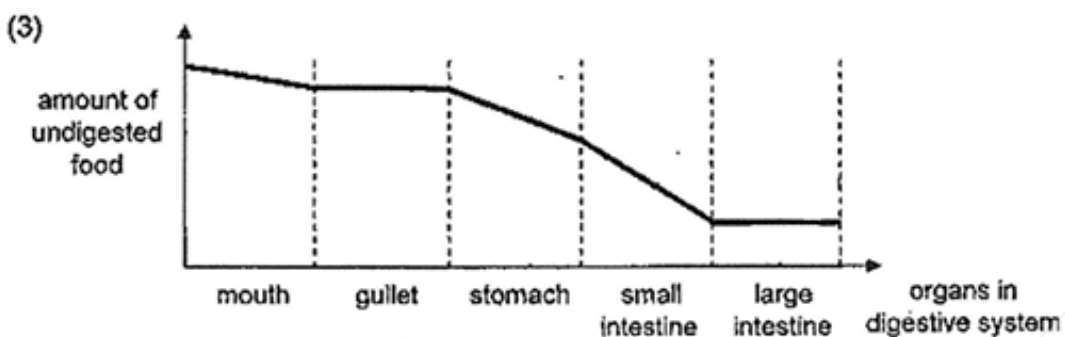
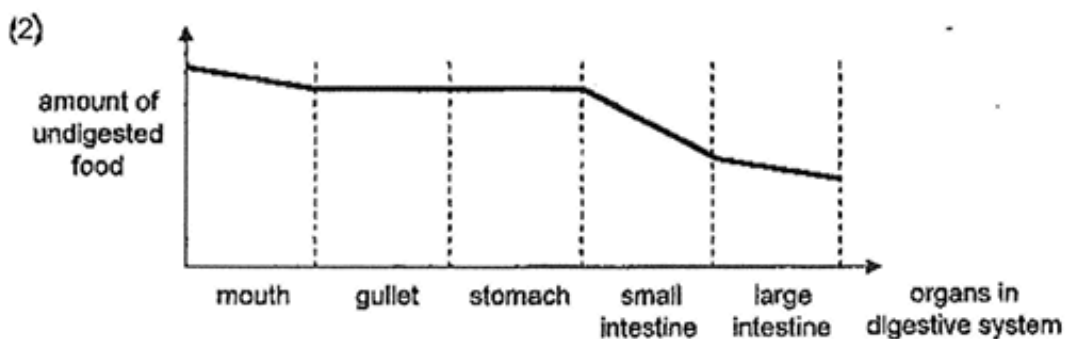
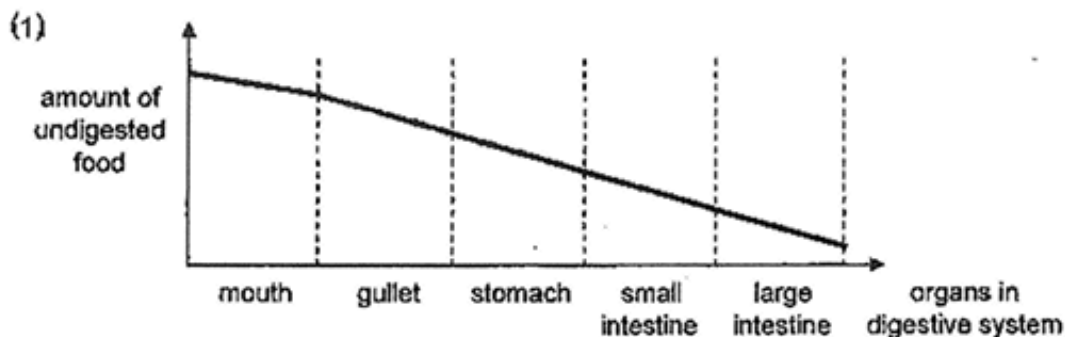
13. Wendy placed two pieces of black paper on a leaf of a plant as shown below. The plant was placed in a cupboard for 48 hours before it was placed outdoors on a sunny day for six hours. Then, the black papers were removed and parts A, B, C and D were tested with iodine solution. Wendy's teacher told her that the iodine solution turns dark blue when starch is present.



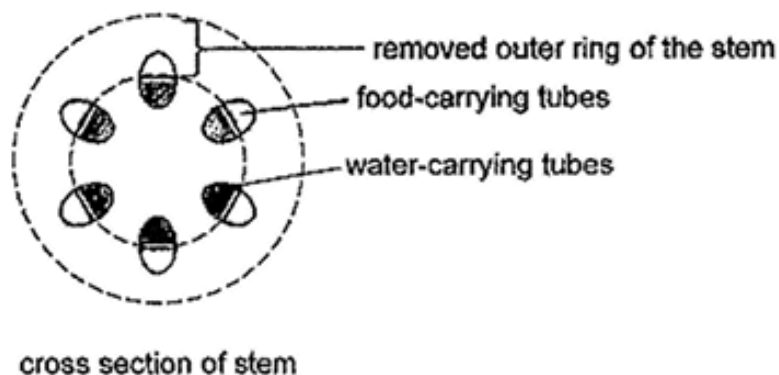
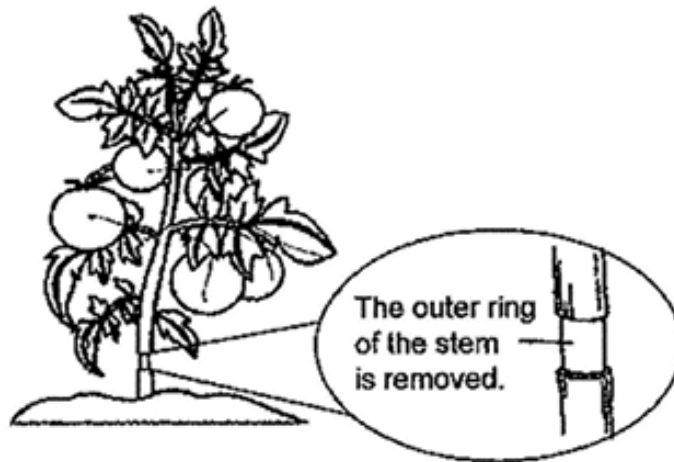
Which of the part(s), A, B, C or D, will cause the iodine solution to turn dark blue?

- (1) A
- (2) B
- (3) C
- (4) D

14. Jack ate a hamburger for lunch. Which of the graphs below shows how the amount of undigested food changes as it travels through the human digestive system?



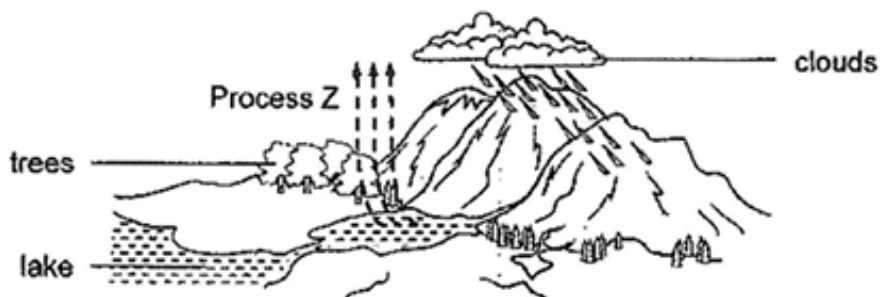
15. Some farmers remove the outer ring of the stem of fruit trees to produce larger fruits.



How does this action help the plants produce bigger fruits?

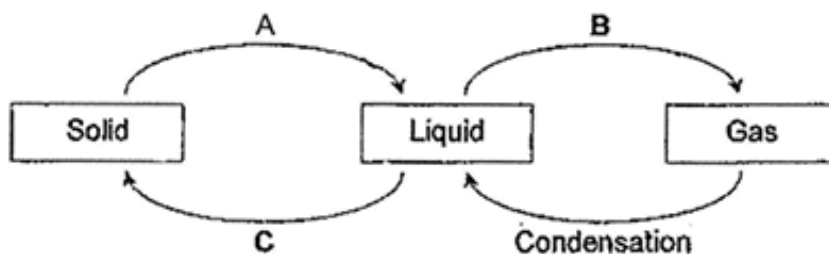
- (1) More water is transported from the leaves to the fruits.
- (2) More food is produced by the leaves after the stem is cut.
- (3) Food made is transported to the fruits instead of the roots.
- (4) Less water escapes from the leaves hence more food can be made.

16. Study the diagram of the water cycle below carefully.



What is process Z?

- (1) Melting
 - (2) Freezing
 - (3) Evaporation
 - (4) Condensation
17. The diagram below shows the processes A, B and C during the changes of states of water.



What processes do the arrows A, B and C represent?

	A	B	C
(1)	freezing	boiling	melting
(2)	melting	boiling	freezing
(3)	evaporation	melting	freezing
(4)	melting	evaporation	boiling

18. The table below shows the freezing and boiling points of substance D.

Substance	Freezing point / °C	Boiling point / °C
D	17	290

Which of the following correctly shows the correct states of substance D at 10°C and 250°C?

State of substance D at		
	10°C	250°C
(1)	solid	gas
(2)	solid	liquid
(3)	liquid	liquid
(4)	liquid	gas

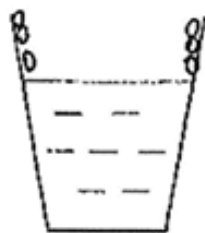
19. Calvin could not open the metal lid of a jar after it was removed from the fridge. He placed only the metal lid in a basin of water as shown below.



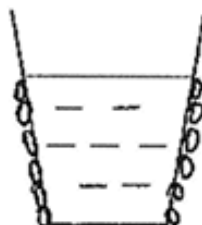
Which of the following shows the correct temperature of water in the basin and the explanation of why he was able to open the lid after some time?

	Temperature of water	Explanation
(1)	10°C	The metal lid lost heat to the water and expanded.
(2)	10°C	The metal lid lost heat to the water and contracted.
(3)	80°C	The metal lid gained heat faster from the water than the glass jar and expanded more.
(4)	80°C	The metal lid gained heat slower from the water than the glass jar and contracted less.

20. Howard carried out an experiment using two cups of water, P and Q, as shown below. The cups were left on the same table at a room temperature of 30°C for three minutes.



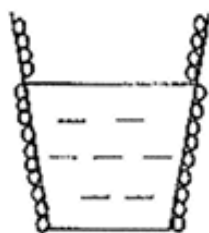
100 ml of water
in cup P (80°C)



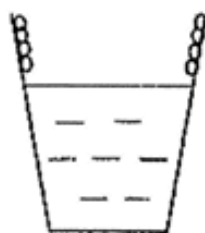
100 ml of water
in cup Q (10°C)

Which of the following correctly shows where the water droplets were formed on the cups P and Q after three minutes?

(1)

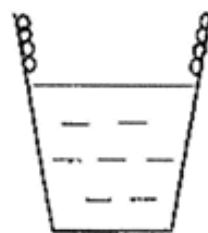


cup P

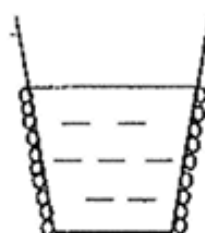


cup Q

(2)



cup P

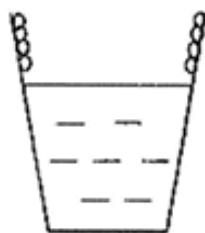


cup Q

(3)

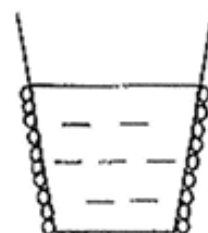


cup P

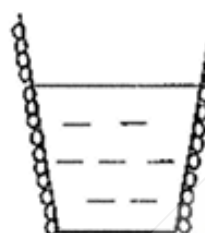


cup Q

(4)

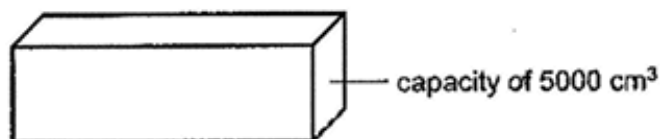


cup P



cup Q

21. The tank below has a capacity of 5000 cm^3 .

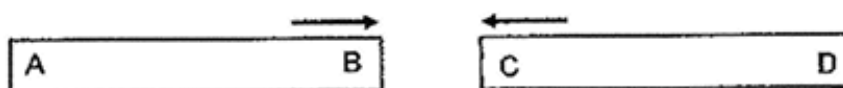


Which of the following can be completely stored in this tank?

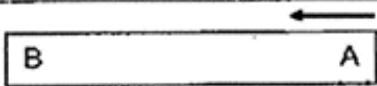
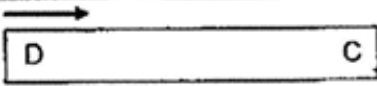

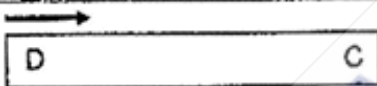
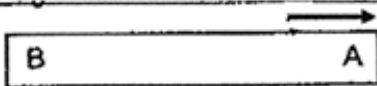
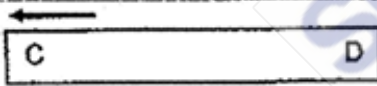
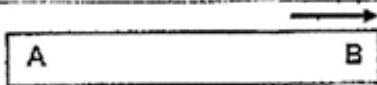
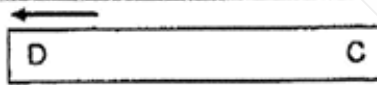
- A 4000 cm^3 of oxygen
- B 6000 cm^3 of carbon dioxide
- C 6000 cm^3 of water

- (1) A and B only
- (2) A and C only
- (3) B and C only
- (4) A, B and C




22. The following observation was made when Helen placed the ends, B and C, of two magnets near each other as shown below. The arrows indicate the movement of the magnets.



Which one of the following observations is possible if the magnets is/are flipped over?

(1)		
(2)		
(3)		
(4)		

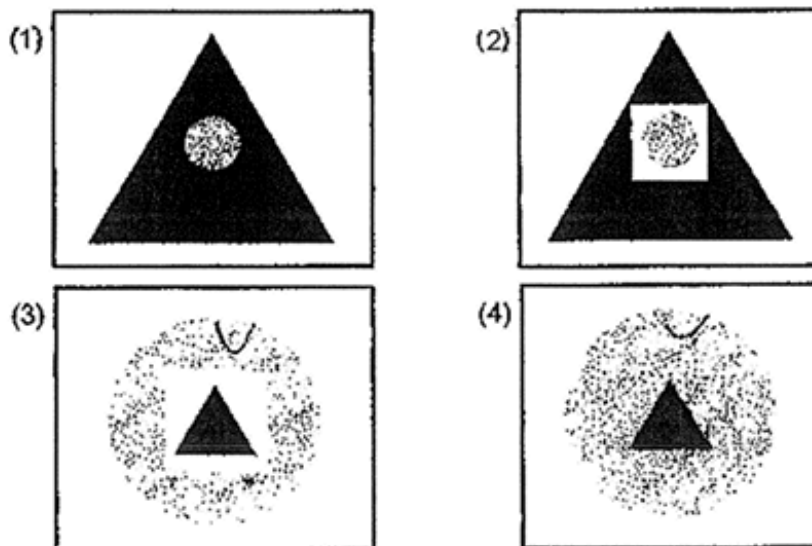
23. Xiao Li has 3 cut-outs which were made of different materials, P, Q and R, but of the same height.

	Shape	Material
P		frosted glass
Q		clear plastic
R		cardboard

She placed them in a straight line as shown below.



Which one of the following shadows could be seen on the screen?



24. Which of the following is a natural source of electricity?

(1)



battery

(2)



electric eel

(3)



candle

(4)

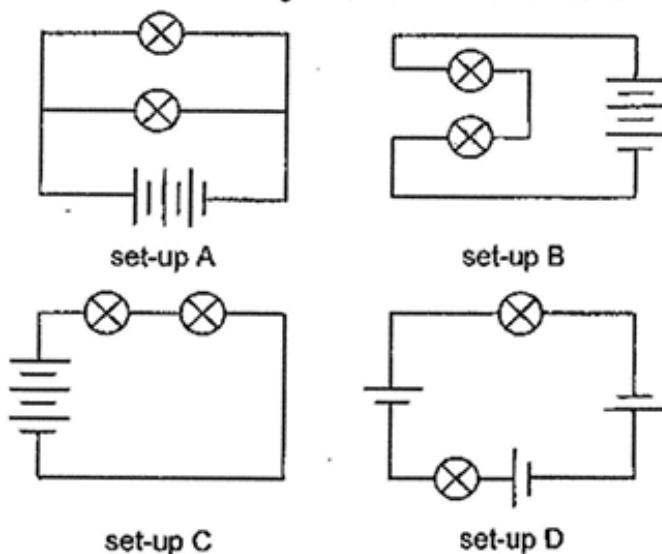


light bulb

25. Which of the following actions does not help to conserve electricity?

- (1) Use energy-saving bulbs.
- (2) Turn off the fan when not in use.
- (3) Adjust the air-conditioner to a lower temperature.
- (4) Switch the television to standby mode instead of leaving it turned on.

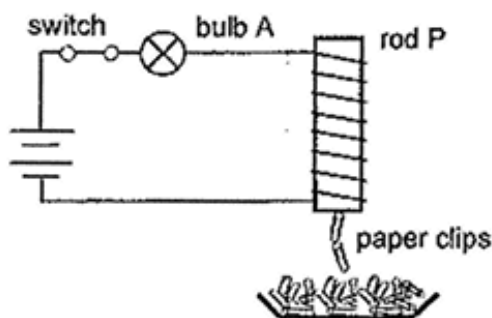
26. Jacob connected four circuits using similar bulbs and batteries.



If a bulb fuses, in which of the above circuits, will the other bulb remain lit?

- (1) A
- (2) B
- (3) C
- (4) D

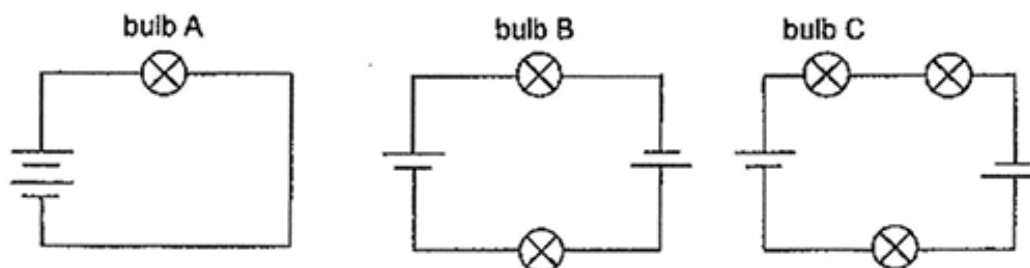
27. Caii set up the circuit below.



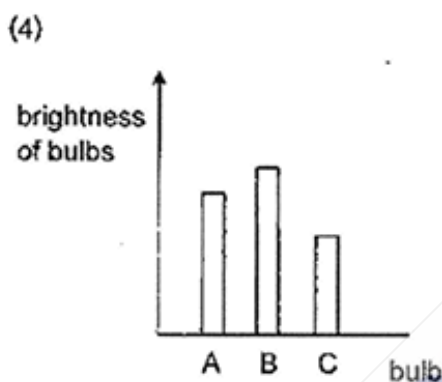
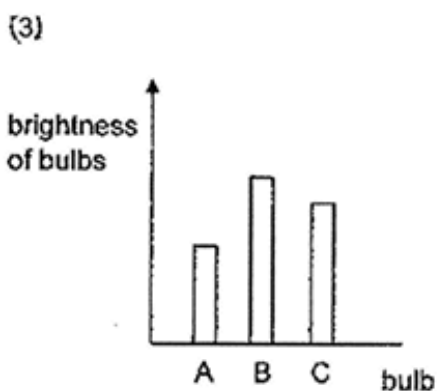
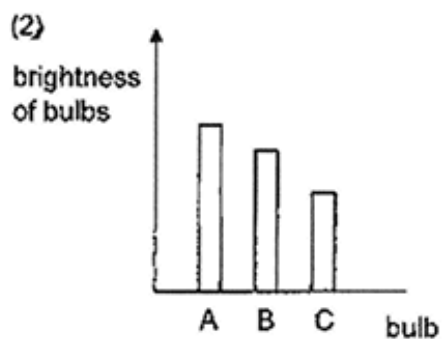
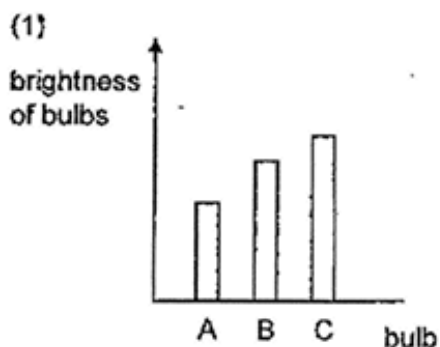
What can she do to increase the number of paper clips attracted by rod P?

- (1) Change rod P to a plastic rod.
- (2) Remove bulb A from the circuit.
- (3) Add another bulb in series with bulb A.
- (4) Reduce the number of coils of wire around rod P.

28. Elaine carried out an experiment with similar bulbs and batteries to find out how the number of bulbs added in series will affect the brightness of the bulbs.



Which of the graphs below correctly shows the brightness of the bulbs, A, B and C?



End of Booklet A

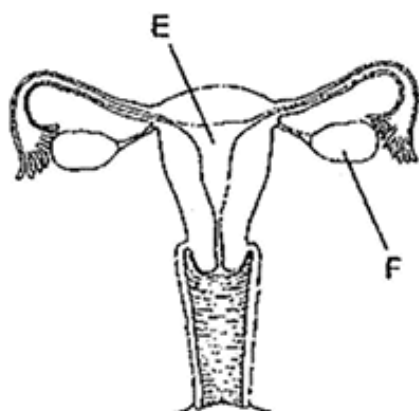
Booklet B (44 marks)

For questions 29 to 41, write your answers clearly in this booklet.

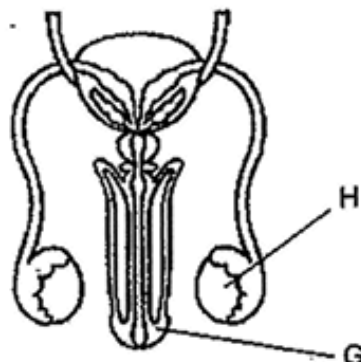
The number of marks available is shown in brackets [] at the end of each question or part question.

(44 marks)

29. The diagrams below show the female and male reproductive systems of a human.



female reproductive system



male reproductive system

(a). Identify the following.

[2]

Part E: _____

Part F: _____

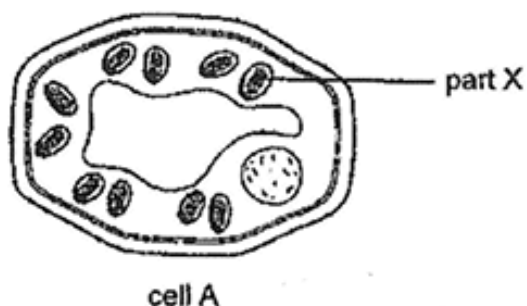
Part G: _____

Part H: _____

(b) State the main function of part F.

[1]

30. Andy studied cell A under a microscope.



(a) Identify part X. [1]

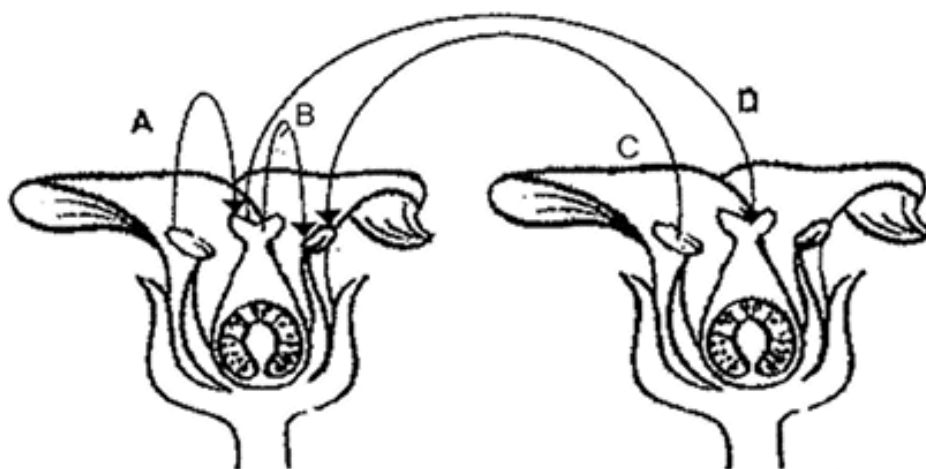
(b) How does cell part X help the plant to grow? [1]

He studied another cell, cell B, as shown below.



(c) Andy has taken cell A and B from the same plant. Identify which cell, A or B, was taken from the roots. Explain your answer. [1]

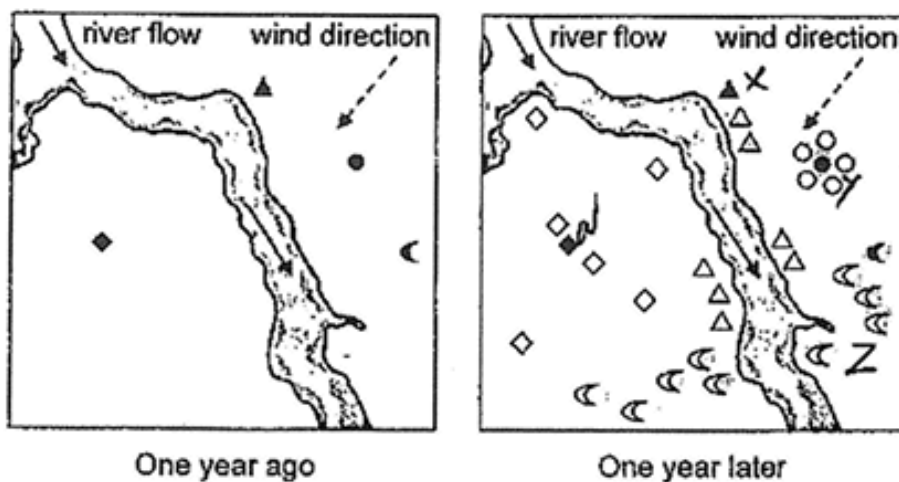
31. The diagram below shows two flowers of plant F.



- (a) Based on the diagrams above, which arrow(s), A, B, C or D, show(s) the process of pollination? [1]

- (b) Dominic thinks that the flowers of plant F are pollinated by insects. Based on the diagrams above, state one characteristic of the flowers that has helped him infer this. [1]

- (c) Nancy planted four different types of plants, W, X, Y and Z. After a year, she found more young plants and recorded their positions as shown below.



	W	X	Y	Z
Parent plant	◆	▲	●	☾
Young plant	◇	△	○	☾

- Based on the two diagrams above, suggest the likely fruit/seed dispersal methods for plants W, X, Y and Z. [2]

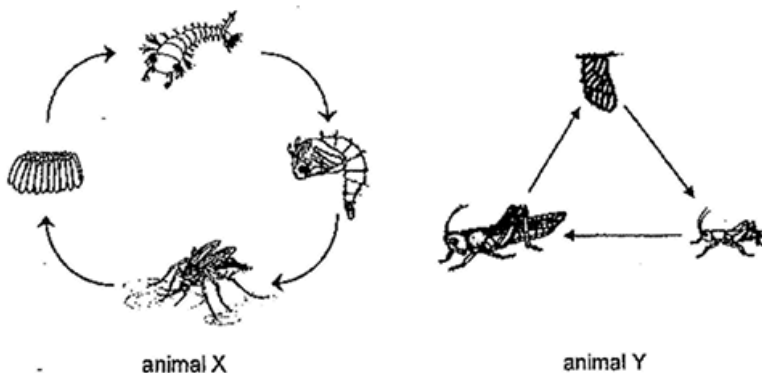
Plant W: _____

Plant X: _____

Plant Y: _____

Plant Z: _____

32. Study the life cycles of animals, X and Y, below.



(a) State one difference between the life cycles of animal X and animal Y. [1]

(b) Based on the life cycle of animal X above, suggest a reason why it is easier to get rid of animal X at the pupal stage than at the adult stage. [1]

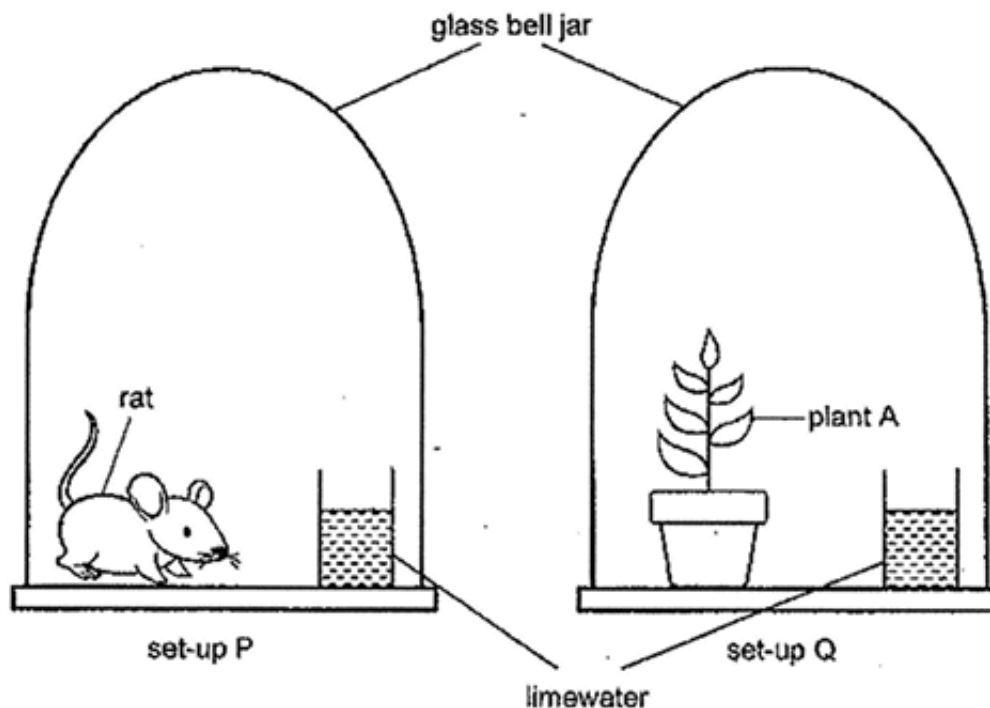
Macy kept some mosquitoes at different surrounding temperatures and recorded the number of days these mosquitoes remained in each stage of the life cycle.

The results are recorded in the table below.

Surrounding Temperature (°C)	Number of days in each stage		
	Egg	Larva	Pupa
24	2	12	3
25	2	10	3
26	2	7	3

(c) Based on the table above, what is the relationship between the surrounding temperature and the number of days the mosquito eggs take to reach their adult stage after hatching? [1]

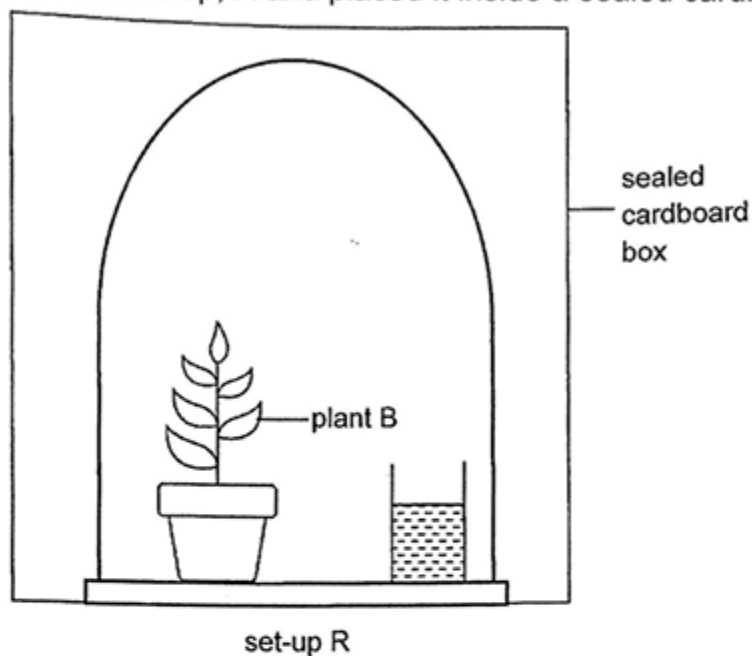
33. Jane prepared two similar set-ups, P and Q, as shown in the diagram below. Both set-ups were placed in a brightly-lit room. Limewater turns chalky in the presence of carbon dioxide.



She noticed that the limewater in set-up Q was less chalky than set-up P after an hour.

- (a) Explain why the limewater in set-up Q was less chalky. [2]

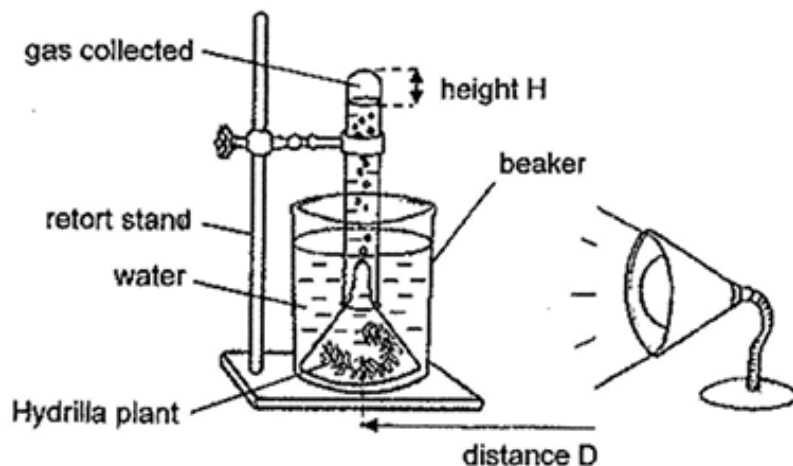
Jane prepared another set-up, R and placed it inside a sealed cardboard box.



- (b) After an hour, what is the difference in the observation of the limewater in set-up R compared to that in set-up Q? [1]

- (c) Explain the difference in the observations of the limewater between the two set-ups, Q and R [2]

34. An experiment on photosynthesis was carried out in a dark room using the set-up shown below.



The experiment was repeated with different distances, D , between the lit lamp and the plant. Each time, the height of the gas collected in the test tube, H , was recorded after 30 minutes.

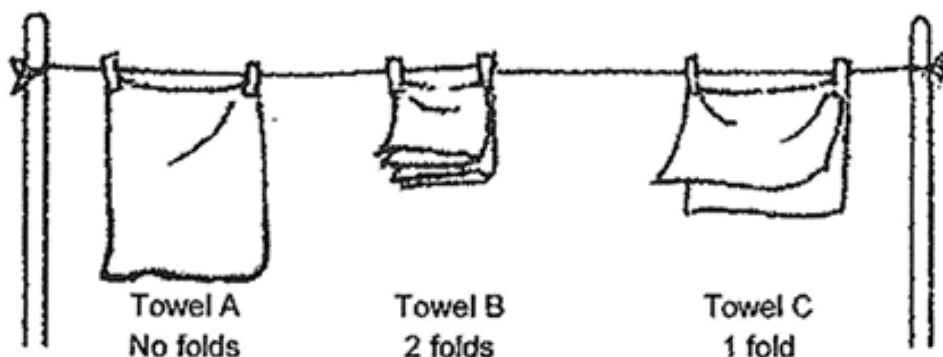
Distance D (cm)	10	12	14	16
Height H (cm)	1.9	?	1.2	1.0

- (a) Describe the process of photosynthesis. [1]

- (b) Based on the readings above, what is a possible value of H when the distance D is 12 cm? [1]

- (c) Explain your answer in (a), comparing it against one of the readings in the table? [2]

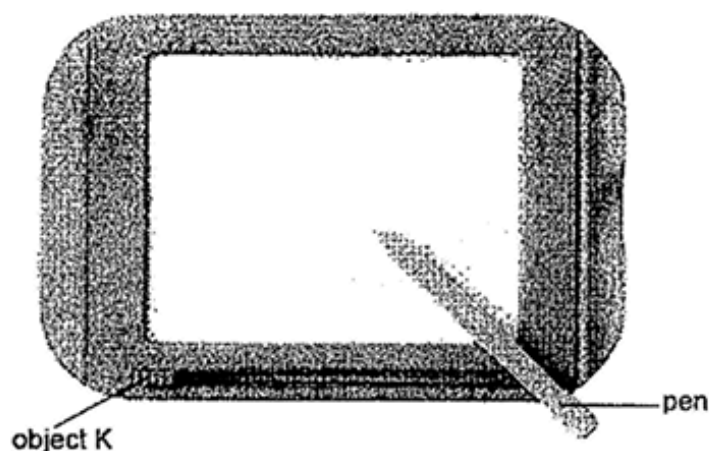
35. Heidi carried out an experiment to investigate how the number of folds of the towel affects the time taken for the towel to dry. She soaked three similar towels with the same volume of water and hung them on a clothes line with different number of folds as shown below.



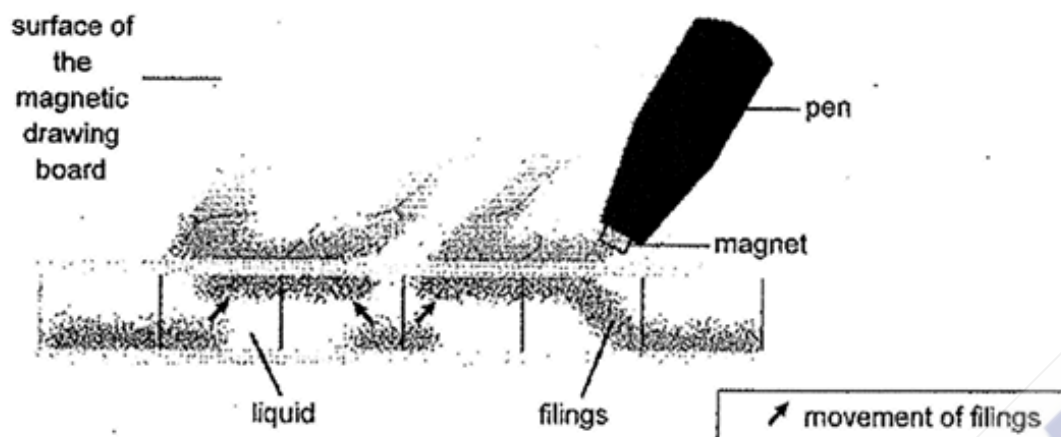
- (a) Name the process that causes the towel to dry. [1]

- (b) Which towel took the longest time to dry completely? Explain why. [2]

36. Rachel has a magnetic drawing board as shown below. The tip of the pen is made of a magnet.



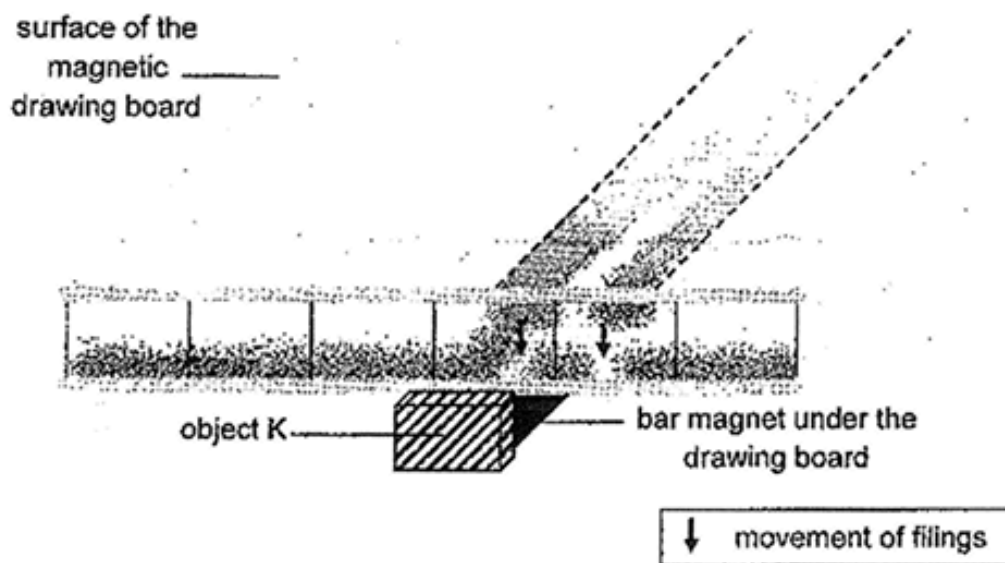
She notices that whenever her pen tip touches the surface of the magnetic drawing board, a black dot would form directly under the pen tip. When she drags the pen tip across the board, the black dots will appear to form a pattern according to where her pen moves.



Her mother explains that there are filings inside the thick magnetic drawing board that causes these black dots to form. When the tip of the pen moves over the surface of the drawing board, these filings move up to the surface. There is a layer of thick liquid that prevents these filings from sinking to the bottom.

(a) What is the type of material needed to make these filings? [1]

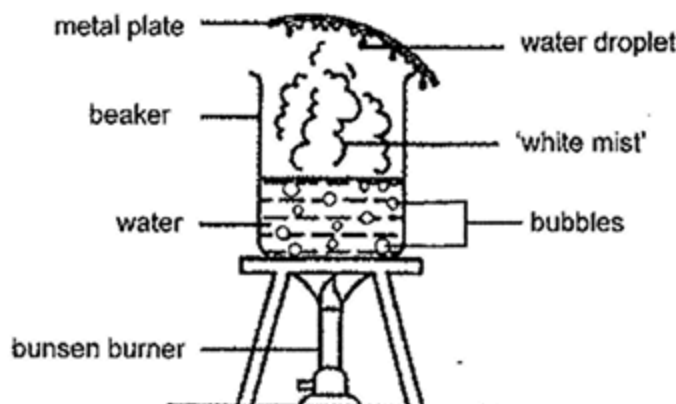
Object K is attached to a long bar magnet placed at the base of the drawing board. To erase the drawings on the board, Rachel has to slide object K across the board.



(b) Explain how this action erases the drawings on the board. [1]

(c) When she replaces the pen with an iron rod, she was not able to draw on the board. Explain why. [1]

37 Lauren set up an experiment as shown below.



The water in the beaker was heated over a bunsen burner.

When the water is boiling, Lauren noticed bubbles moving to the surface of the water and 'white mist', rising from the surface of the water.

(a) In the experiment set-up above,

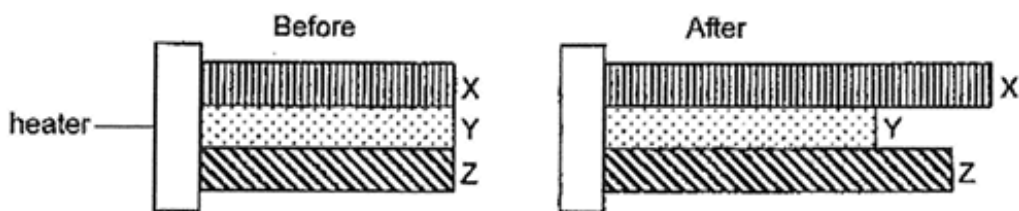
i. Identify the state of the 'white mist'. [1]

ii. When the water is boiling, what can be found inside the bubbles? [1]

(b) Lauren wanted to reduce the amount of water droplets formed on the plate within a given period of time.

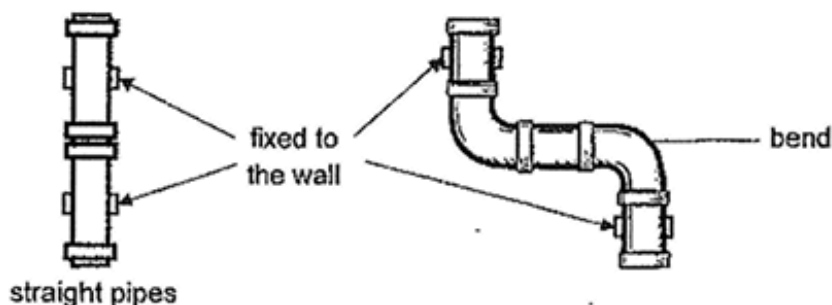
Suggest a material to replace the metal plate. Explain your answer. [2]

38. Peter secured three similar metal plates made of different materials, X, Y and Z, against the heater. After ten minutes, he noticed that the three plates have increased in their lengths. His observations are shown below.



- (a) What conclusion can he make about plates X, Y and Z? [1]

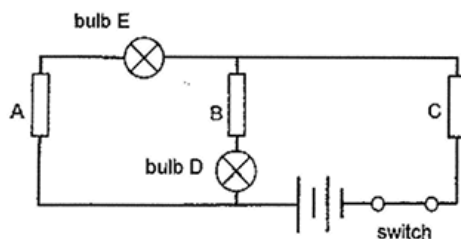
Peter notices that in industrial areas, pipes are constructed with bends instead of long straight pipes, allowing very hot liquid to flow through without the pipes breaking.



- (b) Explain how bending the pipes helps to prevent them from breaking when hot liquid flows through them? [1]

- (c) Which material, X, Y or Z, will be most suitable to make these pipes? Explain your answer. [2]

39. Bala set up a circuit as shown below with rods of different materials, A, B and C.

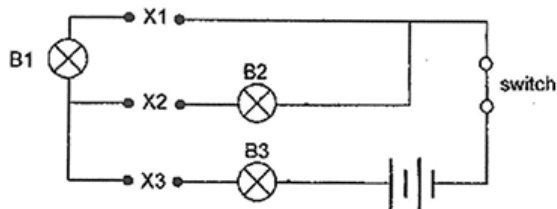


When the switch was closed, bulb D lighted up but bulb E did not light up.

- (a) Suggest a material that rod A could have been made of. [1]

- (b) Explain why did bulb D light up but not bulb E? [2]

- (c) Bala set up another circuit as shown below. He placed rods A, B and C, from the earlier experiment, in different positions, X1, X2 and X3.



In the table below, fill in the boxes with letters A, B and C to indicate the possible positions of these rods for the bulbs to light up in the following arrangements (i) and (ii). [2]

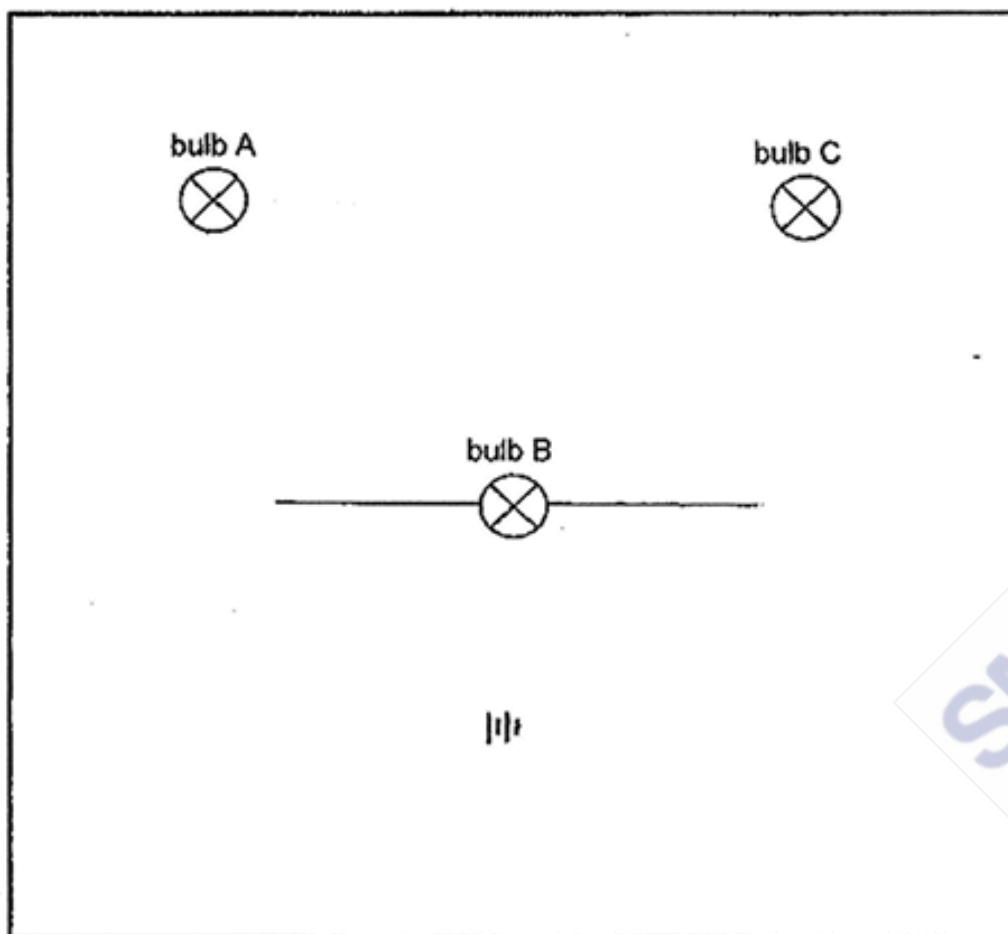
	Rods that were placed in positions			Bulbs that lit up		
	X1	X2	X3	B1	B2	B3
(i)				✓		✓
(ii)					✓	✓

40. Abdul set up a circuit with two batteries, three identical bulbs, A, B and C, and some wires. All the bulbs lit up.

As Bulbs A, B and C are removed one at a time from the circuit, Abdul observed the following:

Bulb removed	Observation
A	B remained lit but C did not light up
B	A and C remained lit
C	A did not light up but B remained lit

Using the information above, complete the circuit diagram below to show how Abdul had connected the given components. [3]



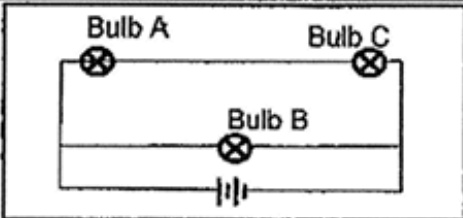
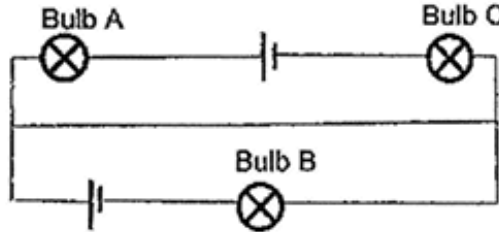
ANSWER SHEET

Q1	2
Q2	4
Q3	1
Q4	3
Q5	2
Q6	4
Q7	4
Q8	4
Q9	3
Q10	4
Q11	3
Q12	4

Q13	2
Q14	3
Q15	3
Q16	3
Q17	2
Q18	2
Q19	3
Q20	2
Q21	1
Q22	2
Q23	4
Q24	2
Q25	3
Q26	1
Q27	2
Q28	2

Q29a	Part E: womb/uterus Part F: ovary Part G: Penis Part H: testis
Q29b	F produces eggs.
Q30a	Chloroplast(s)
Q30b	Chloroplast contains chlorophyll (optional) that helps a plant to trap light © to make food (e) during photosynthesis.
Q30c	Cell B as it does not have chloroplast © so it does not photosynthesise/make food (e).
Q31a	Arrow A
Q31b	Large petals/Anthers and stigma are within the flowers
Q31c	Plant W: Animal Plant X: Water Plant Y: Splitting Plant X: Wind
Q32a	Animal X has 4 stages in its life cycle but animal Y has 3 stages in its life cycle. OR The young of animal Y looks like its adult but the young of animal X does not.
Q32b	The pupa's movement is very limited in the water but the adult can fly around anywhere in the air.
Q32c	As the surrounding temperature increases, the number of days the mosquito eggs takes to reach its adult stage after hatching decreases.

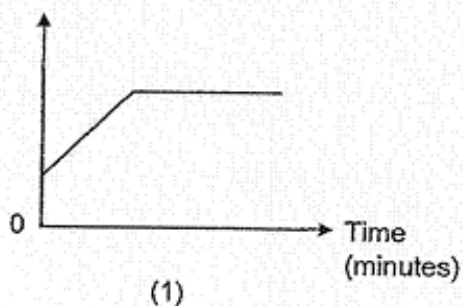
33a	There is more carbon dioxide in P than in Q. In Q, the plant takes in carbon dioxide to makes food / photosynthesise. In P, the rat releases carbon dioxide .
33b	The limewater in set-up R would be chalkier/more chalky.
33c	Plant B cannot receive light as the cardboard does not allow light to pass through (opaque) so Plant B cannot photosynthesise so it can only produce carbon dioxide . Plant A can receive light as the glass allows most light to pass through (transparent) so it takes in carbon dioxide to photosynthesise. This results in set-up Q having less carbon dioxide than set-up P.
34a	The chlorophyll in the leaf traps light . With carbon dioxide and water , the leaf makes food which produces sugar (and oxygen).
34b	1.5 cm
34c	When D is at 12 cm compared to 14 cm, the leaves took in more light . The rate of photosynthesis is higher so the plant produced more oxygen .
35a	Evaporation
35b	Answer is B. B had the least exposed surface area so the evaporation of water is the slowest .
36a	Magnetic material
36b	The bar magnet will attract the iron filings to the bottom of the board as it is being slid across.
36c	The iron rod is not a magnet and cannot attract the filings .
37ai	Liquid
37aii	Water vapour at 100°C / Steam
37b	Plastic wood / Foam/ Clay. Plastic is a poorer conductor of heat than metal so condensation is slower (e).
38a	X expands the most, followed by Z and then Y
38b	The bends allow space for the pipes to expand the pipes will not break .
38c	Y expands the least (evidence) so there is less chance for the pipe to break (e).
39a	plastic/rubber/glass/wood

39b	Material/Rod A is an electrical insulator and so it <u>forms an open circuit</u> (or <u>electricity can flow through bulb D</u>). Material/Rods B and C are electrical conductors and so it <u>forms a closed circuit</u> (or <u>electricity can flow through bulb</u>																								
39c	<table border="1"> <tr> <th colspan="3">Rods that were placed in positions</th> <th colspan="3">Bulb that would light up</th> </tr> <tr> <th>X1</th> <th>X2</th> <th>X3</th> <th>B1</th> <th>B2</th> <th>B3</th> </tr> <tr> <td>B/C</td> <td>A</td> <td>C/B</td> <td>✓</td> <td></td> <td>✓</td> </tr> <tr> <td>B/C</td> <td>C/B</td> <td>A</td> <td></td> <td>✓</td> <td>✓</td> </tr> </table>	Rods that were placed in positions			Bulb that would light up			X1	X2	X3	B1	B2	B3	B/C	A	C/B	✓		✓	B/C	C/B	A		✓	✓
Rods that were placed in positions			Bulb that would light up																						
X1	X2	X3	B1	B2	B3																				
B/C	A	C/B	✓		✓																				
B/C	C/B	A		✓	✓																				
40	 <p>Bulbs A & C are in parallel arrangement of bulb to B. A & C are in series arrangement of bulb.</p>																								
or																									

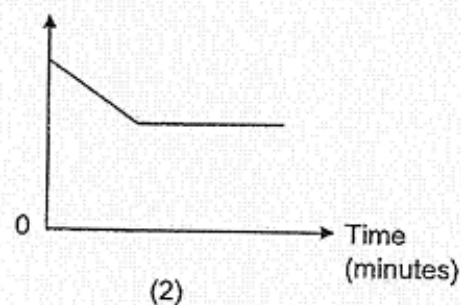
TAO NAN SCHOOL WA2 PAPER

1. Which graph below shows how the breathing rate changed when a man rested after a soccer match?

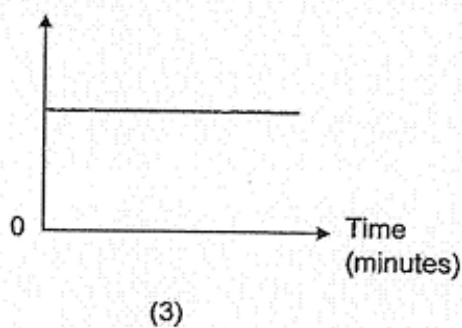
Breathing rate
(breaths per minute)



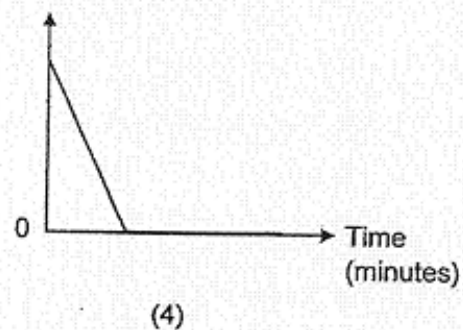
Breathing rate
(breaths per minute)



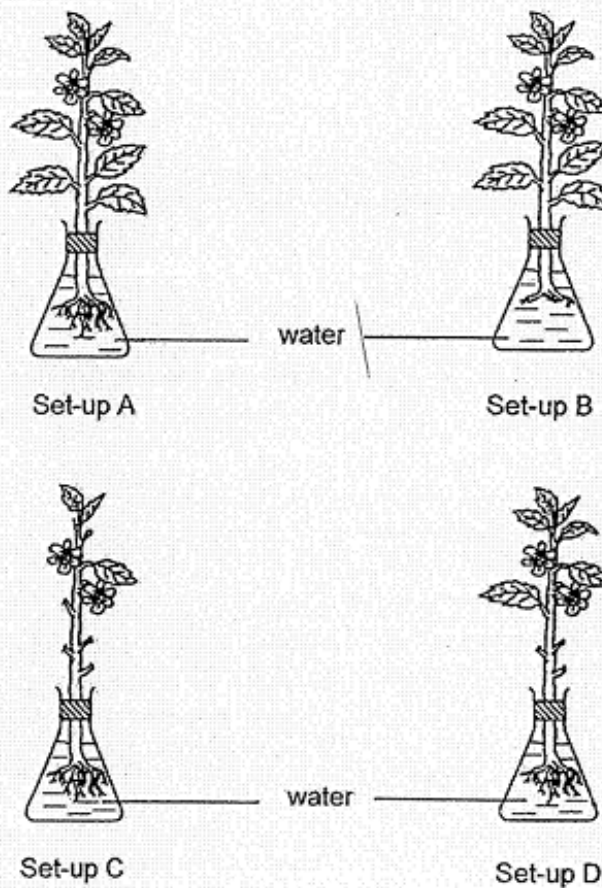
Breathing rate
(breaths per minute)



Breathing rate
(breaths per minute)



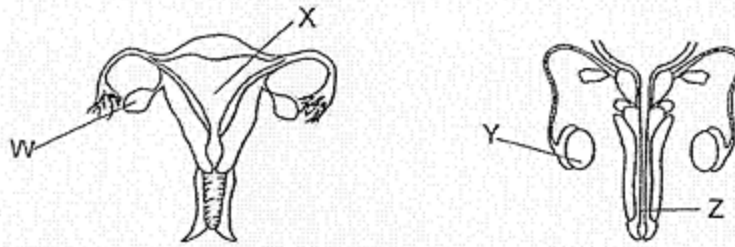
2. Ganesh wants to find out how the number of leaves on a plant would affect the amount of water absorbed by the roots. He placed the same type of plants in identical set-ups as shown below.



Which of the following set-ups should Ganesh use?

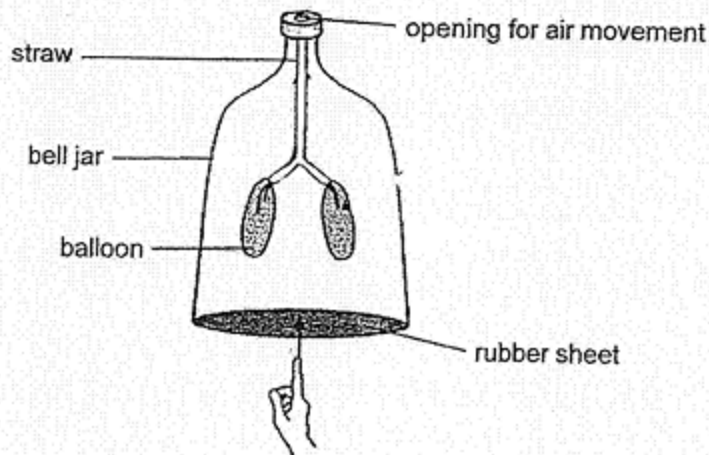
- (1) A and B only
- (2) A, C and D only
- (3) B, C and D only
- (4) A, B, C and D

3. The diagrams below show the human reproductive systems.



Which of the following statements about the parts W, X, Y or Z is correct?

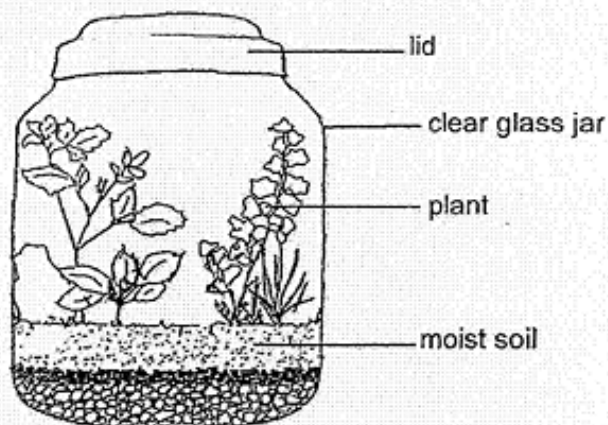
- (1) Part W produces sperms.
 - (2) Part Y produces one egg at a time.
 - (3) Part Z produces one sperm at a time.
 - (4) Part X provides a place for the fertilised egg to develop.
- ()
4. David constructs a model to represent the respiratory system of the human body for his school project.



When the rubber sheet is pushed up as shown in the diagram, what will happen to the balloons?

- (1) The balloons will inflate as air is sucked into the straw.
 - (2) The balloons will deflate as air is sucked into the straw.
 - (3) The balloons will inflate as air is pushed out of the straw.
 - (4) The balloons will deflate as air is pushed out of the straw.
- ()

5. The diagram below shows a terrarium. It is observed that the plants in the glass jar survive well when placed next to a window, without adding water or removing the lid.



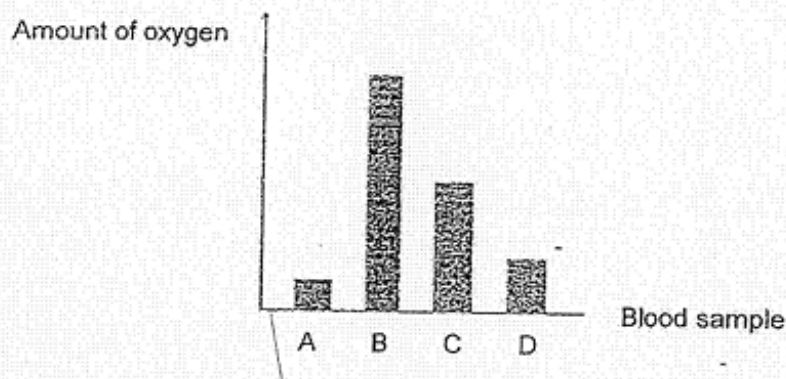
Which of the following process(es) is/are taking place in the glass jar that help the plants to get a continuous supply of water?

- (1) Evaporation only
 - (2) Condensation only
 - (3) Evaporation and condensation only
 - (4) Boiling, evaporation and condensation only
- ()
6. John conducted an experiment on substance P to determine its melting point and boiling point. He found that it was a solid at 68°C and a gas at 155°C . Which of the following is a possible melting point and boiling point of P?

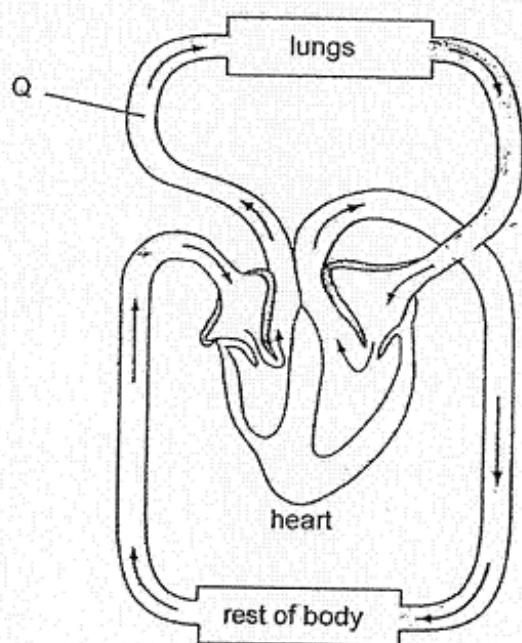
	Melting point of P ($^{\circ}\text{C}$)	Boiling point of P ($^{\circ}\text{C}$)
(1)	45	135
(2)	45	160
(3)	80	135
(4)	80	160

()

7. A doctor did a blood test for a patient. The graph below shows the amount of oxygen in blood samples taken at the same time from four different blood vessels of the patient.



The diagram below shows how blood is circulated in a human body.

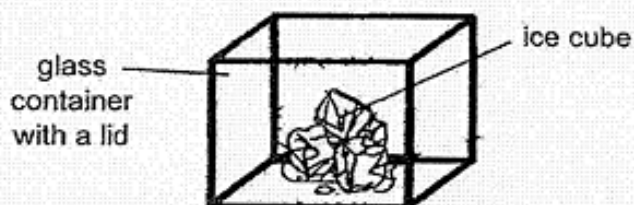


Which blood sample (A, B, C or D) was most likely taken from Q of the circulatory system above?

- (1) A
- (2) B
- (3) C
- (4) D

()

8. Mary removed some ice cubes at 0°C from the freezer. She placed them into a sealed transparent glass container as shown below. The glass container was then left at room temperature of 30°C .



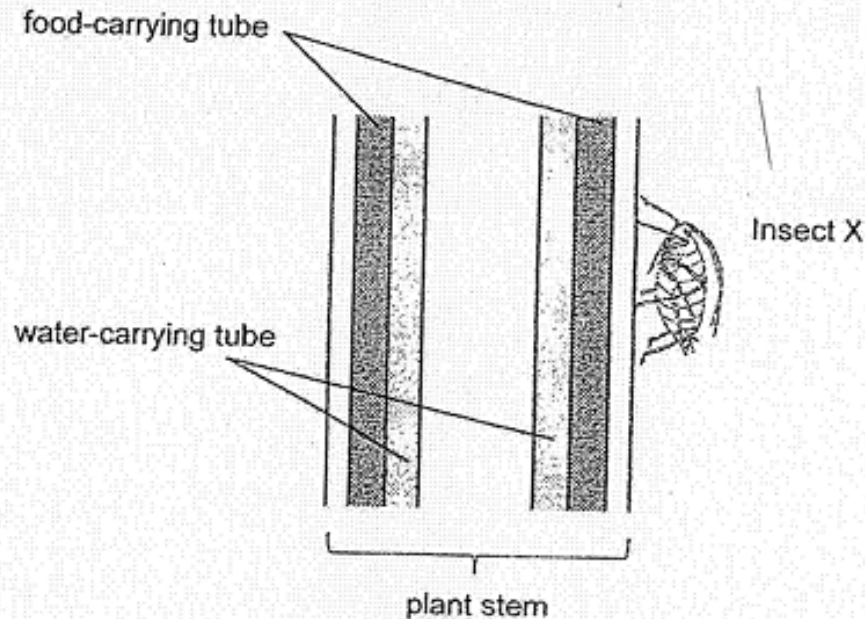
Which of the following correctly describes the temperature of the air in the container and the ice cubes only during the melting process?

	Temperature	
	Air in the container	Ice cubes
(1)	decreases	increases
(2)	decreases	decreases
(3)	increases	remains the same
(4)	decreases	remains the same

()

– End of Section A –

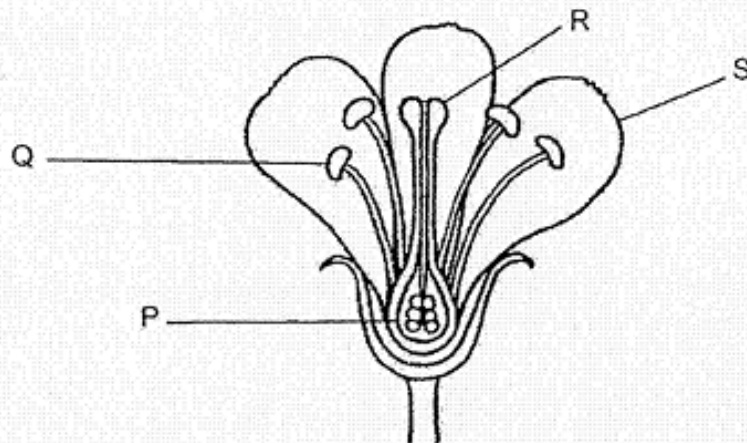
9. Insect X has a special mouthpiece to pierce through plant stems for feeding.



Explain why the growth of the plant roots may be affected when many insects X feed on the plant. [2]

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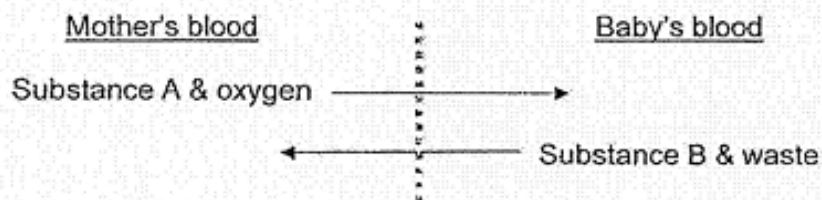
10. The diagram below shows parts of a flower, P, Q, R and S.



(a) Using the above diagram, complete the table below by filling in the correct parts of the flower, P, Q, R or S. [1]

Parts of the flower	Functions
i) _____	Similar to the human testis
ii) _____	Similar to the human ovary

(b) Below shows a diagram of a membrane that separates the mother's blood and the baby's blood, and the flow of substances when the baby is in the mother's womb.



Based on the above information, identify substance A and substance B in the table below. (Do not state "water".) [1]

Substance A	(i) _____
Substance B	(ii) _____

11. Tiffany was drinking a cup of warm coffee outside her house in the cold winter. She left her cup of coffee outside and went into her house to answer an important phone call. Tiffany returned one hour later and discovered that she could tilt the cup as shown below without the coffee spilling.



What had happened to the coffee? Explain your answer.

[2]

12. Olivia measured her heart rate when she carried out different activities.

(a) Tick the activity in the table below that would have the highest heart rate. [1]

Activity	Tick '✓'
slow walk home	
sound sleep	
game of badminton	
relaxed chit-chat with a neighbour	

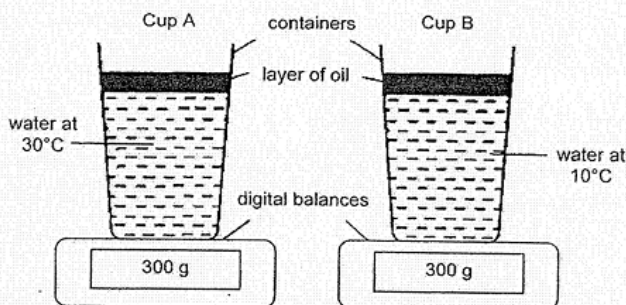
(b) Explain your answer in part (a).

[2]

(c) What could Olivia do to improve the reliability of her readings?

[1]

13. Fatimah placed two cups, A and B, with the same amount of water on a digital balance each. They were placed at room temperature of 30°C .

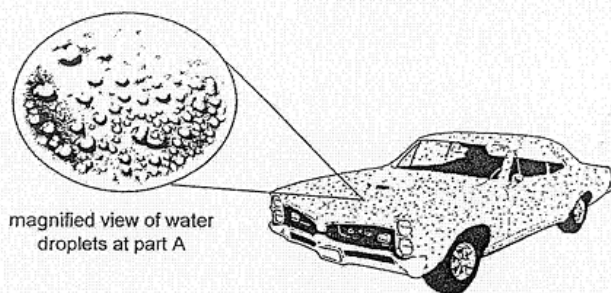


After ten minutes, the reading for cup A remained the same at 300 g while the reading for cup B increased to 303 g.

- (a) Why was a layer of oil added to the water in each cup? [1]

- (b) Why is there an increase in the reading for cup B? [2]

Mr Lim leaves home for work every morning at around 7.00 a.m. He observes that his car is usually covered with many tiny water droplets.



- (c) Explain why the water droplets at part A of the car disappears shortly after the engine is started. [1]

— End of Paper —

ANSWER SHEET

Q1	2	Q2	2	Q3	4	Q4	4	Q5	3
Q6	3	Q7	1	Q8	4				

Q9	Insect X feeds on the food-carrying tube, food cannot be transported to the roots, roots will die without food thus not growing well.
Q10	(a) (i) Q (ii) P (b)(i) digested food (ii) carbon dioxide
Q11	The warm coffee lose heat to the surrounding and froze.
Q12	(a) Tick : game of badminton (b) Game of badminton needs more energy than the rest of the activity so Olivia's heart needs to pump faster to transport more digested food, oxygen and water to all parts of the body to release more energy, hence when playing badminton, the heart rate will increase more. (c) repeat all the activities she had done again, and measure her heart rate again for at least two to three time to improve reliability of readings.
Q13	(a) To make sure there is no evaporation. (b) The water vapour in the surrounding came in contact with the cooler surface of cup B, and lost heat can condensed to form ting water droplets on the cooler surface of cup B, causing an increase of mass to cup B. (c) Starting the engine produces heat, so when the water droplets on the car gain heat from the engine, they will evaporate as water vapour.

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