AI TONG SCHOOL

Mid Year Examination 2021
PRIMARY SIX SCIENCE

(BOOKLET A)

10 May 2021

Total time for booklets A and B : 1 h 45 min

INSTRUCTIONS

Do not turn over this page until you are told to do so.

Follow all instructions carefully.

Answer all questions.

Name : _____

Class : Primary 6 _____

Parent's Signature : _____

Booklet A	56
Booklet B	44
Total	100

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. David made the following statements about bacteria in his journal.

   A It is not always harmful.
   B It reproduces by spores.
   C It can make its own food.
   D It can break down animal waste.

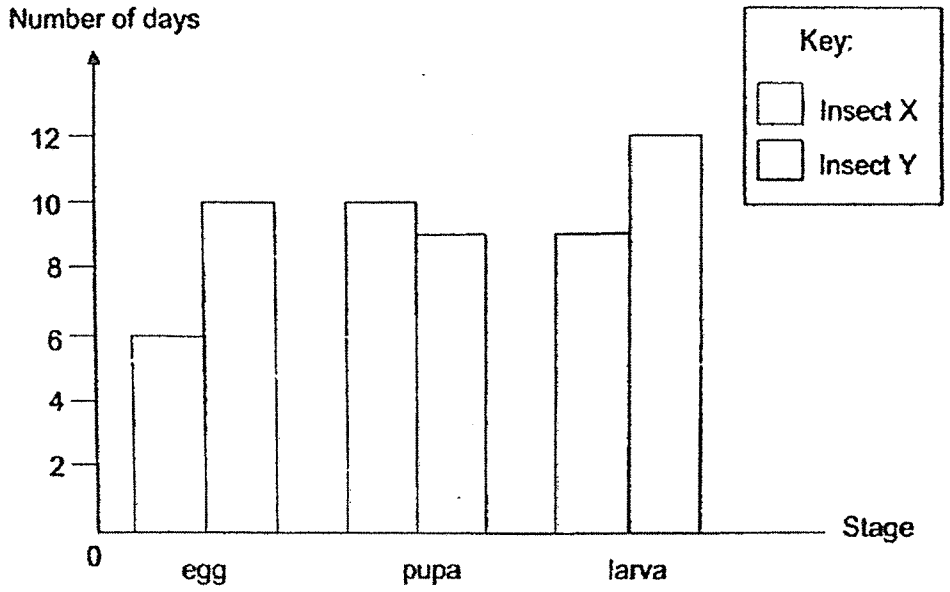
   Which of the following statements are not correct?

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

2. Which of the following statements on the functions of the lungs and the heart is true?

   (1) The lungs transport oxgyen produced by the heart around the body.
   (2) The heart takes in oxygen from the surrounding air into the body.
   (3) The heart removes carbon dioxide from the lungs.
   (4) The lungs remove carbon dioxide from the body.

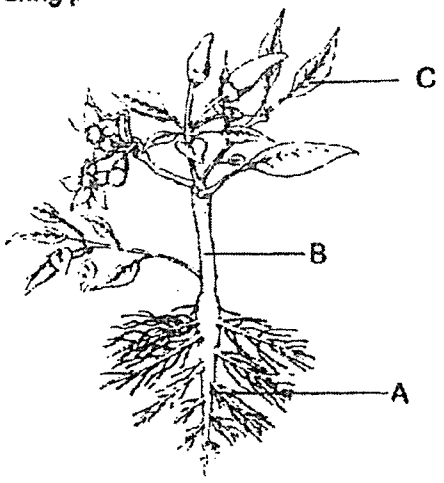
3. The bar graph shows the number of days each stage of the life cycles of insects X and Y lasts.



Which of the following shows the stage insects X and Y would be at on the 16th day after the eggs were laid?

	Insect X	Insect Y
(1)	pupa	pupa
(2)	pupa	larva
(3)	larva	pupa
(4)	larva	larva

4. The diagram shows a flowering plant.

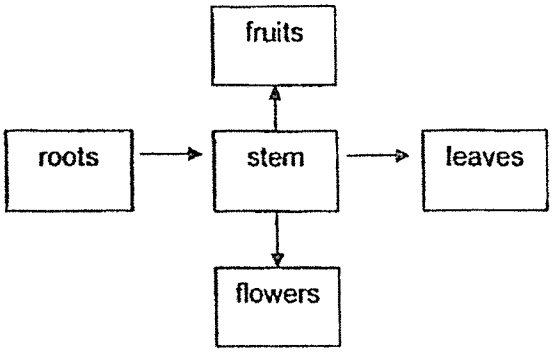


At which part(s), A, B or C, can water-carrying tubes be found?

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

5. Which of the following correctly shows the movement of food in plants?

(1)



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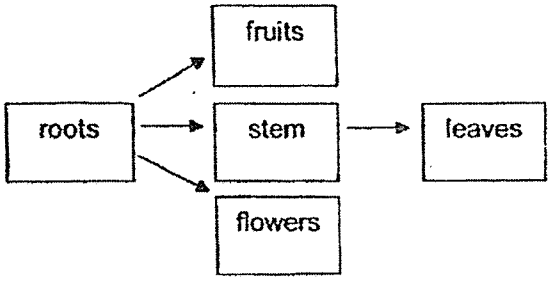

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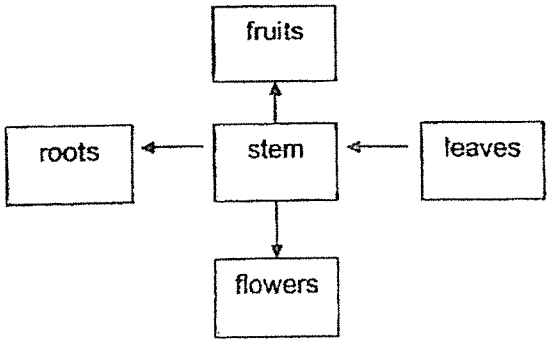
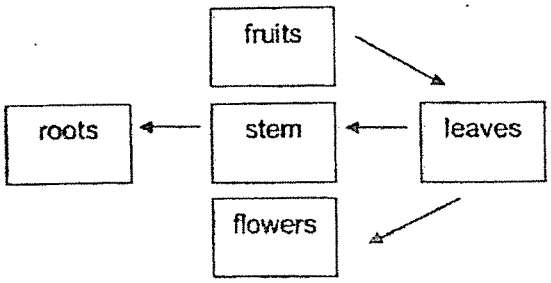
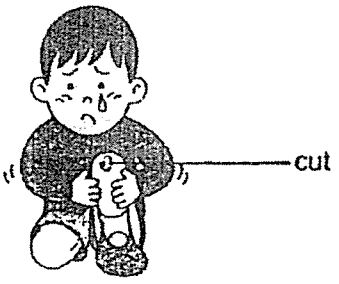


(4)



6. Xiao Ming fell and cut his knee.

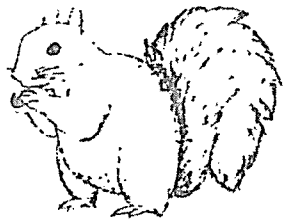


Which of the statements are correct?

A His injured knee will have less skin cells than before.
B His knee has a fixed shape as the cells have cell walls.
C The skin cells on his knee will grow larger to heal the wound.
D His skin cells undergo cell division to replace damaged cells.

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

7. The diagram shows organism Q. It collects nuts and buries them in different locations. However, many nuts are not taken away by Q.

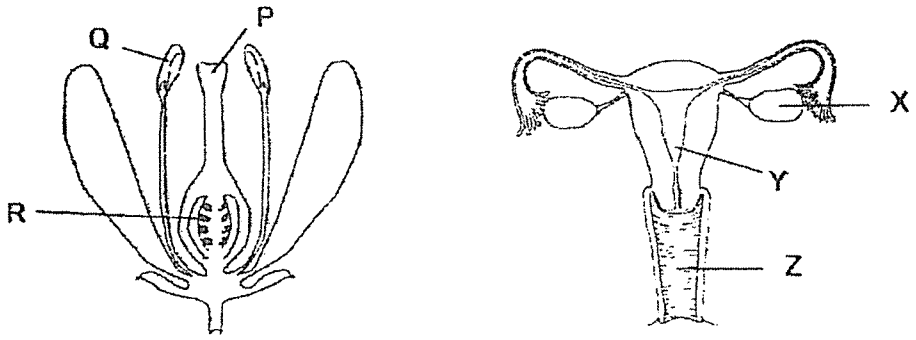


organism Q

Which of the following best explains how organism Q's action help in the reproduction of nuts?

(1) The nuts provide food for organism Q.
(2) Organism Q provides nutrients to the nuts.
(3) The nuts are fertilised and grow into new plants.
(4) The germinated nuts may be healthier as they are scattered.

8. The diagram below shows the reproductive systems of a plant and a human.



Which of the following is correct?

	Parts	Function
(1)	R and Y	Where pollination occurs
(2)	P and Y	Where fertilisation occurs
(3)	Q and X	Contain reproductive cells
(4)	Q and Z	Male reproductive cells meet female reproductive cells

9. Three plants, K, L and M were planted on a piece of land as shown in Diagram 1. Diagram 2 shows the distributions of plants K, L and M in the same piece of land a few years later.

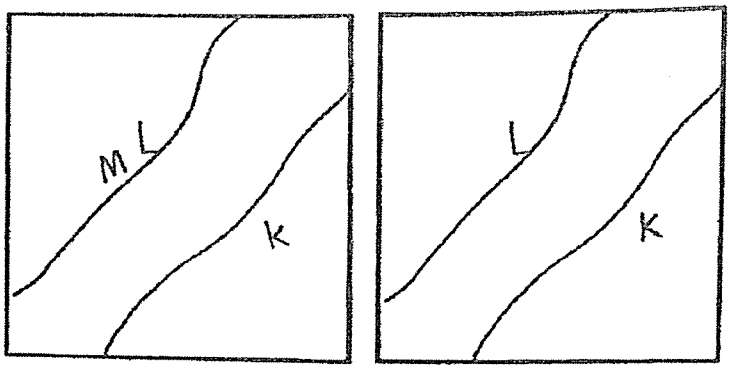
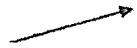
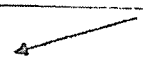


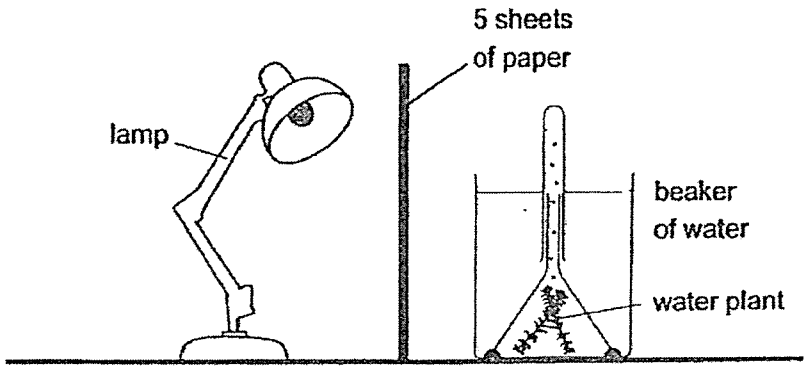
Diagram 1 Diagram 2

Based on the above diagrams, which of the following characteristics are correctly matched to the fruits of Plants K, L and M and the direction of water flow in the river?

	K	L	M	Direction of water flow
(1)	pod-like structure	hooks	fibrous husk	
(2)	fibrous husk	pod-like structure	hooks	
(3)	hooks	fibrous husk	wing-like structure	
(4)	pod-like structure	hooks	wing-like structure	

10. Peter placed a water plant in a beaker filled with water as shown in the diagram. He placed 5 sheets of paper in front of the lamp and switched it on. He counted the number of bubbles produced by the water plant for 2 minutes.

Peter repeated the experiment using 3 sheets of paper and then 1 sheet of paper.



Which of the following is the most suitable aim for the above experiment?

(1) To find out how the amount of water affects the rate of photosynthesis of the plant.

(2) To find out if the presence of light affects the rate of photosynthesis of the water plant.

(3) To find out how the amount of light affects the rate of photosynthesis of the water plant.

(4) To find out how the number of bubbles affect the rate of photosynthesis of the water plant.

11 Diagram 1 below shows parts of the human digestive system.

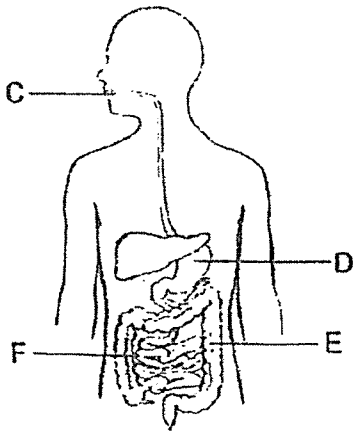
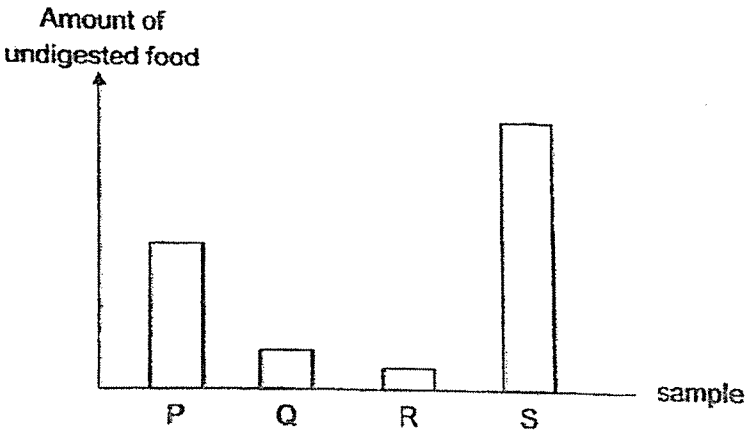


Diagram 1

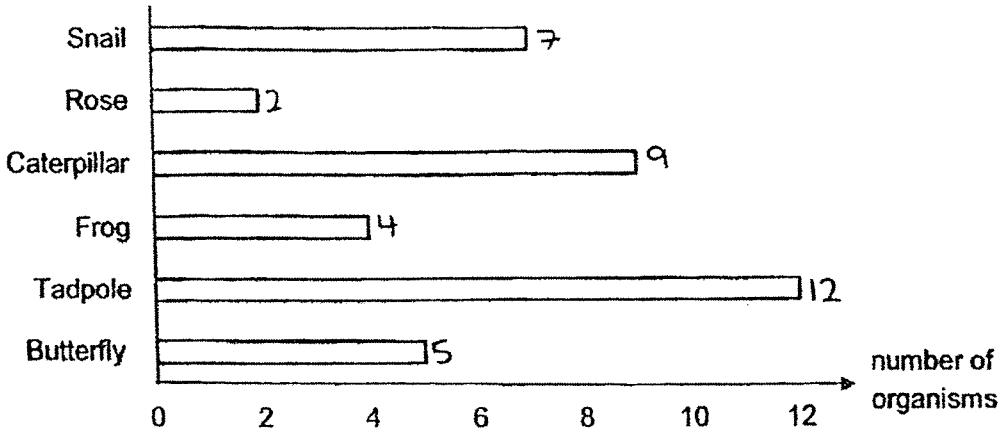
The graph below shows the amount of undigested food in samples P, Q, R and S obtained from different parts of the human digestive system.



Which of the following correctly matches the parts C, D, E and F in Diagram 1 to the samples P, Q, R and S in the graph?

	Part of digestive system	Sample in graph
(1)	C	P
(2)	D	Q
(3)	E	R
(4)	F	S

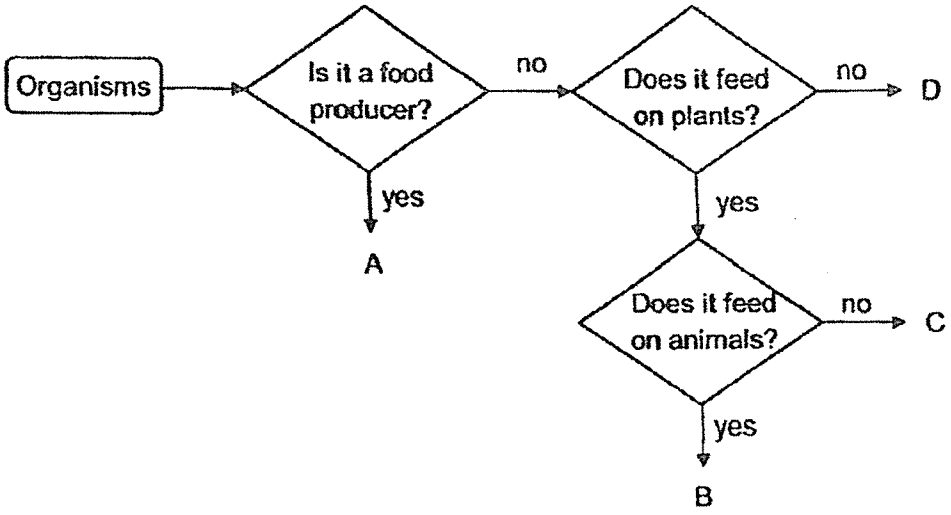
12. Farmer Ben counted the number of organisms living in his garden and plotted the bar graph as shown.



Based on the bar graph, which of the following is correct?

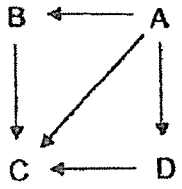
(1) There are 2 populations of producers.
(2) There are 4 populations in this habitat.
(3) There are 5 populations of consumers.
(4) There are 6 populations in this habitat.

13 Four organisms, A, B, C and D, found in the same habitat have been classified into the flowchart as shown.

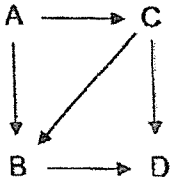


Which of the following food webs show the correct food relationships of the four organisms?

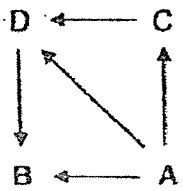
(1)



(2)



(3)



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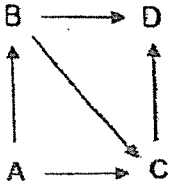
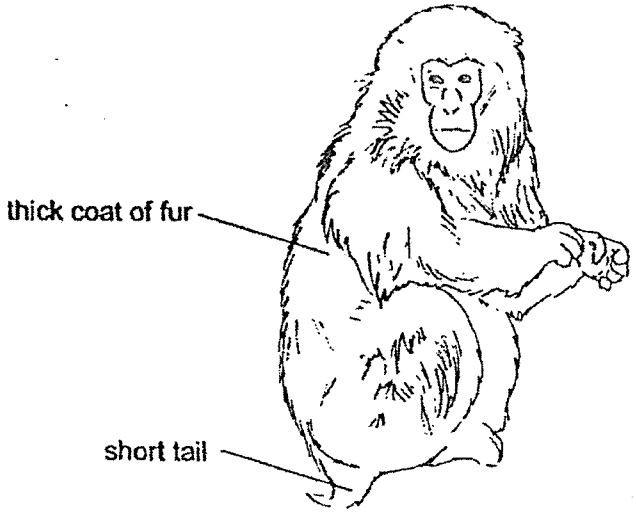


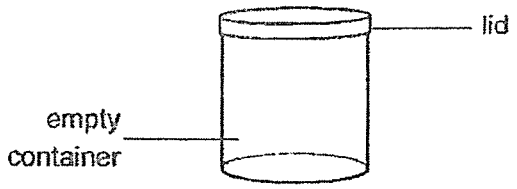
14. The diagram shows an organism that lives in the cold mountains. In winter, it does not hibernate and will soak in hot springs.



Based on the information above, which of the following is an adaptation that helps the organism to survive in its habitat?

	Adaptation	Type of adaptation	How it helps the organism to survive in its habitat
(1)	short tail	structural	to reduce heat loss to the environment
(2)	thick coat of fur	behavioural	to keep warm
(3)	soaks in hot spring	behavioural	to escape from its predators
(4)	eats a lot during summer	structural	to attract mates

15. An empty container with a lid shown below has a capacity of 200cm^3.



Which of the following substances can the container hold without overflowing?

A 200 cm^3 of oil
B 150 cm^3 of sand
C 250 cm^3 of carbon dioxide
D 200 identical wooden cubes, each with a volume of 1 cm^3

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

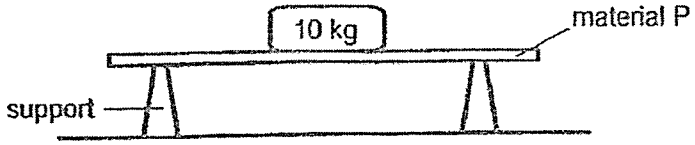
16. Three children made the following observations about two substances, X and Y.

David : The two substances are in the same state at 87°C.
Evelyn : Substance X is a liquid at 25 °C.
Fatimah : Substance Y is a solid at 20 °C.

Which of the following shows the possible freezing point and boiling point of the two substances?

	Substance X		Substance Y	
	Freezing point (°C)	Boiling point (°C)	Freezing point (°C)	Boiling point (°C)
(1)	9	80	45	120
(2)	40	75	25	90
(3)	5	68	12	70
(4)	10	90	30	110

17. Sue set up an experiment as shown. She placed a 10kg weight on material P until it breaks. She repeated the experiment with different materials, Q, R and S, of the same size and thickness.



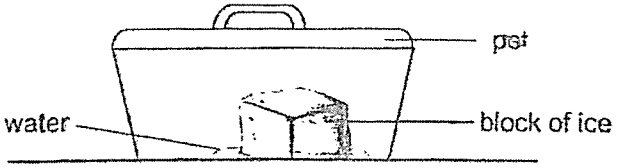
The table below shows the number of weights each material could hold before breaking.

Material	Number of 10kg weights
P	2
Q	9
R	1
S	5

Which of the following statement that Sue made is correct?

(1) Material Q is the least flexible.
(2) Material R is the most flexible.
(3) Material P is weaker than material S.
(4) Material S is stronger than material Q but weaker than material R.

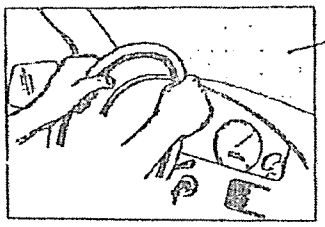
18. A block of ice was placed in a pot as shown in the diagram below. The pot was then left on the kitchen table.



What would happen to the temperature of the melting ice, the water and the air in the pot after some time?

	Temperature		
	air in the pot	water	melting ice
(1)	decrease	increase	increase
(2)	remains the same	increase	remains the same
(3)	decrease	remains the same	remains the same
(4)	remains the same	increase	increase

19. Sam observed some fog forming on the windscreen inside his car.

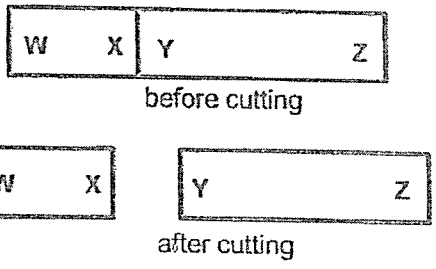


Which of the following most likely explain(s) Sam's observation?

A The windscreen gains heat from outside the car.
B The windscreen inside his car is cooler than the air inside his car.
C Fog loses heat to the windscreen and condenses into water droplets.
D Water vapour outside the car loses heat and condenses on the windscreen.

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

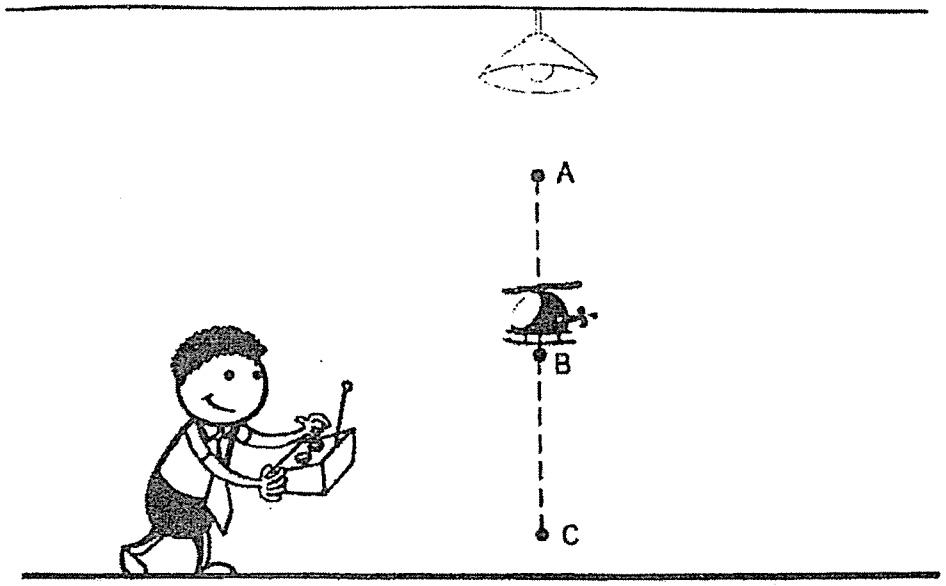
20 A magnet was marked out with letters W, X, Y and Z before it was cut to form two smaller magnets.



After the magnet was cut, the pieces were placed at the same distance from a tray of pins. Which of the following shows the possible number of pins attracted at positions W, X, Y and Z?

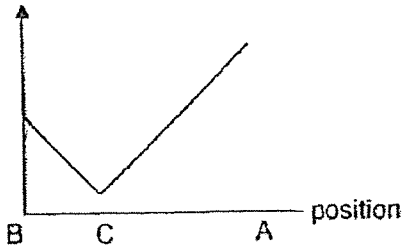
	W	X	Y	Z
(1)	8	1	3	8
(2)	1	8	8	3
(3)	8	1	8	3
(4)	8	8	8	8

21. Max used a remote control to move a helicopter. He observed the shadow cast on the floor.

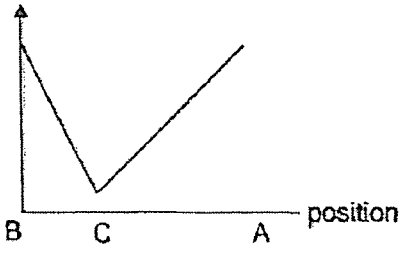


Which of the following graphs show the length of the shadow cast on the floor as the helicopter moved from point B to C and then to A?

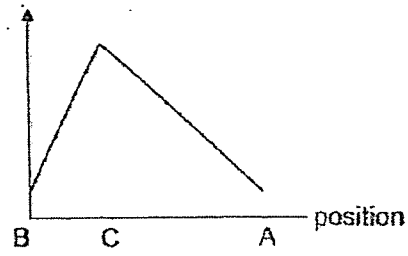
(1) length of shadow



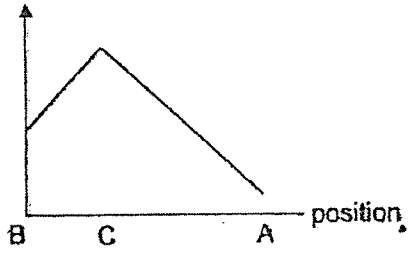
(2) length of shadow



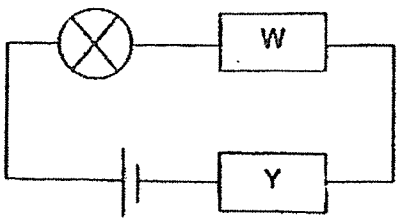
(3) length of shadow



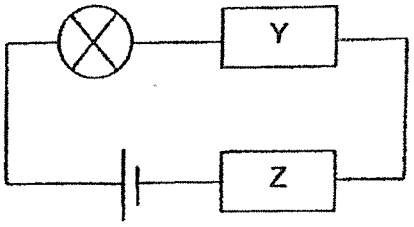
(4) length of shadow



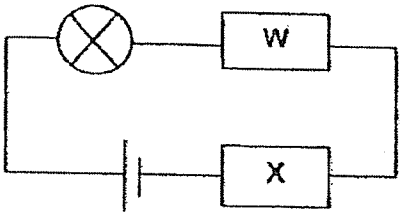
22. Four circuits are set up as shown. W, X, Y and Z represent four different materials.



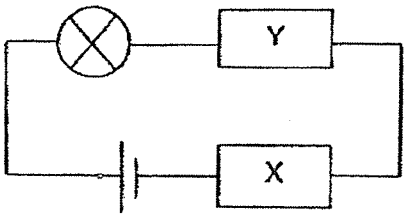
bulb does not light up



bulb does not light up



bulb lights up

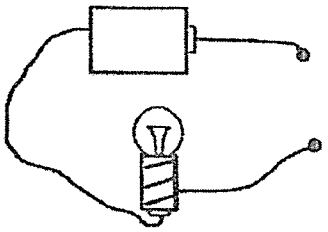


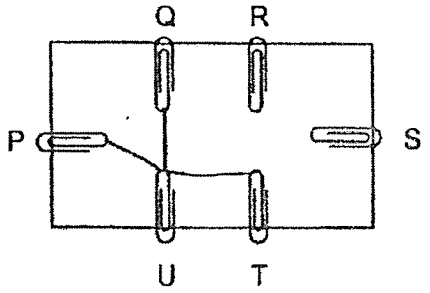
bulb does not light up

Based on the circuits, which of the following materials, W, X, Y or Z, is definitely a non-conductor of electricity?

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

23 The diagram shows a circuit tester and the top view of a circuit card with six paper clips, P, Q, R, S, T and U. The paper clips are connected using wires on the underside of the circuit card.



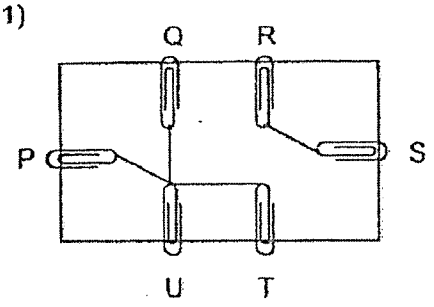


When Jacob connected the circuit tester to various paper clips, he obtained the following results.

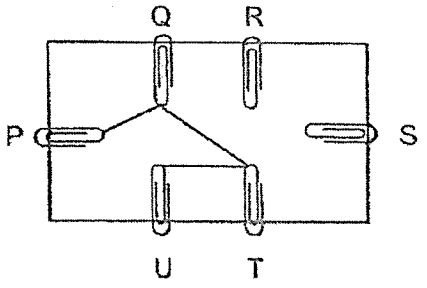
P	Q	R	S	T	U	Does the bulb light up?
✓					✓	Yes
	✓				✓	Yes
✓				✓		Yes
	✓		✓			No
		✓		✓		No

Which of the following connections is not possible on the underside of the circuit card?

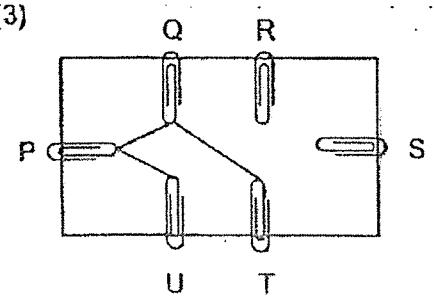
(1)



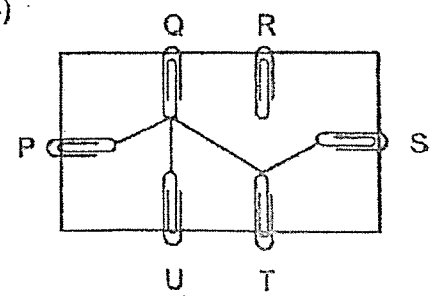
(2)



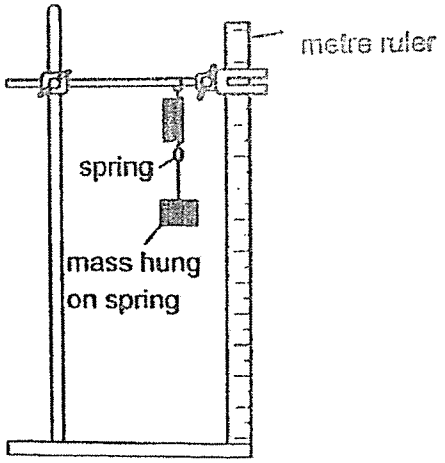
(3)



(4)



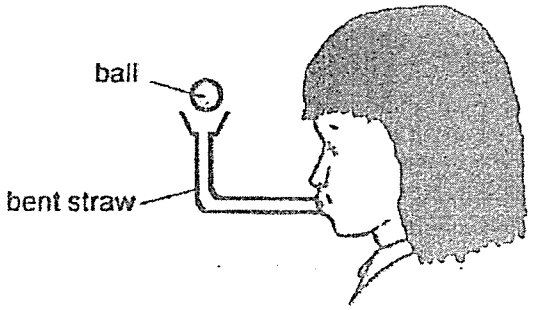
24. Rita set-up an experiment find out how the length of the spring is affected by the mass hung on it.



What could Rita do to improve the accuracy of her experiment?

(1) Use a shorter ruler.
(2) Use the same mass for each reading.
(3) Attach a pointer on the spring to measure the length.
(4) Repeat the experiment a few times and find the average.

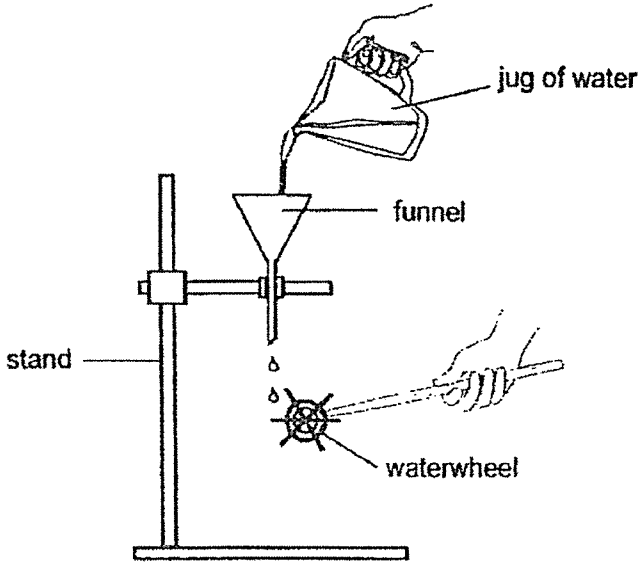
25 Sally blew air into a bent straw and the ball floated as shown.



Which of the following best explains why the ball floated in the air?

(1) There is no frictional force on the ball.
(2) There is no gravitational force acting on the ball.
(3) The force of the air exerted on the ball prevents it from dropping.
(4) The force of the air exerted on the ball reduces the gravitational force acting on the ball.

26. An experiment was set up as shown. When water drips out from the stem of the funnel, the waterwheel will spin.

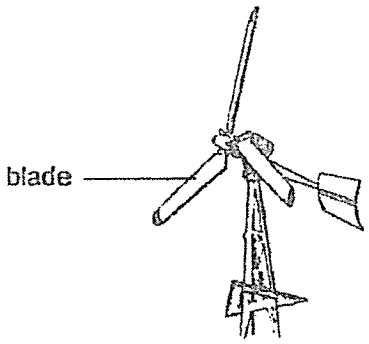


Which of the following will definitely make the waterwheel spin faster?

A Use a heavier waterwheel.
B Shift the funnel to a higher position.
C Shift the waterwheel to a higher position.
D Use a funnel with a wider opening at the stem.

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

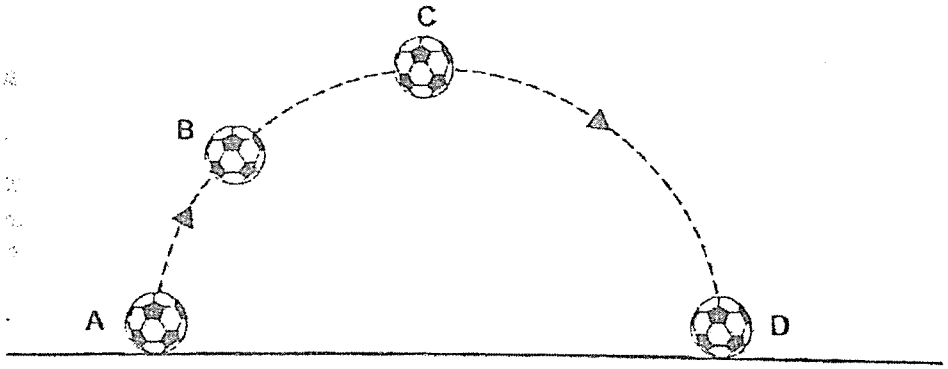
27. The diagram shows part of a wind turbine.



Which of the following is true about the wind turbine?

(1) Wind energy is non-renewable.
(2) Electricity can be produced without wind.
(3) More electricity is produced when the wind is stronger.
(4) Potential energy in the wind is converted to kinetic energy in the blades.

28. The diagram below shows the motion of a ball through the air.



Which of the following correctly describes the ball as it moves from A to D?

(1) The ball had the least kinetic energy at D.
(2) The ball had the most potential energy at A.
(3) As the ball moved from A to B, kinetic energy was converted to potential energy.
(4) As the ball moved from C to D, kinetic energy was converted to potential energy.

End of Booklet A

AI TONG SCHOOL

Mid Year Examination 2021
PRIMARY SIX SCIENCE

(BOOKLET B)

10 May 2021

Total time for booklets A and B : 1 h 45 min

INSTRUCTIONS

Do not turn over this page until you are told to do so.

Follow all instructions carefully.

Answer all questions.

Write your answers in this booklet.

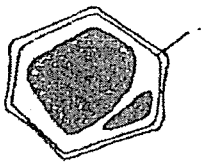
Name : _____

Class : Primary 6 _____

Parent's Signature : _____

Section B: 44 marks
Read the questions carefully and write down your answers in the spaces provided.

29. The diagram shows a cell of plant G.

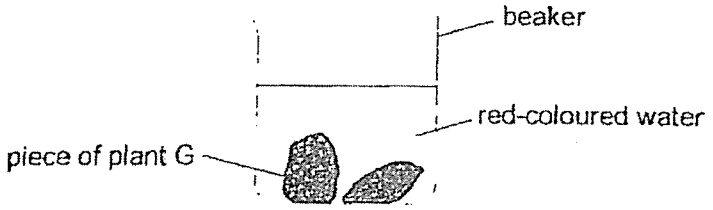


(a) Label 'cell membrane' in the diagram above. [1]

Plant G contains a red pigment in its cells that cannot pass through its cell membrane.

(b) Would the young of plant G also contain red pigment? Give a reason for your answer. [1]

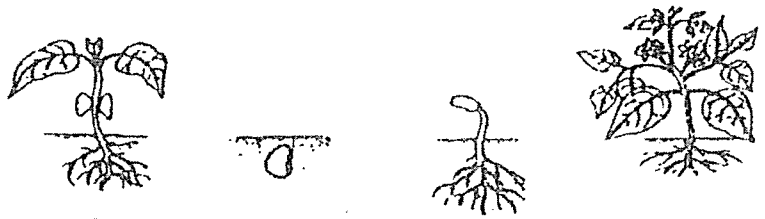
Sam conducted an experiment on plant G. He crushed plant G and placed two pieces of them into a beaker of water for several hours. He then observed that even though water has turned red, the pieces of plant G were still red.



(c) Explain why the water turned red. [1]

3

30. The diagram shows the different stages of growth in plant W.



(a) Arrange the above stages, A, B, C and D, in the correct order. [1]

Some ~~the~~ of the leaves of the plant wilted and fell to the ground. However they were not removed.

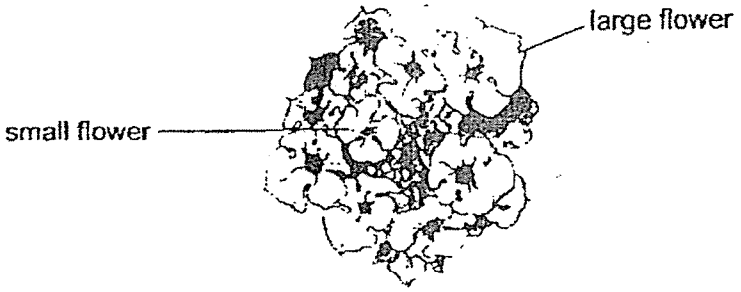
(b) Explain how the dead leaves will benefit the plant. [1]

_____

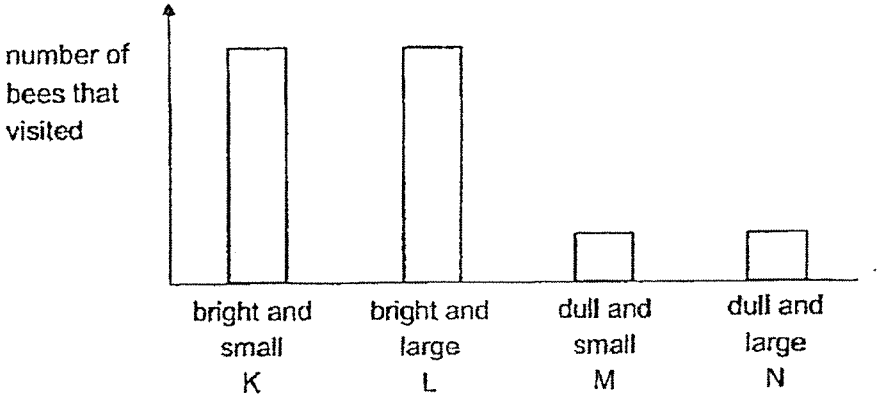
_____

2

Plant W has flowers of different sizes. The flowers have dull or bright colours.

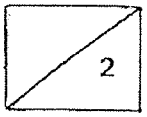


Mary counted the number of bees that visited each type of flower, K, L, M and N, one afternoon.

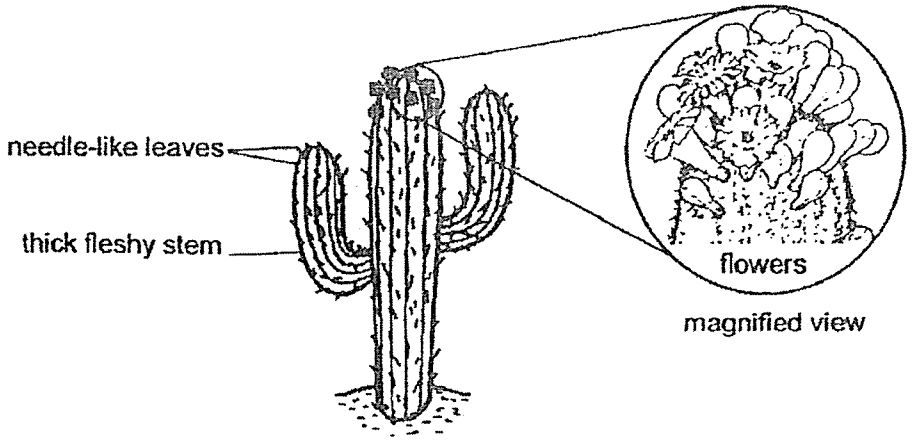


Mary thinks that the colour of flowers would affect the number of bees that visited the flowers.

(c) Which two types of flowers, K, L, M and N, did she use to arrive at this conclusion? Explain your answer. [2]



31. Plant D can be found in a desert. The flowers of plant D grow on the top of the stem and give off a strong scent.



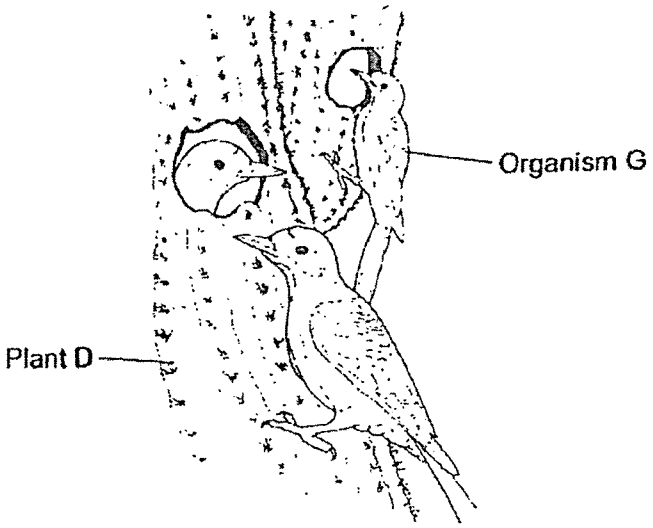
Plant D

(a) Explain how having flowers on the top of the stem benefits plant D. [1]

1

The statements below describe the behaviours of organism G.

- G eats fruit of D but cannot digest its seeds.
- G also digs holes in plant D to make a nest done without damaging plant D.
- G lays eggs in plant D.



(b) State a characteristic of G such that it can be identified as a bird. [1]

_____

(c) Explain how G benefits the survival of plant D. [1]

_____

_____

(d) Explain why it is an advantage for G to build a nest in plant D. [1]

_____

_____

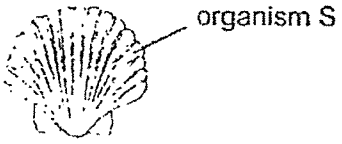
3

32. (a) Tiny openings are found on a leaf. State the function of the tiny openings. [1]

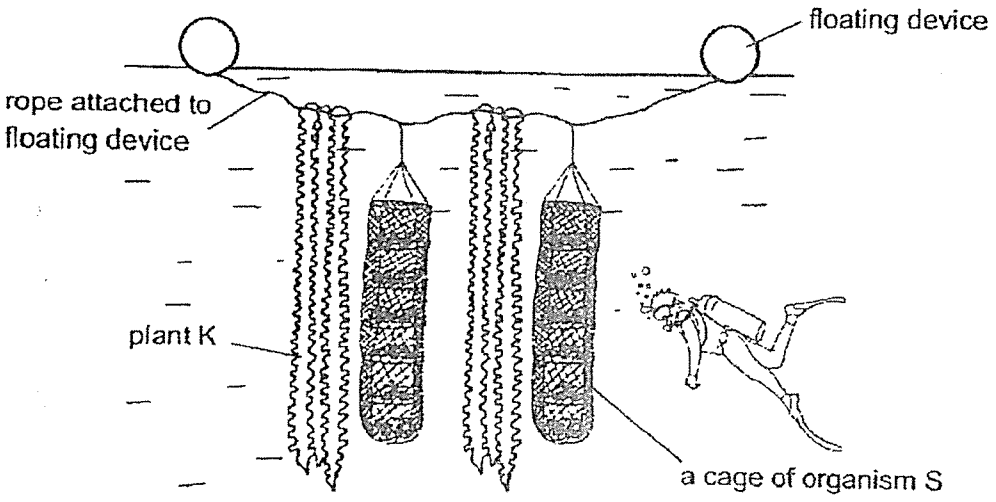
_____

_____

In seawater with high levels of carbon dioxide, organism S grows poorly.



Fisherman Ben tied Plant K next to a cage of organism S as shown below.



(b) Explain how plant K helps organism S to grow better in seawater with high levels of carbon dioxide. [2]

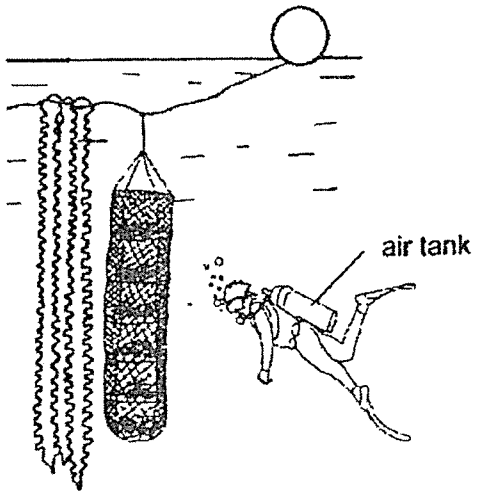
_____

_____

_____

3

Fisherman Ben carries an air tank so that he can breathe when he goes underwater to check on organism S.



(c) Name the body system that allow Fisherman Ben to breathe. [1]

_____

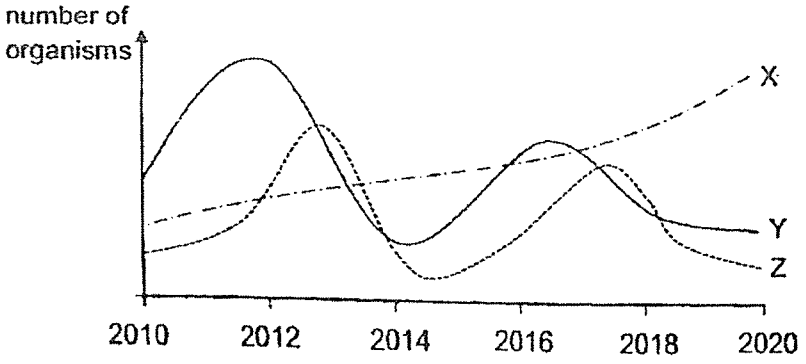
(d) Explain why Fisherman Ben will not be able to breathe underwater without the air tank. [1]

_____

_____

2

33. The graph below shows how the population of animals X, Y and Z changed over a period of 10 years in a particular habitat.



(a) Using the information, identify which animal is the prey and which animal is the predator. [1]

Prey: _____

Predator: _____

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

_____

_____

The food chain below is found in an aquatic habitat.

algae → A → B

Due to changes in weather, the algae grew extremely rapidly in the waters.
This caused a sharp decrease in population size of organisms A and B.

(c) Explain why a rapid increase in algae led to the sharp decrease in population size of organisms A and B. [1]

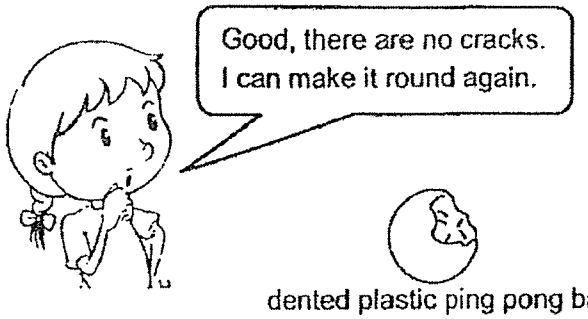
_____

_____

_____

3

34. Xiaomei found a dented ping pong ball.



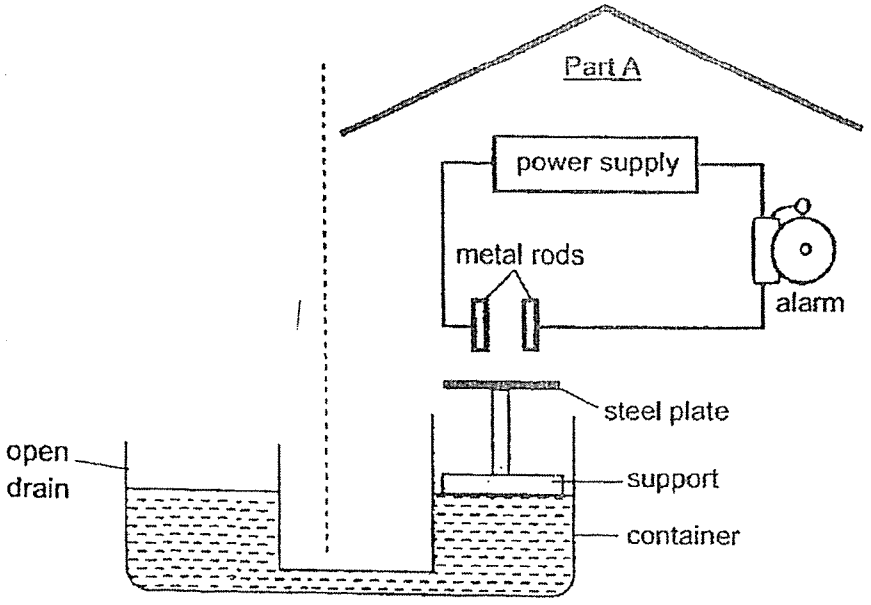
dented plastic ping pong ball

(a) Describe what Xiaomei can do so that the ping pong ball can return to its original shape. Explain how the method will work. [2]

(b) Compare the mass of the ping pong ball before and after returning to its original shape. Give a reason for your answer. [1]

3

35. An engineer constructed an electrical circuit which acts as a warning system to detect flooding as shown. Part A of the system is placed in a sheltered area.



When it is raining, rainwater is collected in the open drain which is linked to a container.

(a) The support should be made with a material that is waterproof.
Suggest another property of the material used to make the support. [1]

_____

(b) Explain how the alarm is turned on when it rains heavily. [2]

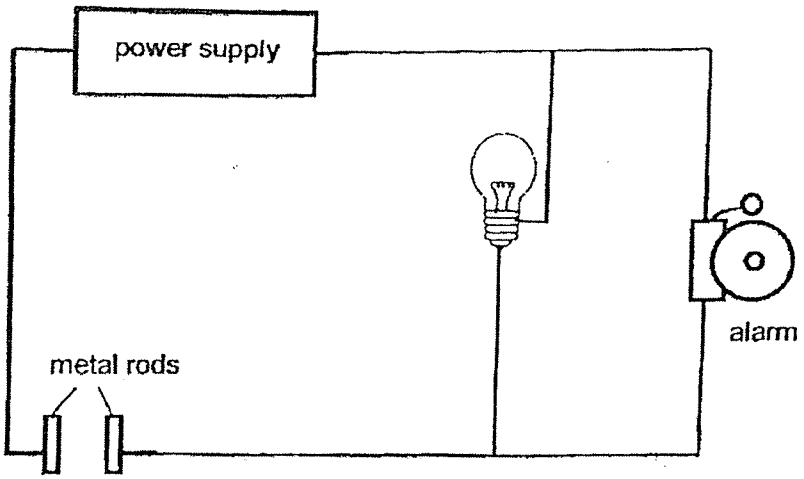
_____

_____

_____

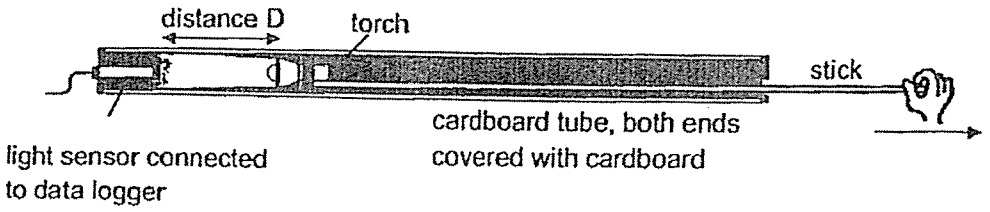
3

(c) The engineer added a light bulb to the warning system and the alarm rang as loudly as before. Draw wires to complete the electrical circuit below. [1]

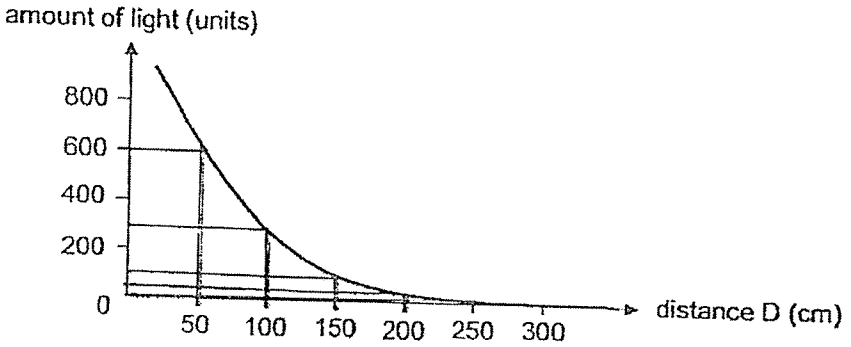


1

36. Judy carried out the experiment as shown.
She switched on a torch and placed it in a long cardboard tube. She adjusted the position of the torch in the cardboard tube with a stick. She then recorded the amount of light detected by the light sensor when she moved the torch away from it.



The graph below shows her results.

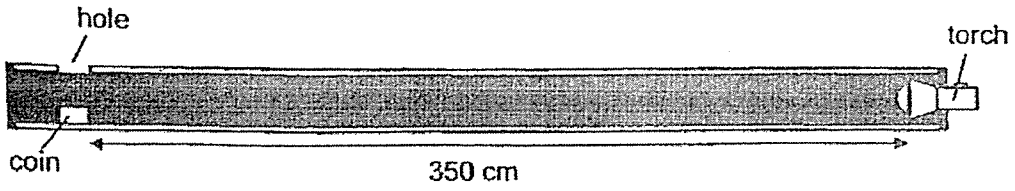


(a) State the relationship between the amount of light detected by the light sensor and distance D.

[1]

1

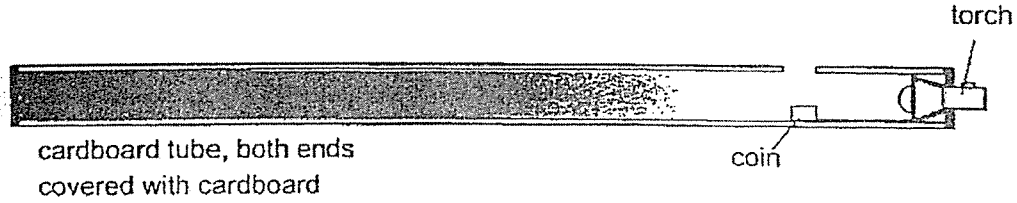
Judy placed the same torch in a similar cardboard tube as shown. There was a hole in the tube and a coin was placed directly below it.



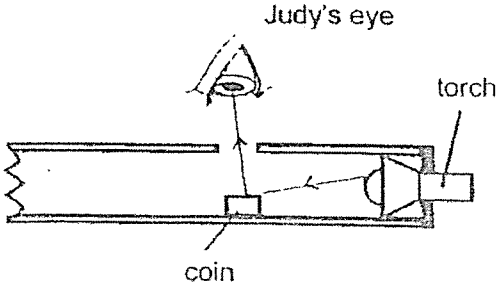
Judy switched on the torch but could not see the coin when she looked through the hole.

(b) Based on her graph, explain why Judy could not see the coin. [2]

Judy placed the same torch in another similar cardboard tube as shown. She switched on the torch and this time, she was able to see the coin in the pipe through the hole.

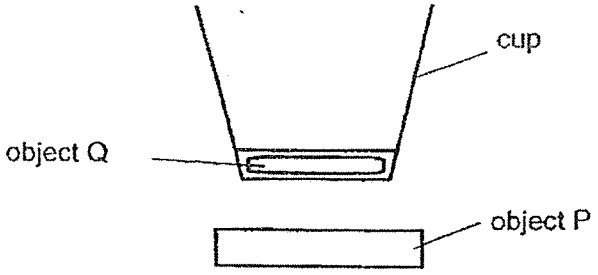


(c) Draw light rays in the diagram <u>below</u> to show how Judy was able to see the coin. [1]



3

37. Mr Lee served a drink in a cup with object Q in its base. When the cup is placed above object P, it floats as shown.



(a) Explain his observation. [2]

The table shows how the amount of water added to the cup affects the distance between the cup and object P.

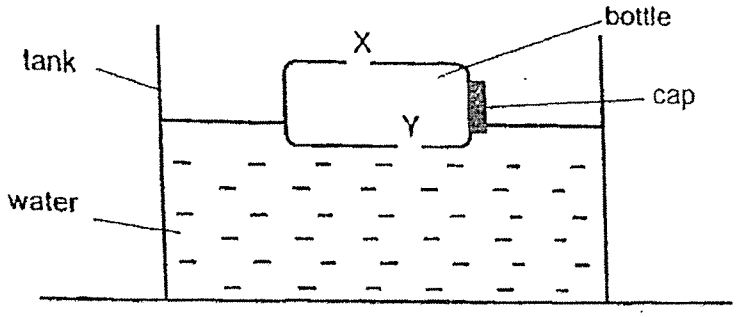
Amount of water (cm^3)	Distance between the cup and object P (cm)
0	5
100	3
200	1

(b) What is the distance between the cup and object P when 300cm^3 of water is poured into it? Explain your answer in terms of forces. [2]

(c) What could Mr Lee do to ensure he gets reliable results? [1]

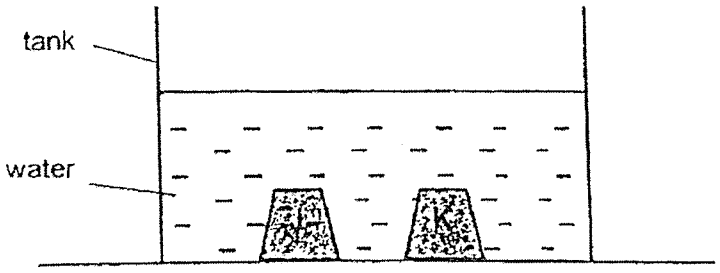
5

38. James placed an empty bottle with two holes at points X and Y into a tank of water as shown.



(a) Give a reason why the bottle sank after awhile. [1]

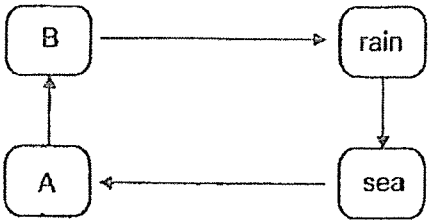
James put objects of the same size, J and K, into a tank of water. He observed that both objects sink in water as shown.



(b) Can James conclude that objects J and K were made of the same material? Give a reason for your answer. [1]

2

39. The diagram below shows the water cycle.



(a) Name the states of water at A and B. [1]

A: _____ B: _____

(b) State a similarity between boiling and evaporation. [1]

_____

_____

Mary baked a cake and took the cake tin out from a hot oven. She overturned the cake tin as shown Diagram 1. She then placed a wet towel on the overturned cake tin as shown Diagram 2.

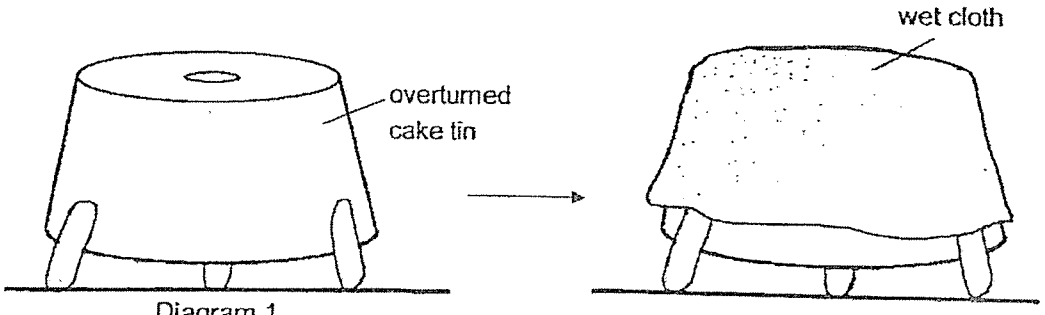


Diagram 1
(overturned cake tin)

Diagram 2

(c) Explain how placing a wet cloth over the cake tin would allow the cake to cool down faster. [2]

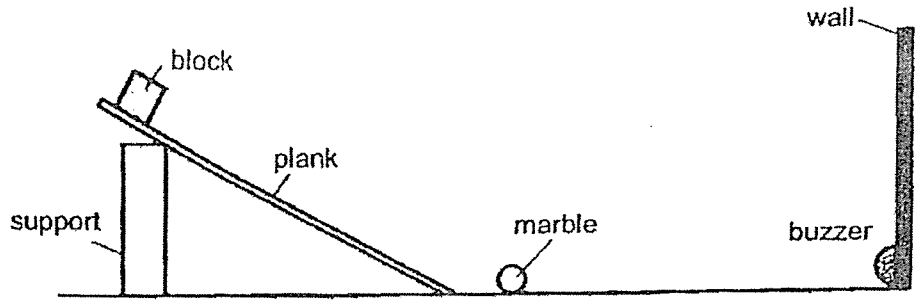
_____

_____

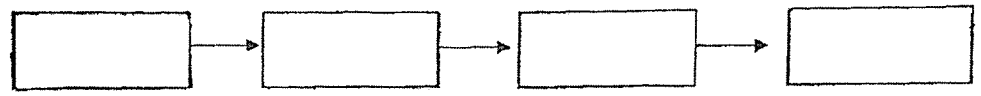
_____

4

40. Siti played a game at the funfair as shown below where she will need to release the block at the top of the ramp. Siti will win a prize if the marble hits the buzzer and makes a sound.



(a) Fill in the boxes below to show the energy changes that cause the buzzer to sound. [1]



of the block at the top of the plank

of the block rolling down the plank

of the marble after being hit by the ~~ball~~ block

of the buzzer

Siti was given a choice of three blocks, A, B and C, of the same size but of different masses.

Block	A	B	C
Mass (g)	50	80	20

On her first try, she picked block A. The marble touched the buzzer but the buzzer did not make a sound.

(b) Which block should Siti use to increase her chances of winning a prize? Explain your answer in terms of energy changes. [2]

END OF PAPER

3