GRADE SOLUTION
LEARNING CENTRE

PRIMARY 6

Science Mid-Year Mock Exam

Name : _____

Date: _____

Section A	**/56**
Section B	**/44**
Total	**/100**

Write out your MCQ answers on this page.

1	2	3	4	5	6	7	8	9	10

11	12	13	14	15	16	17	18	19	20

21	22	23	24	25	26	27	28

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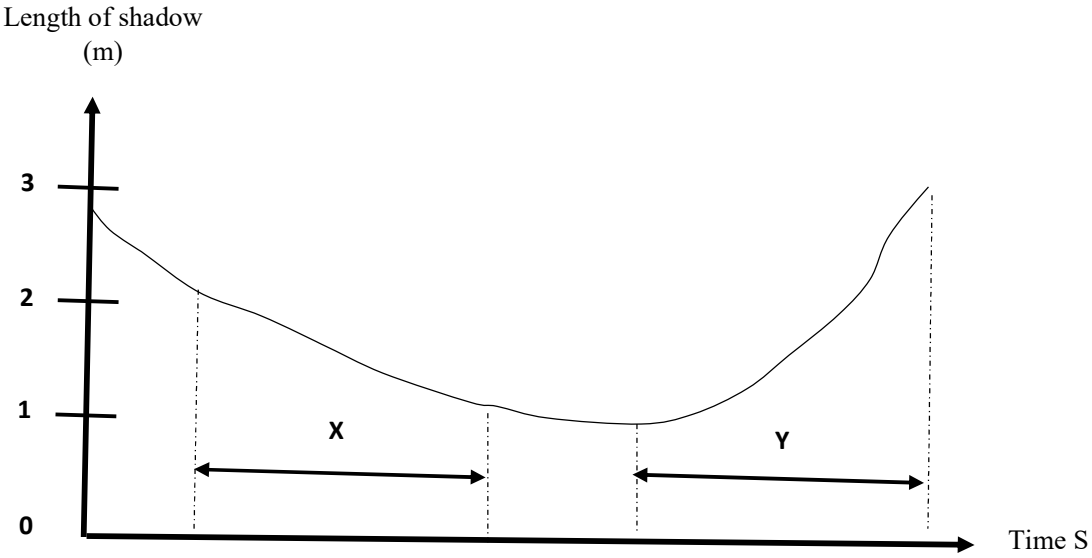
Section A (28 x 2 mark= 56 marks)

For each question from 1 to 10, four options are given. One of them is the correct answer.

---

1) Study the graph below. Mary's shadow changes as she walks in a straight line near a street lamp at night.



Based on the graph, which of the following conclusions are possible?

(A) Daisy is walking towards the lamp during period X.
(B) Daisy is walking towards the lamp during period Y.
(C) Daisy is walking faster during period X than period Y.
(D) Daisy is walking faster during period Y than period X.

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

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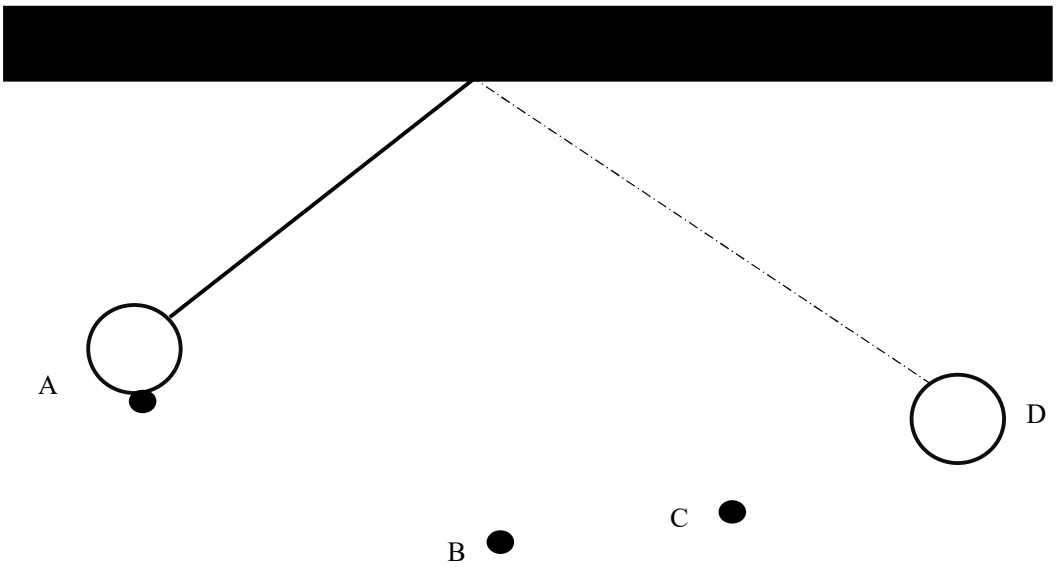
2) In the setup below, John held the ball at Position A and released it. The dotted line shows the path of the ball swinging from Position A to Position D at first swing.



Which one of the following graphs best represents the changes in kinetic energy and potential energy from Position A to Position C?

Please turn over to the next page for the options.

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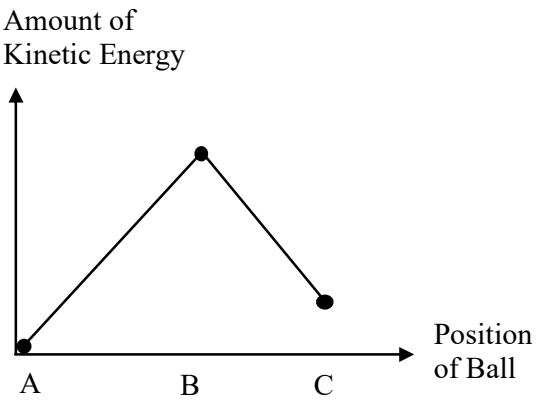
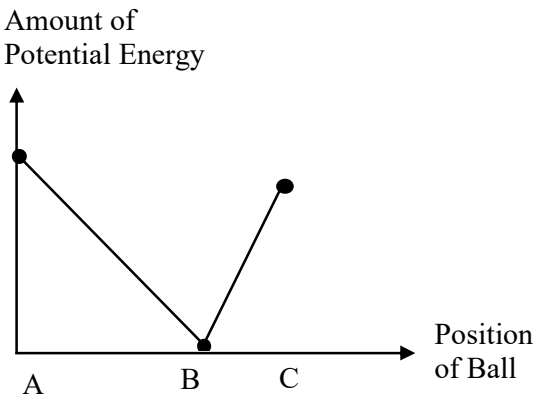
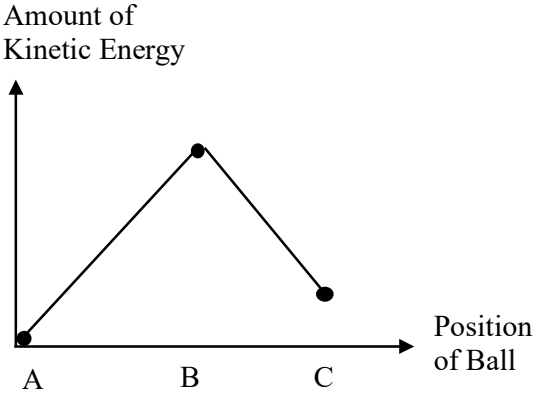
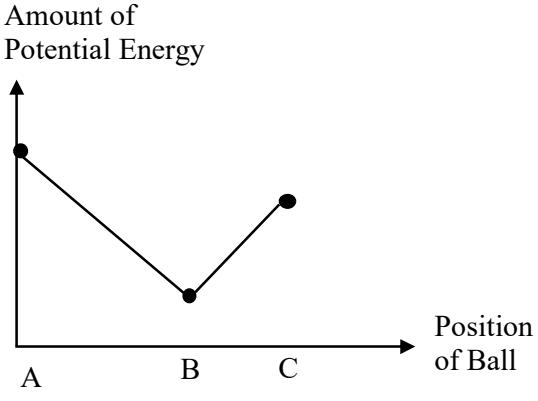
(1)



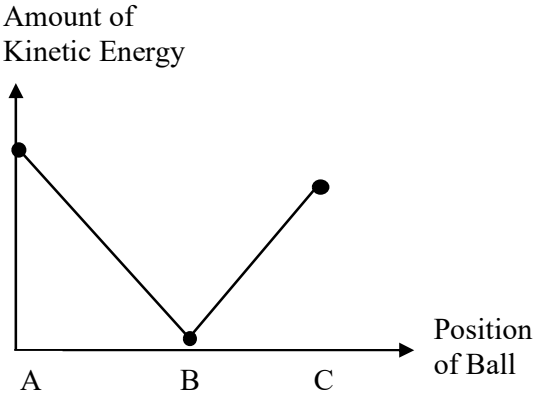


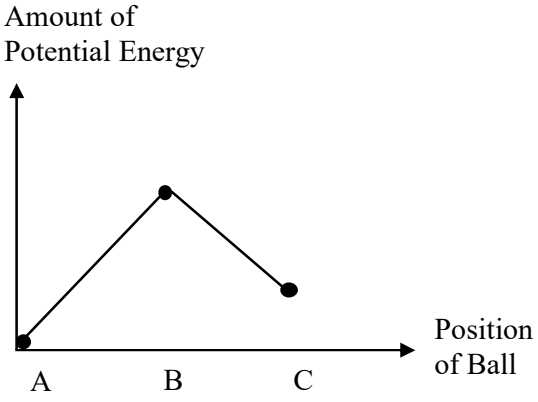
(2)



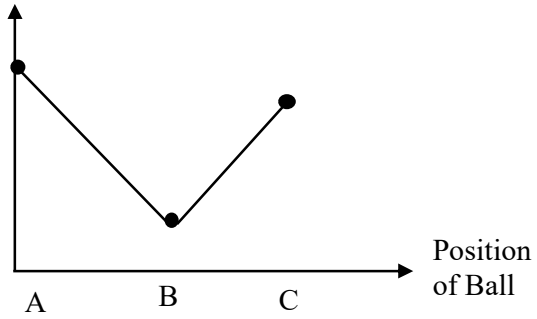


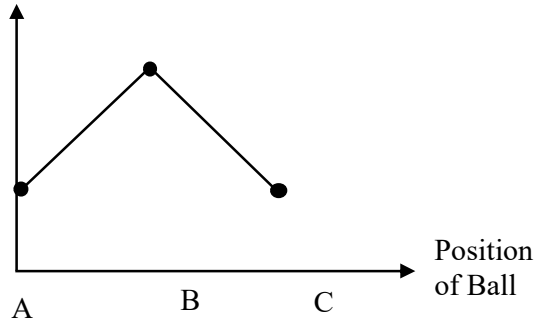
(3)





(4)





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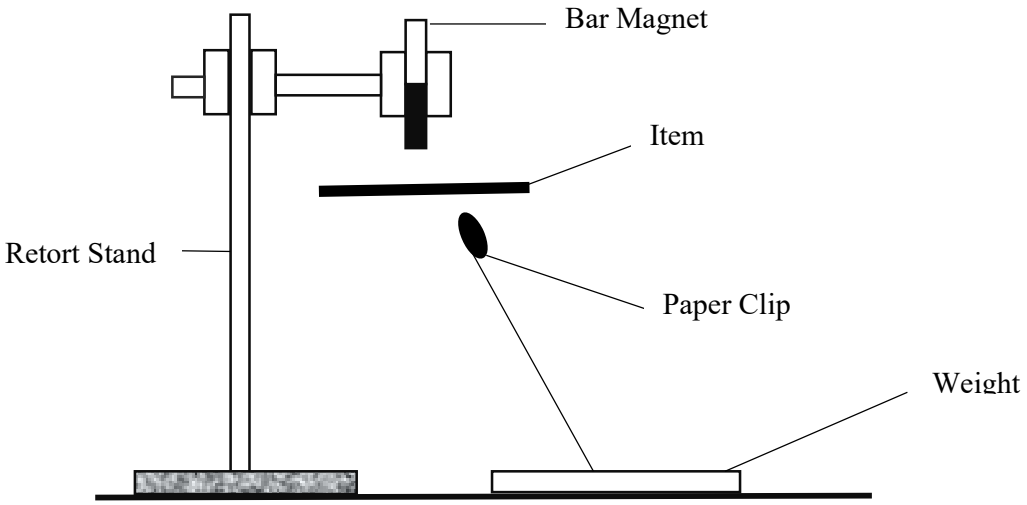
3) Tom conducted an experiment as shown below. He held a bar magnet above a paper clip which was tied to a weight by a string. The magnet attracted the paper clip without touching it. Then he placed four items, one at a time, between the magnet and the paper clip and observed if the paper clip dropped or remained where it was.



If the four items used in the experiment were a thin sheet of steel, a piece of aluminium foil, a piece of paper and a thin sheet of gold respectively, which one of the following observations would correctly show that magnetic force can only pass through a non-magnetic material?

	Steel	Aluminium foil	Paper	Gold
(1)	Remained	Dropped	Dropped	Remained
(2)	Remained	Remained	Dropped	Remained
(3)	Dropped	Dropped	Remained	Dropped
(4)	Dropped	Remained	Remained	Remained

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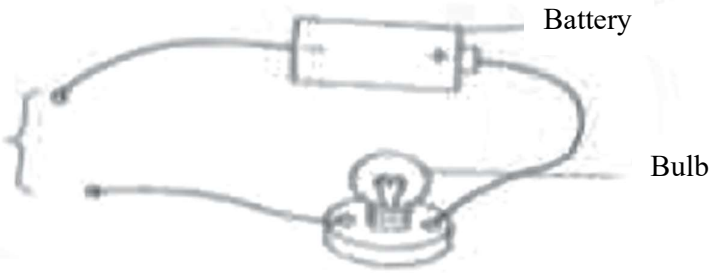
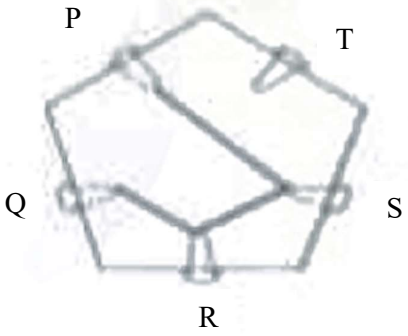
4) A circuit tester is used to find out if electricity flows in a circuit. The diagram below shows a circuit tester which is in good working condition.

End of the wires to the connected to the paperclips on the circuit card



Circuit Tester

Lucas used the above circuit tester to test the circuit conditions on the circuit card as shown in the diagram below.



Circuit Card

Which of the following combinations of paperclips tested would cause the bulb in the circuit tester to light up?

A. P and R
B. Q and T
C. Q and S
D. S and T

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

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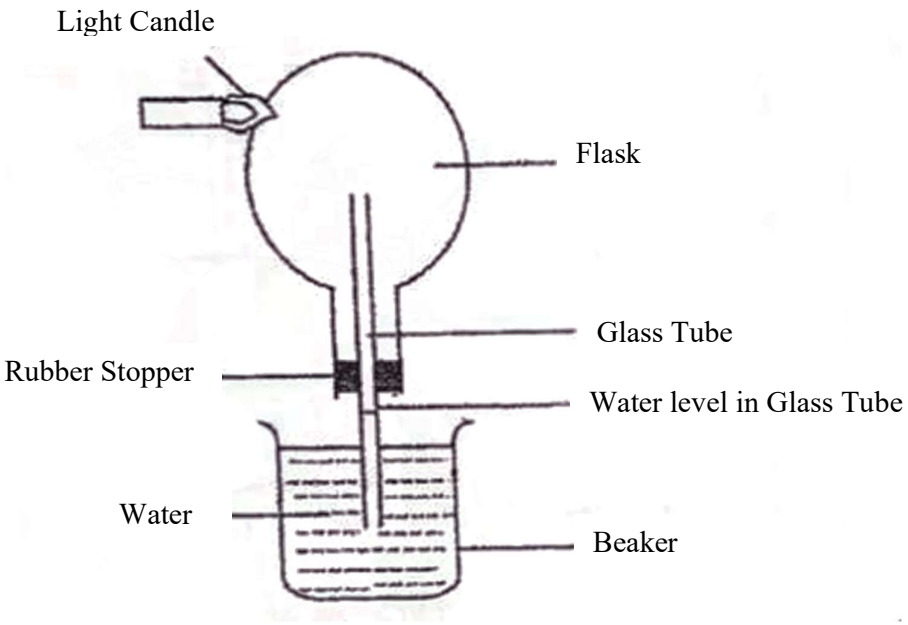
5) David created a set-up as shown. He used a lighted candle to heat the flask for seven minutes.



What change did he observe about the water level in the glass tube during the **next** five minutes?

(1) It increased.
(2) It increased and then decreased.
(3) It decreased.
(4) It remained the same.

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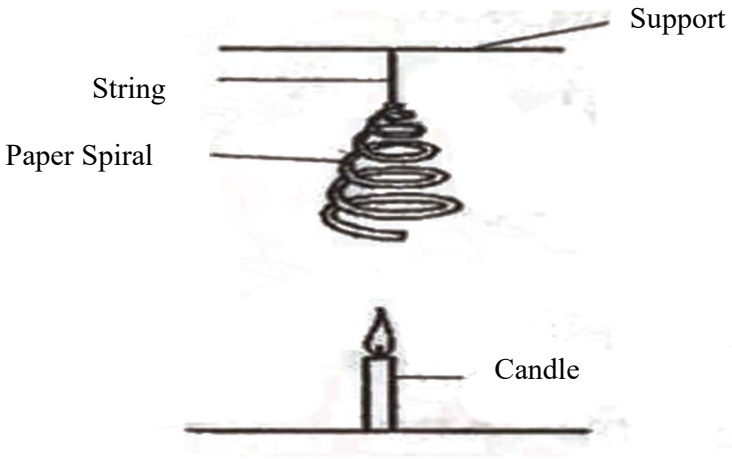
6) John was in a display shop and he saw the setup as shown below.



What is the energy that causes the paper spiral to spin?

(1) The light energy from the flame.
(2) The heat energy from the flame.
(3) The kinetic energy of the hot air.
(4) The Chemical potential energy from the candle.

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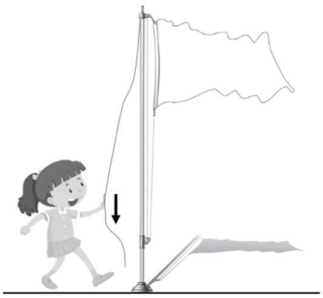
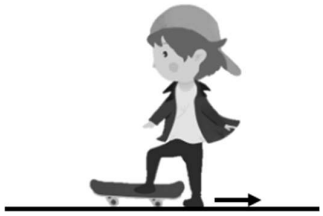
7) Which of the following arrows shows the effect of a pushing force?

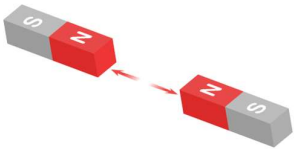
A)



B)



C)



D)

(1) A and B only

(2) B and C only

(3) A, B and C only

(4) A, B, C and D only

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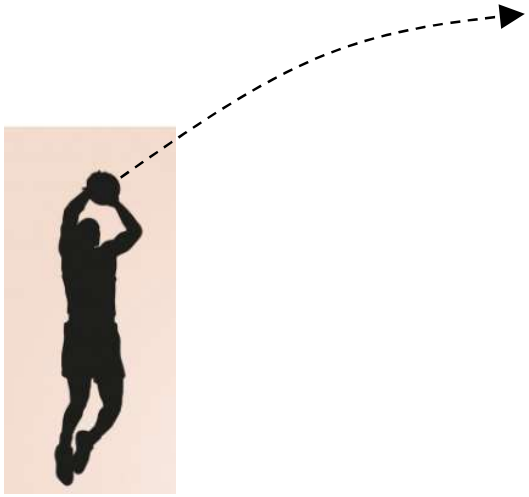
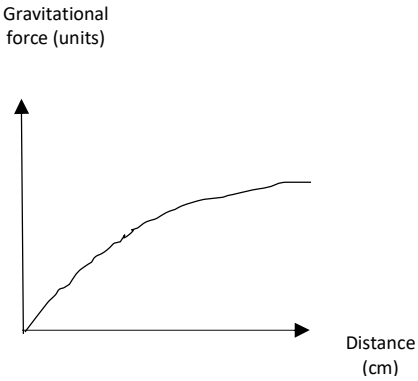
8) Michael throws a basketball as shown in the diagram below. The arrow shows the path of the basketball.

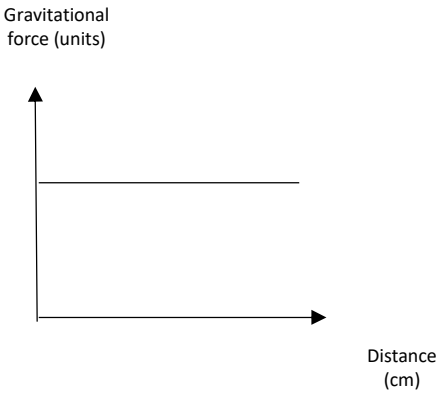


Which of the following graphs shows the most likely relationship between the gravitational force acting on the basketball and the distance of the basketball from the ground.

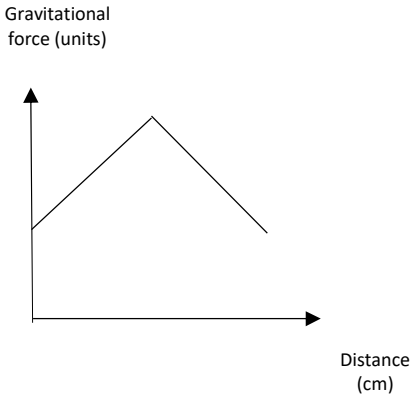
(1)



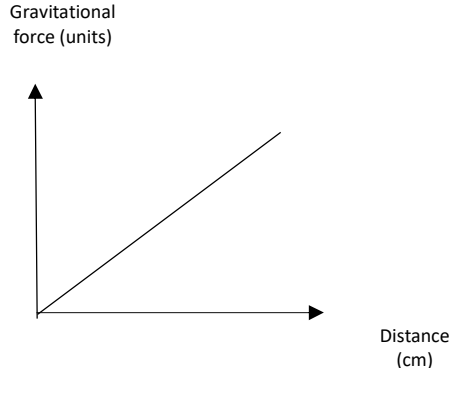
(2)



(3)

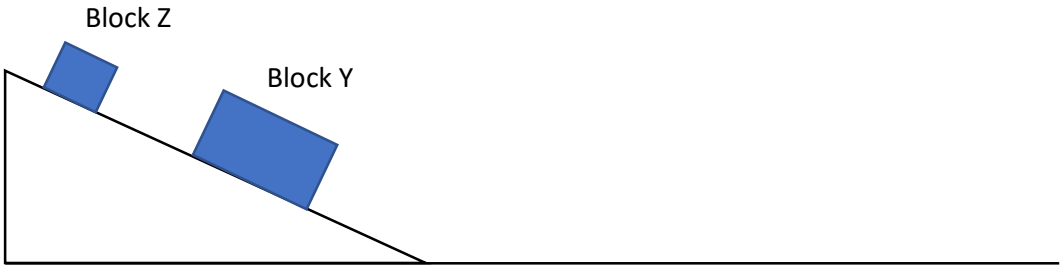


(4)



Ans: 2

9) Jun Hao placed 2 plastic blocks, Y and Z, at different positions on a slope. Block Y is bigger than Block Z, but both blocks have the same mass.



Jun Hao made the following statements:

A There are no forces acting on the plastic blocks.
B There is no frictional force acting on the blocks when they slide down the slope.
C There is no frictional force acting on the blocks when they are not moving.
D The gravitational force acting on Block Y and Block Z are the same.

Which of the following statements is/are correct?

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

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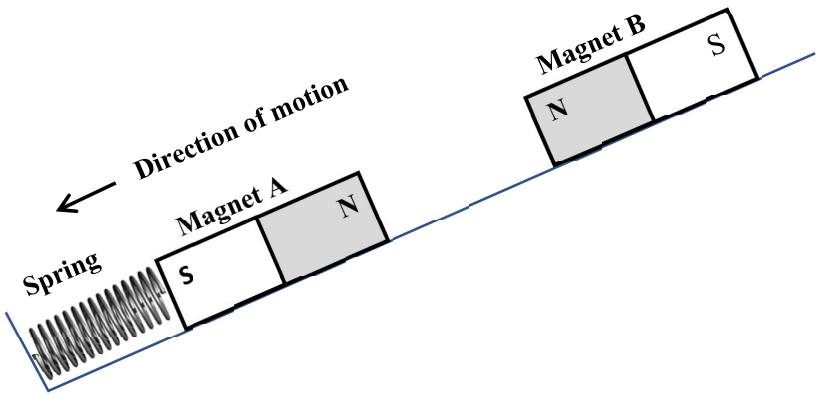
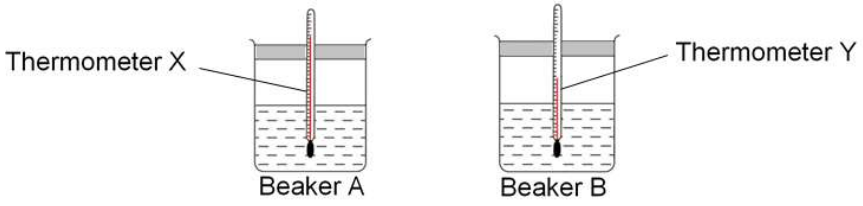
10) Magnet A is attached to a spring in the set-up below. Magnet B is then brought near to Magnet A. This causes Magnet A to slide down the ramp and compress the spring, as shown below.



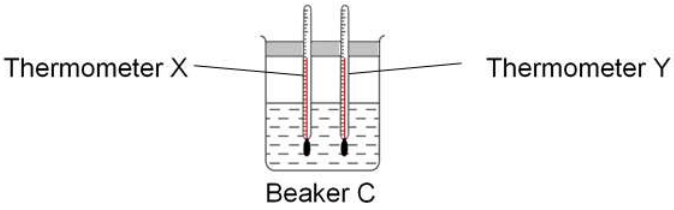
Which of the following options correctly identifies the forces acting on Magnet A and the direction of these forces?

	Magnetic force	Elastic spring force	Friction	Gravitational Force
(1)	↗	↗	↙	↙
(2)	↙	↗	↗	↓
(3)	↗	↙	↙	↓
(4)	↙	↗	↗	↙

11) Isaac had three beakers, A, B and C, each containing the same amount of water but at different temperatures. He first placed a thermometer into each beaker, A and B, as shown below.



After two minutes, Isaac placed both thermometers into Beaker C as shown below.

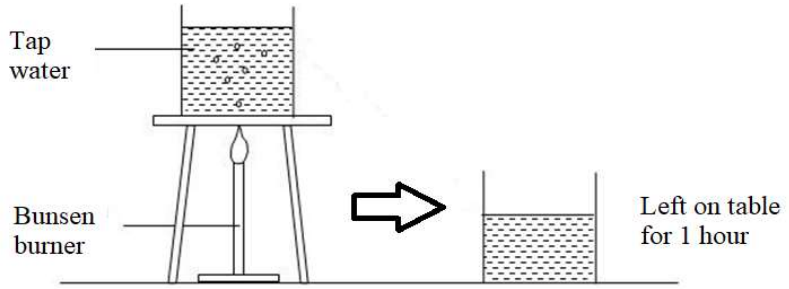


He observed that the reading of thermometer X decreased while that of thermometer Y increased.

Which one of the following shows the temperature of water in the three beakers, A, B and C, arranged from the lowest temperature to the highest temperature?

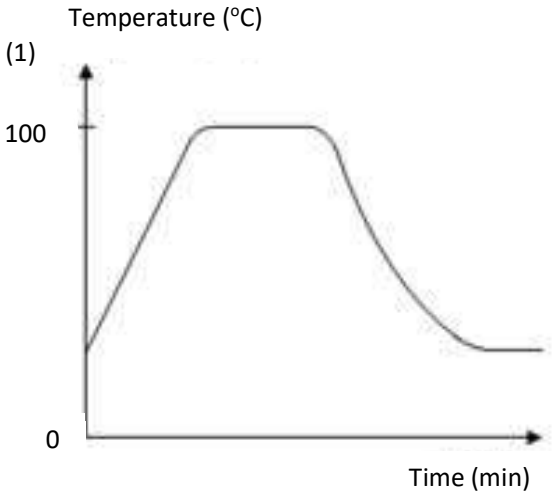
	Temperature of water in beaker		
	Lowest → Highest		
(1)	A	B	C
(2)	B	C	A
(3)	C	A	B
(4)	A	C	B

12) Dennis heated a beaker of tap water and left the water to boil for 5 minutes. He then placed the beaker of water on the table for an hour.

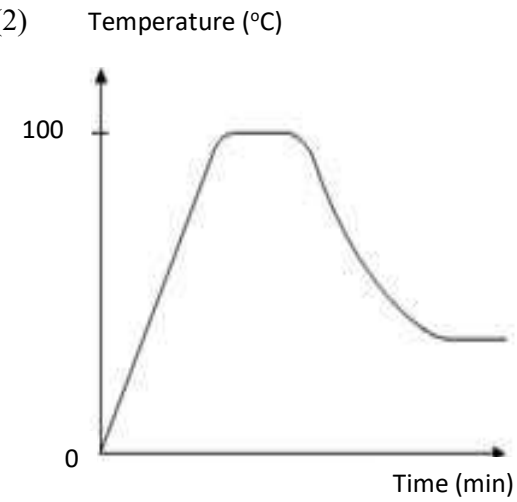


Which one of the graphs below best describes the changes in temperature of the water from the start till the end of the experiment?

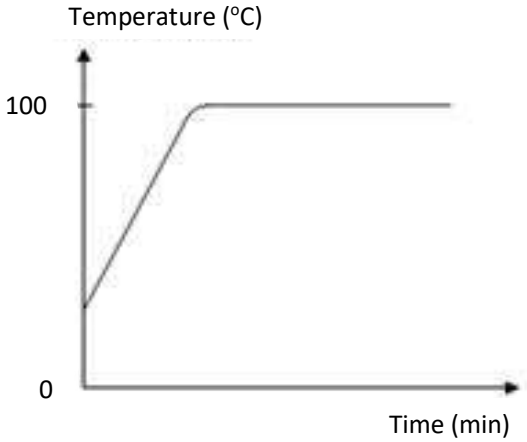
(1)



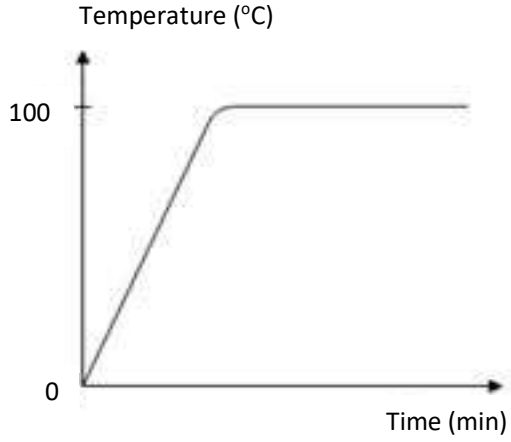
(2)



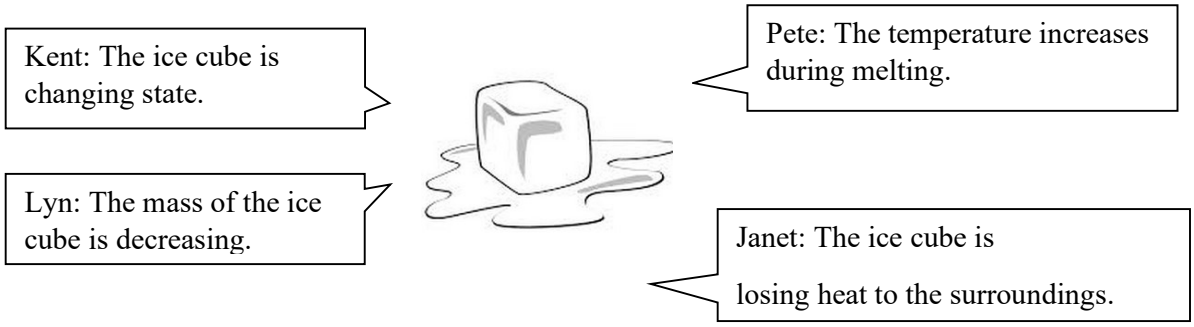
(3)



(4)



13) Four children made the following comments while observing a cube of ice on a table.



Which child/ children has/have made a **wrong** comment about the melting process?

(1) Kent

(2) Lyn and Pete

(3) Kent and Lyn

(4) Pete and Janet

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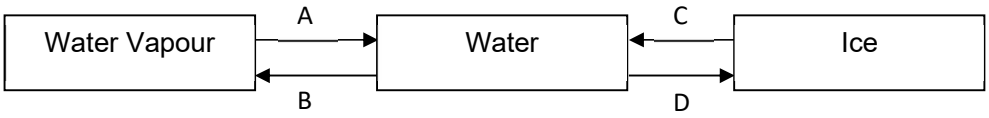
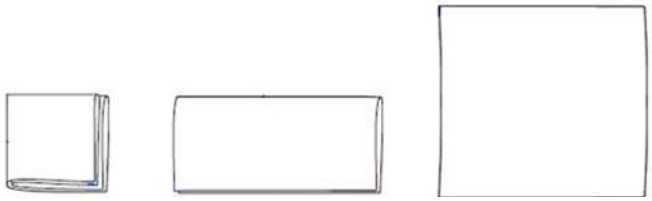
14) Study the diagram below.



A, B, C and D represent different processes. In the table below, which letters represent evaporation and condensation?

	Evaporation	Condensation
(1)	C	B
(2)	B	A
(3)	D	C
(4)	A	D

15) Joseph wanted to find out how the exposed surface area of the towel affects the rate of evaporation of water. Using three identical towels, X, Y and Z, he folded X twice, Y once, and left Z unfolded, as shown below. He then poured the same volume of water onto each towel and left the towels in the same location to dry for half an hour.



X (Folded twice) Y (Folded one time) Z (Not folded)

He weighed each towel at the end of the experiment and tabulated his results below.

Towel	Mass after 30 min
X	185 g
Y	100 g
Z	67 g

What conclusion can Joseph draw from his results?

(1) As the number folds of the towel increases, the mass of water remaining in the towel decreases.

(2) As the number folds of the towel increases, the mass of the towel at the end of the experiment increases.

(3) The smaller the exposed surface area of the towel, the faster the rate of evaporation of water.

(4) The larger the exposed surface area of the towel, the faster the rate of evaporation of water.

( )

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16) The statements below describe substance P at different temperatures.

- At 20°C, it has a definite shape and volume.
- At 102°C, it does not have a definite shape but has a definite volume.
- At 148°C, it can be compressed.

Which one of the following shows the possible melting point and boiling point of substance P?

	Melting Point (°C)	Boiling Point (°C)
(1)	0	100
(2)	10	102
(3)	22	100
(4)	25	145

( )

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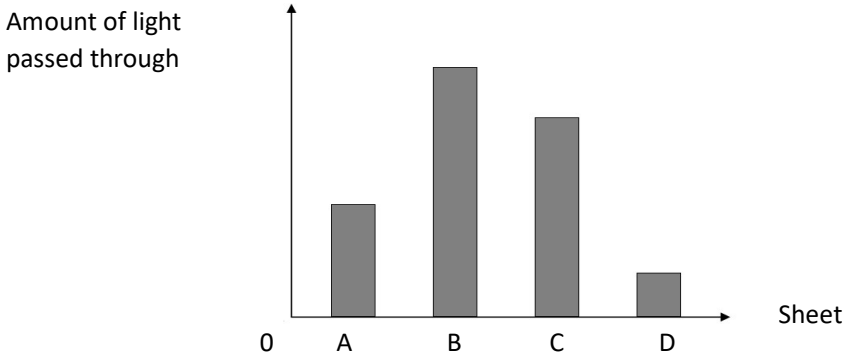
17. Zac used a light sensor to find out how much light passed through four sheets, A, B, C and D, each made of a different material but of similar size and thickness. He drew the graph below to show his results.



Which sheet would cast the darkest shadow?

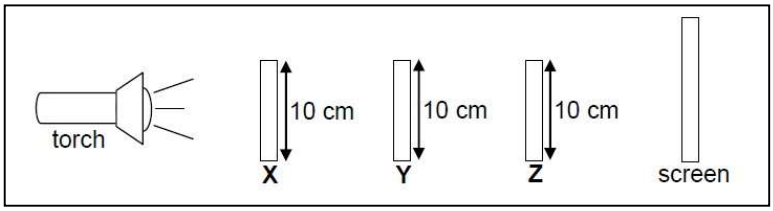
(1) A

(2) B

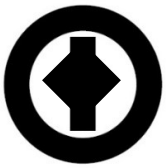
(3) C

(4) D

18. Three objects X, Y and Z are made of similar materials and arranged in a straight line as shown below.



The diagram below shows the shadow formed on the screen.



Which one of the following correctly identifies Objects X, Y and Z?

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

19. Janet recorded the lengths of 2 springs, S and T, first without a load and then when loads of different masses were hung on them. Her readings are shown in the table below.

Mass of load (g)	Length of Spring S (cm)	Length of Spring T (cm)
0	8	8
100	13	11
200	18	14
300	23	17

Which one of the following statements about the spring is true?

(1) When both springs are stretched to the same length, Spring T can be stretched using less force compared to Spring S.

(2) Spring T it is stiffer than Spring S.

(3) Spring S extended less than Spring Y when the same load was hung on it.

(4) Both Spring S and Spring T stretched more than 12 cm when a load of 200g was hung on them.

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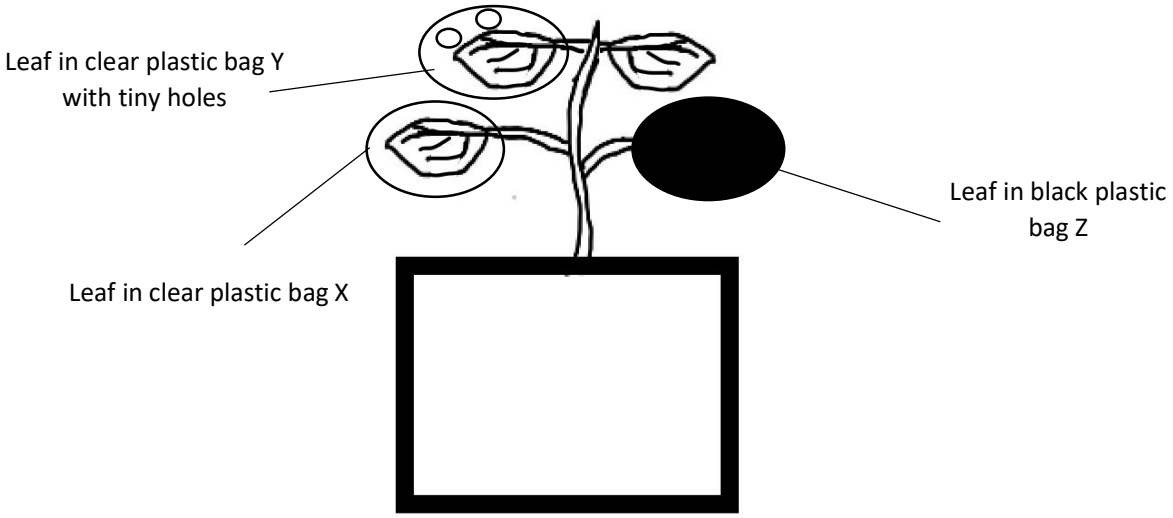
20) David set up an experiment as shown below. He wrapped three similar leaves on a plant with three different type of plastic bags, X, Y and Z. The plastic bags were of the same size. He left the plant under the open field for several hours.



	Amount of oxygen in the plastic bag		
	X	Y	Z
(1)	No change	Increase	Increase
(2)	Increase	Increase	Decrease
(3)	Decrease	No change	Decrease
(4)	Increase	No change	Decrease

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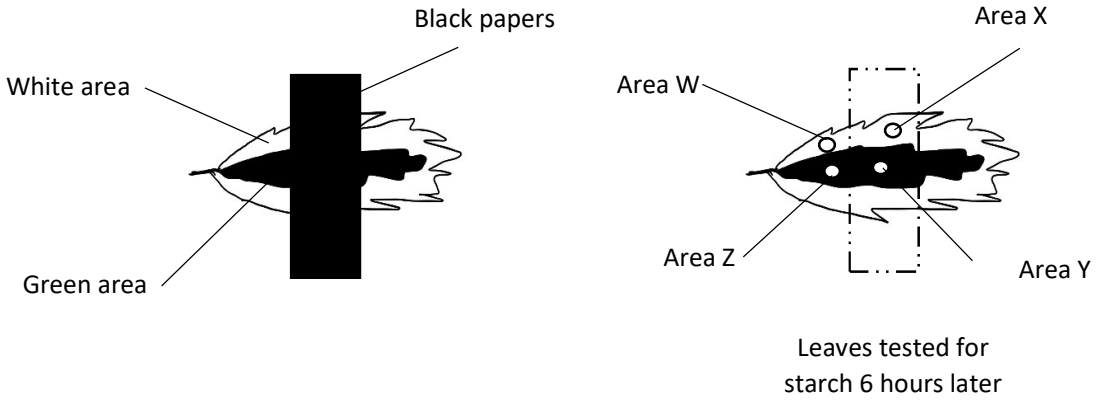
21) Nathan wants to investigate the factors necessary for photosynthesis to take place. He placed the plant in a dark place for 24hours.

He attached a black paper to both sides of a leaf and placed the plant in bright sunlight. After 6 hours, he cut similar size areas (W, X, Y and Z) from different parts of the leaves and test them for starch.



Which areas (W, X, Y or Z) must they choose to investigate the effect of light and the effect of chlorophyll on photosynthesis?

	To find out the effect of chlorophyll on photosynthesis	To find out the effect of light on photosynthesis
(1)	W and X	Y and Z
(2)	Y and Z	W and X
(3)	Z and W	Y and Z
(4)	W and Z	W and Y

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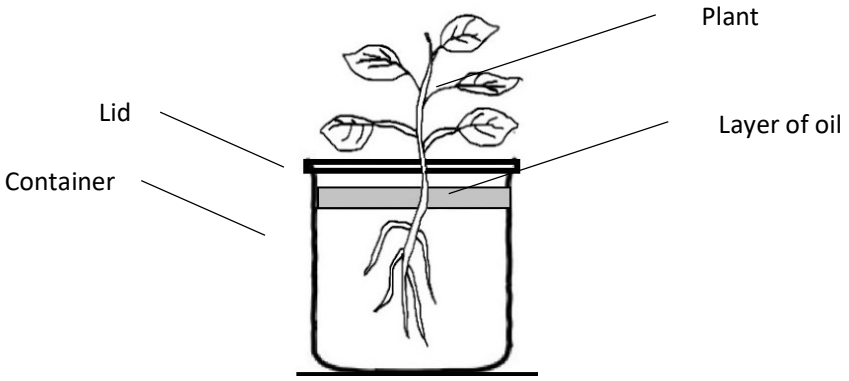
22) Mary wants to find out how covering the leaves with black paint affects the rate of photosynthesis for the plant. An experiment was conducted using four similar plants, A, B, C and D with the same number of leaves. Each plant was placed in a container as shown in the diagram below.



A plant has three leaves covered with black paint. Another plant has four leaves covered with black paint. Yet another plant has all five leaves covered with black paint. The last plant has leaves not covered with black paint.

Plant	Mass of plant (g)	
	At the start of the experiment	After 6 days
A	300	250
B	300	285
C	300	370
D	300	200

Which of the plants had their leaves coated with black paint?

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

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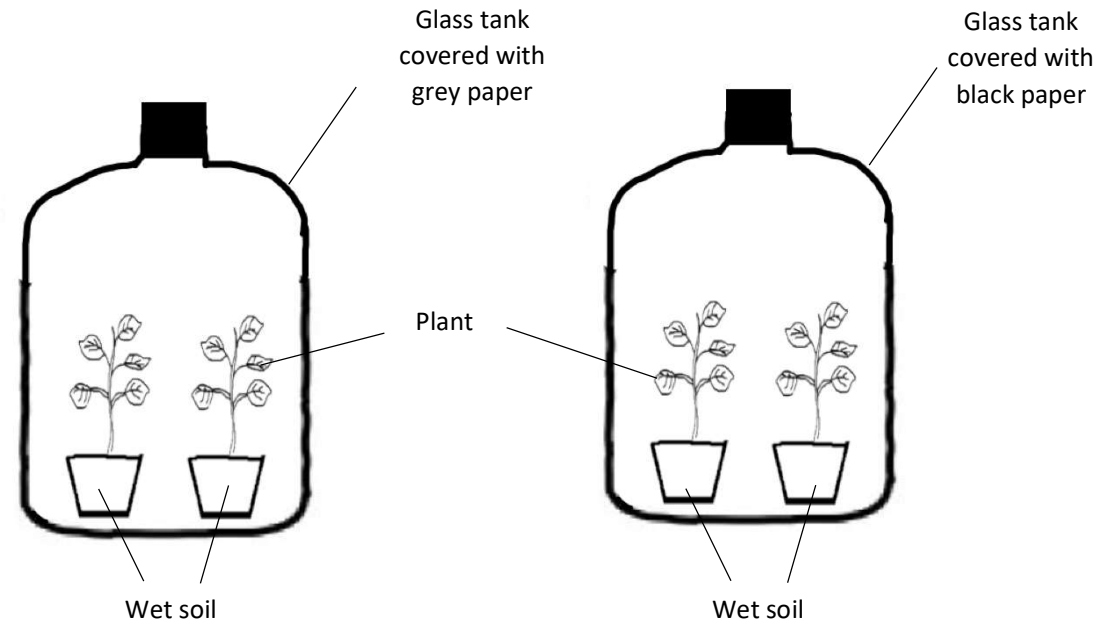
23) Fatimah wanted to find out how the amount of light will affect the growth of a plant. She prepared two set-ups below and placed them in a classroom.



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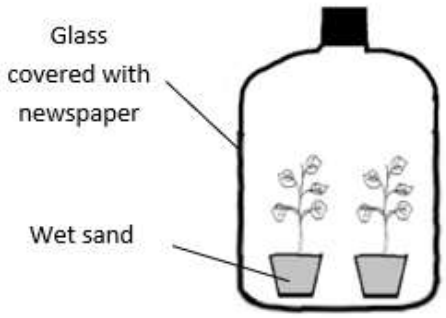
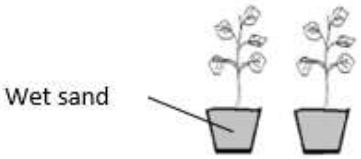
Which one of the following should Fatimah use as a control set-up?

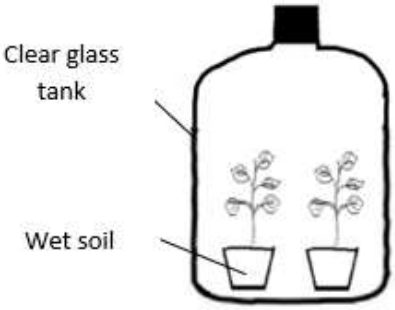
(1)



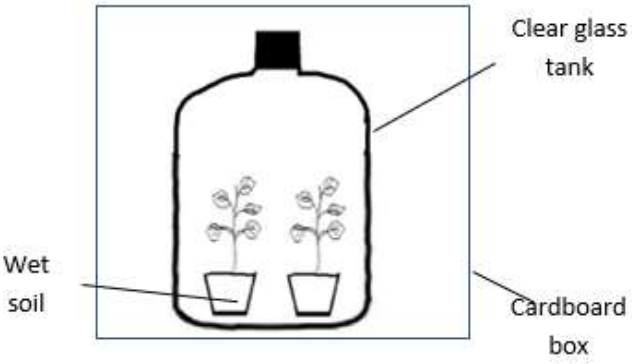
(2)



(3)

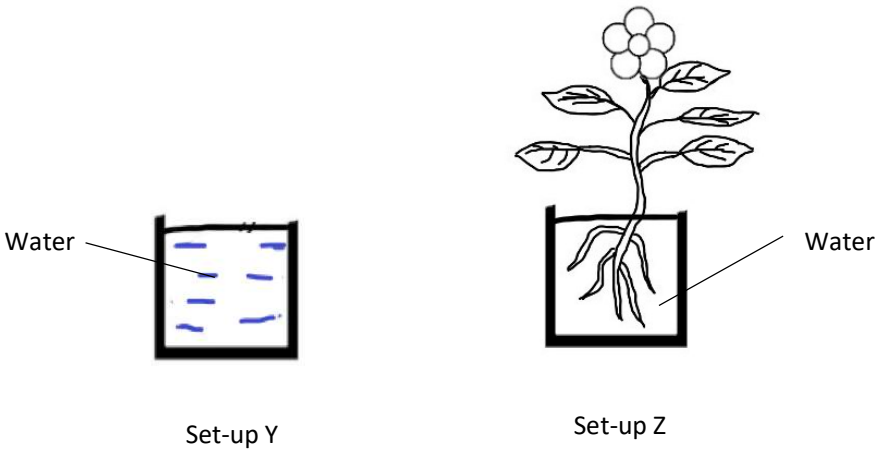


(4)



24) Paul wanted to find out how much water the roots of a plant absorb in a day.

He has prepared the set-ups shown in the diagram below and placed them in a room.



After a day, the results of his findings are shown in the table below.

Set- up	Amount of water in container (ml)	
	Start of the experiment	End of the experiment
Y	600	500
Z	600	400

Which one of the following shows correctly how much water the roots of the plant had taken in?

(1) 50ml
(2) 100ml
(3) 150ml
(4) 200ml

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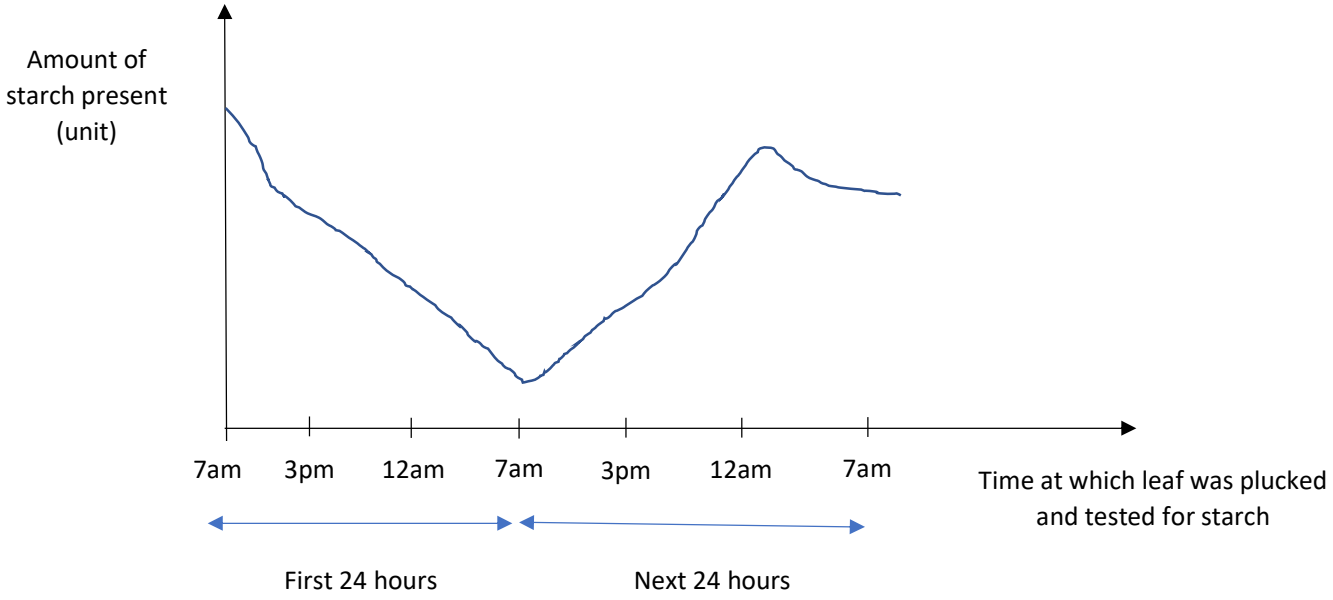
25) Jay wanted to find out the amount of starch in the leaf of a plant over a time period. He kept the pot of plant in a dark room for the **first 24 hours**, starting at 7am. He then takes out the plant from the dark room into another room beside the window for the **next 24 hours**. During every hour of the experiment, a similar-sized leaf from the plant was plucked to test for starch and the findings were recorded in the graph below.



Based on the above, which of the following correctly explains the above findings?

(1) The amount of starch decreases as the amount of light increases.
(2) The leaves photosynthesize all the time.
(3) The amount of starch increases as the amount of light increases.
(4) The amount of starch decreases as the rate of photosynthesis decreases.

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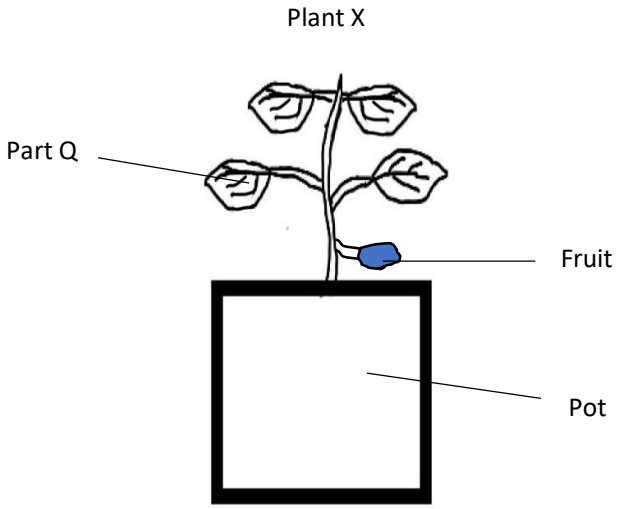
26) Gary wants to find out how the number of part Q in plant X will affect the mass of the fruit over a time.

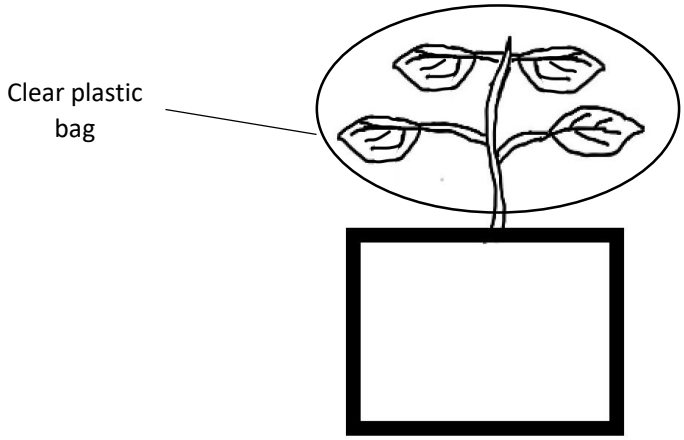


Which of the following variables should Gary keep constant so that his investigation is a fair one?

A Number of Part Q
B Amount of sunlight available
C Amount of nutrients available
D Amount of water given

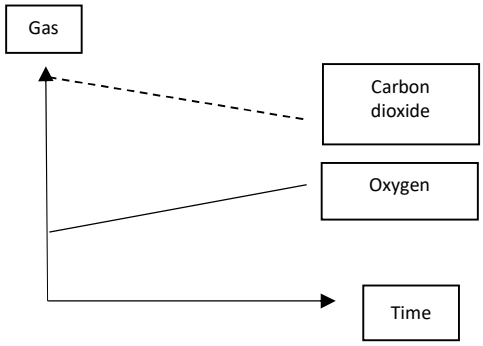
(1) A, B, C and D only
(2) C and D only
(3) B, C and D only
(4) B and D only

27) Jane prepared the setup in her school's science laboratory. She put a plant into a clear plastic bag. She then tied the bag with a string and placed it under the Sun for a few hours.

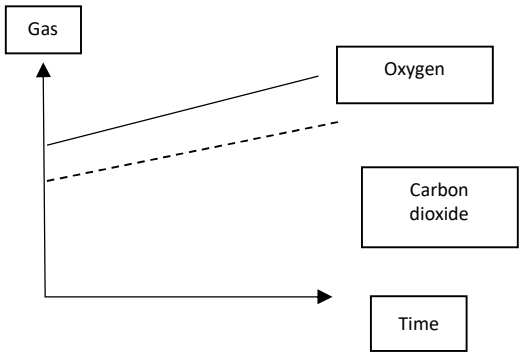


Which one of the following graphs shows the changes in the amount of carbon dioxide and oxygen in the bag during that time period?

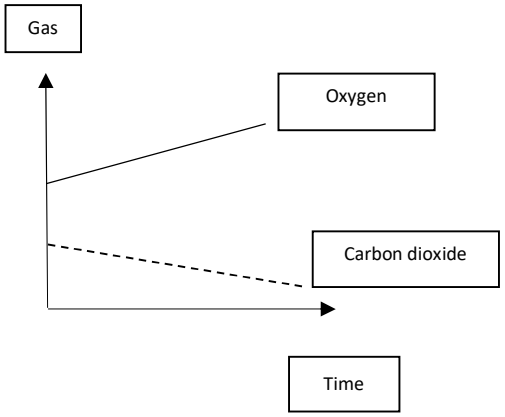
(1)



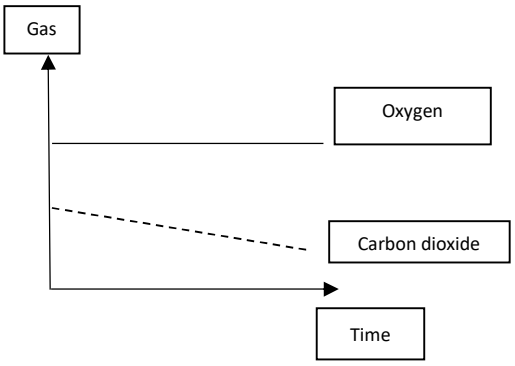
(2)



(3)



(4)



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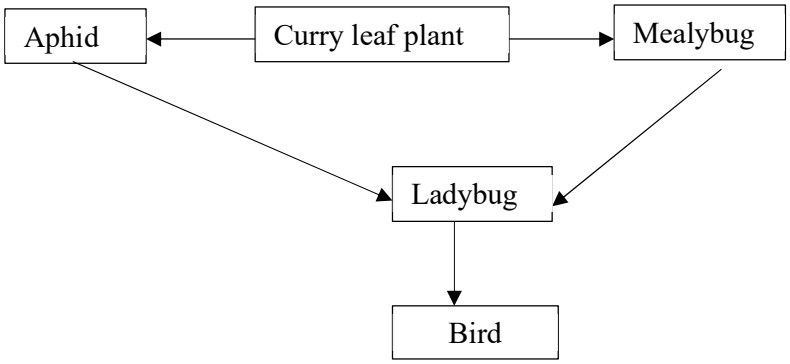
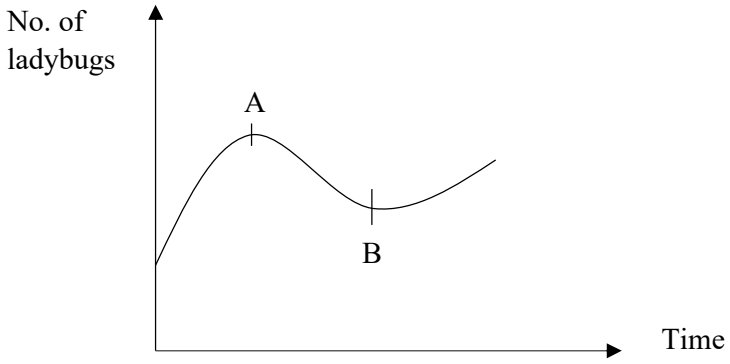
28) The food web below shows the food relationship of some organisms



The graph shows the population of ladybugs over a period of time.



Which of the following most accurately explains the change in the population of the ladybugs shown in AB in the graph?

(1) The population size of the curry leaves plant increased.
(2) The population size of aphids increased.
(3) The population size of mealybugs increased.
(4) The population of aphids and mealybugs decreased but the population size of the bird increased.

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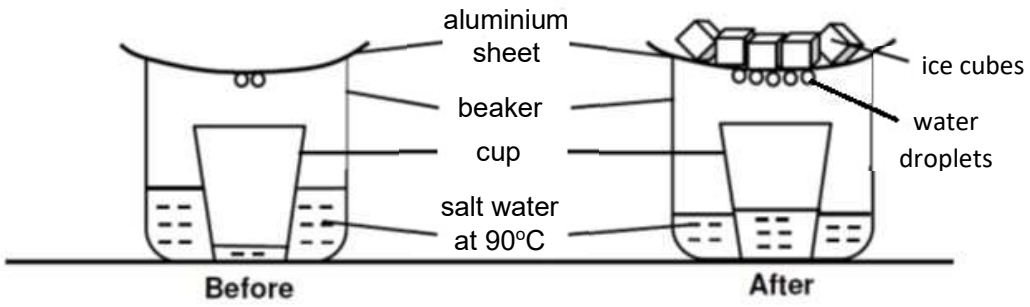
Section B
Write your answers to questions 29 to 38 in the spaces provided. Marks will be deducted for misspelt key words.

29) Sheryl used the set-ups below to obtain pure drinking water from salt water. Her teacher advised her to place ice cubes on the aluminium sheet so that more water can be collected in the cup.

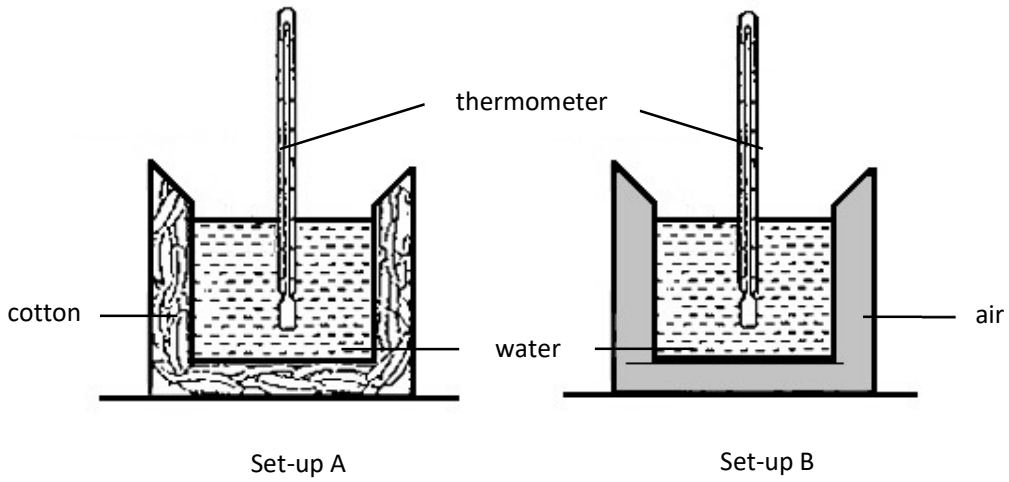


Set-up A Set-up B

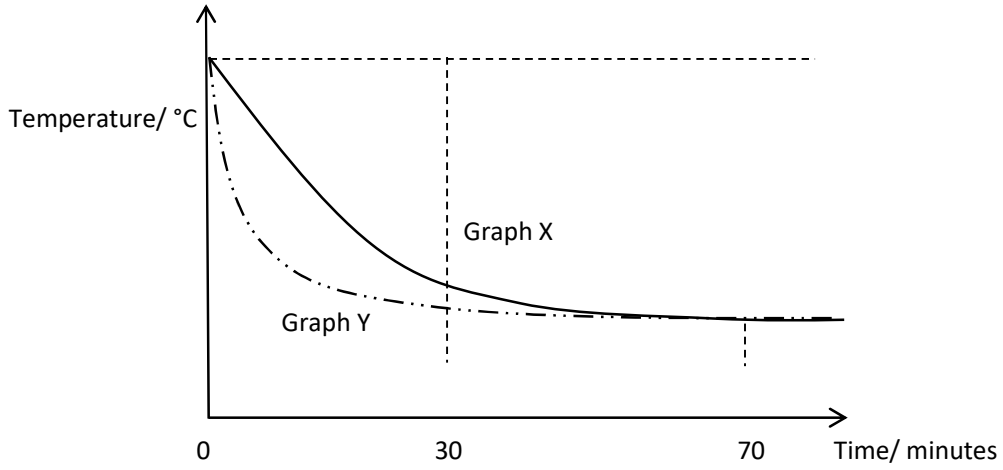
(a) Describe how water is collected in Set-up A. [2 m]

(b) Explain how placing ice cubes on the aluminium sheet in Set-up B helps to allow more water to be collected in the cup. [2 m]

30) Penny set up the experiment as shown below.



The same volume of hot water was poured into set-ups A and B and the time taken for the water in each set-up to reach room temperature was recorded in the graph below.



(a) Which graph, X or Y, represents the temperature of water in Set-up B? [1 m]

_____

(b) Give a reason why the water in Set-up B took a longer time to reach room temperature. [2 m]

_____

_____

_____

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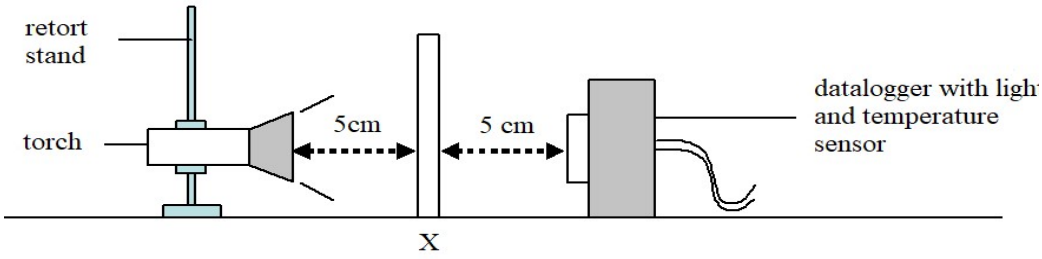
31) Andrew set up an experiment as shown below. He placed one sheet of material at a time at position X. The sheets had the same thickness but were made of different materials, A, B and C,



The set-up was placed in a dark room with a torch shining on Materials A, B or C. Andrew recorded the amount of light and temperature using a data logger in the table below.

Material	Amount of light recorded (lux)	Temperature (°C)
A	2300	40
B	1250	36
C	0	30
No Material	2300	42

(a) Based on the results above, what can Andrew conclude about the ability of materials A, B and C to let light pass through? [1 m]

(b) What is the relationship between the amount of light that passed through the materials and the temperature recorded by the data logger? [1 m]

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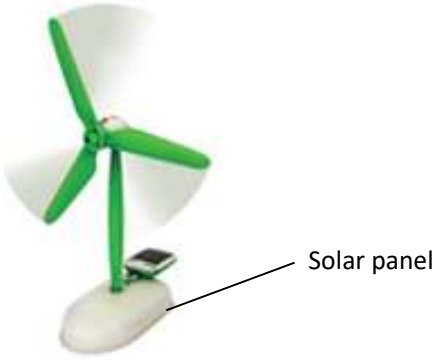
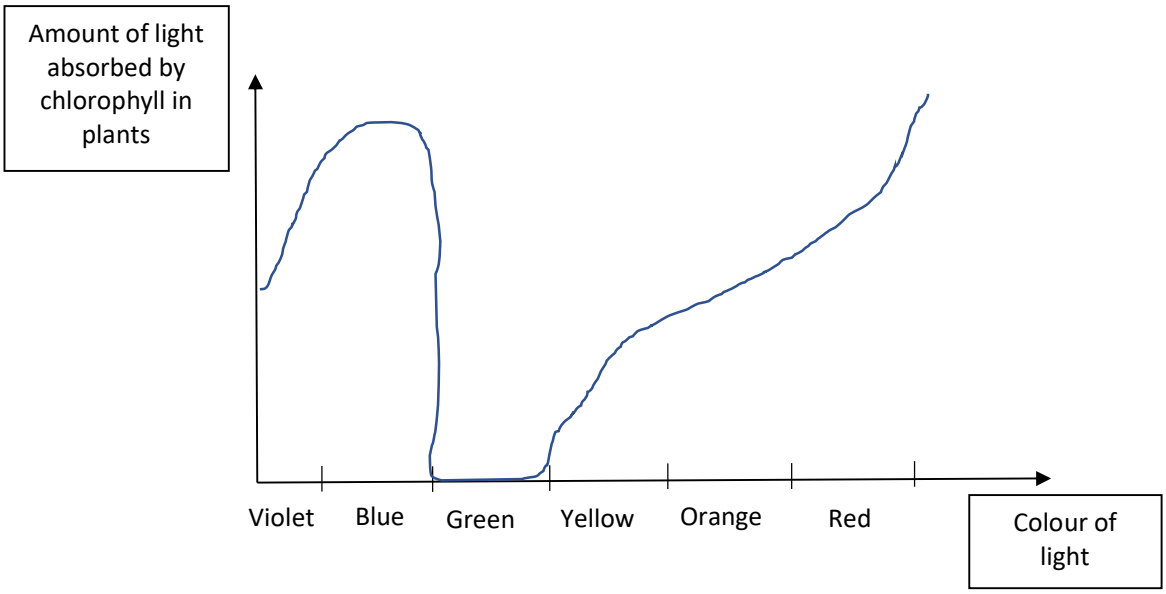
(c) The toy windmill shown below will start to spin when its solar panel, which absorbs light energy, is exposed to light.



Which material, A, B or C, should be used to make a box to keep the toy windmill so that it will **not** spin? Give a reason for your answer. [2 m]

32) The graph below shows the amount of different coloured lights absorbed by chlorophyll during photosynthesis in plants.



Two plants, X and Y, were exposed to different coloured lights. A leaf wat then plucked from each plant and tested for starch.

The results are shown in the table below.

Leaf from	Results of iodine test
Plant X	Iodine solution remained brown
Plant Y	Iodine solution turned dark blue

(a) State the colour of light plant X was exposed to. (1m)

(b) Based on the results of the experiment above, explain why we see plants as the colour stated in part (a). (1m)

_____

_____

(c) State two possible colours of light plant Y was exposed to. (1m)

_____

_____

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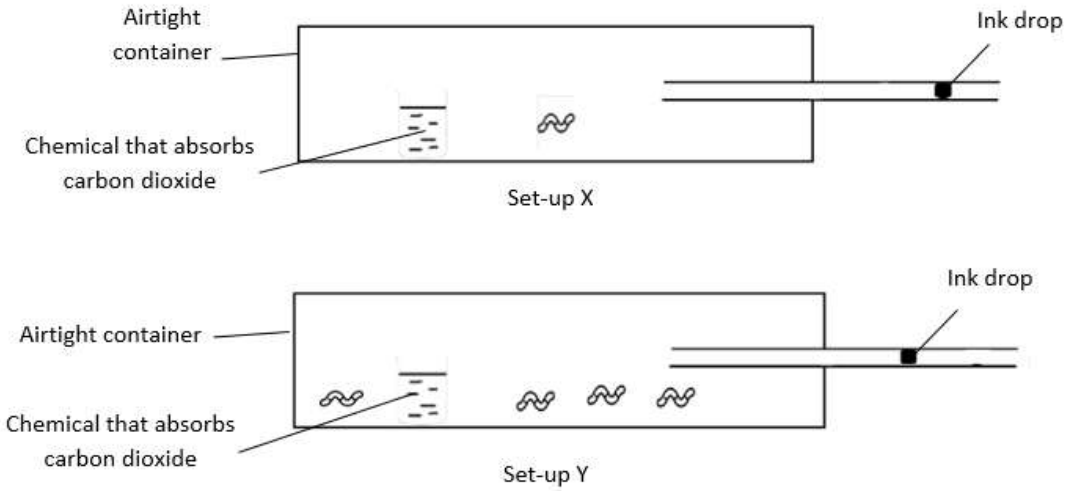
33) Andrew wanted to find out if the number of worms affects the amount of air in the container. He prepared the set-ups as shown in the diagram below. He placed one worm in set-up X and 4 worms in set-up Y.

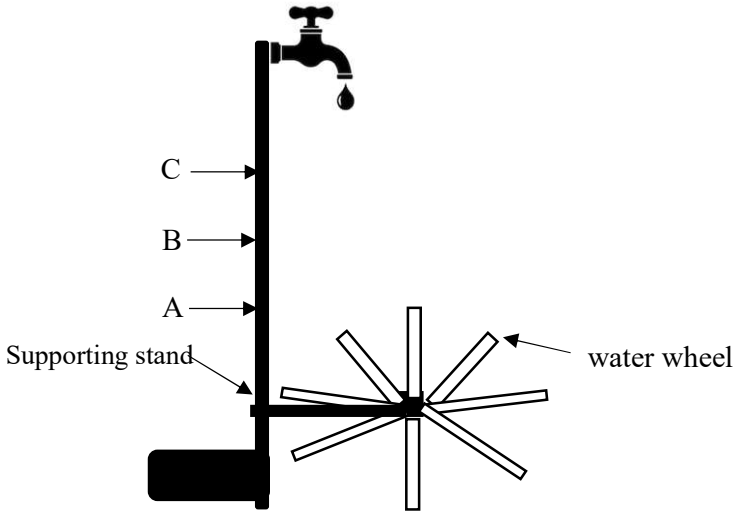


Andrew observed that the drop of ink in both set-ups moved to the left towards the container. However, the drop of ink in set-up Y moved further towards the container as compared to set-up X.

(a) Explain this observation. (2m)

(b) Suggest a control set-up to show that the change in amount of air in the container was caused by the worms. (1m)

34) Ann conducted an experiment using the set-up shown below.



Ann placed the water wheel at position A and observed the speed at which it turned. She repeated the experiment by placing the water wheel at positions B and C.

(a) At which position, A, B or C would Ann observe the water wheel to turn the fastest? (1m)

_____

(b) What can Ann conclude about the relationship between the distance between the tap and water wheel, and the speed which the water wheel spins? (1m)

_____

_____

(c) Explain your answer for (b). (2m)

_____

_____

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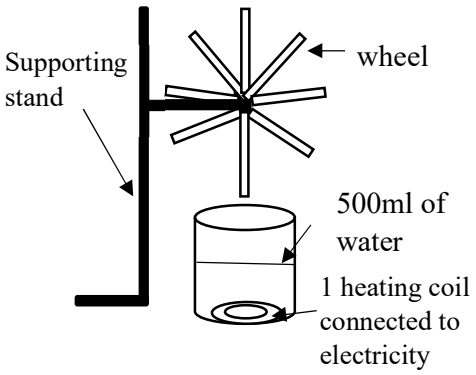
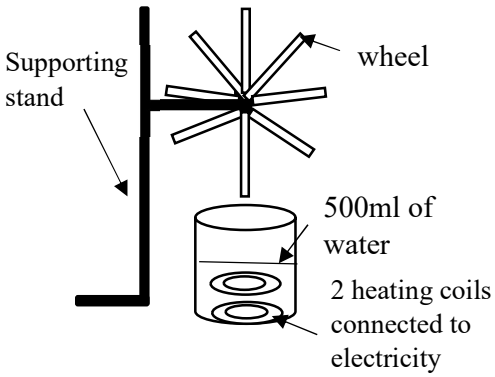
35) Susan conducted an experiment as shown in the diagrams below. The heating coils were switched on and both containers of water were heated to 100℃.



Set-up A



Set-up B

(a) State the energy conversion in the experiment. (2m)

Energy → Energy of heating coil → Energy of water

→ Energy of steam → Energy of wheel

(b) What will Susan observe about the speeds at which the wheels in both set-ups turn? (1m)

_____

(c) Explain your answer for (b). (2m)

_____

_____

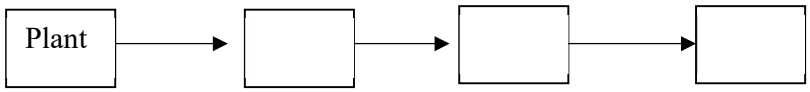
_____

36) Jane found three organisms, A, B and C in the school garden. She placed them in different containers, W, X, Y and Z, in the combination shown below. She provided enough of water and fresh leaves for the organisms in Containers X, Y and Z to last one week, but did not place any water or fresh leaves in Container W.

No organisms were added or removed from the containers throughout the experiment. The results of Jane's experiment are tabulated below:

Container	No. of living organisms at the start			No. of living organisms after one week		
	Organism A	Organism B	Organism C	Organism A	Organism B	Organism C
W	0	10	10	0	0	0
X	10	10	0	0	5	0
Y	10	0	10	6	0	0
Z	0	10	10	0	1	10

(a) Fill in the boxes with letters, A, B, C, to show a possible food relationship involving the three organisms (None of the organisms are omnivores). (1m)



(b) Give a reason why the population size of both Organisms B and C in Container W decreased. (2m)

_____

_____

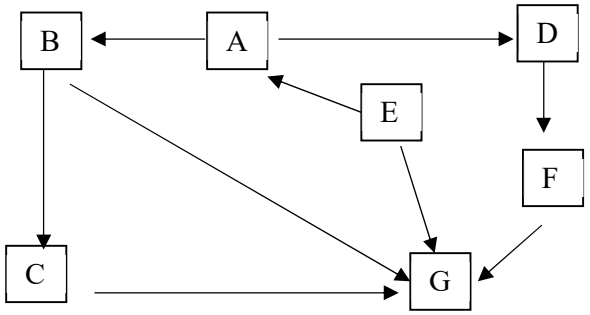
(c) A new population of Organism E was introduced into the community. It interacts directly with Organism A. After a while, the population of the plant decreased. Based on the information, describe what happened that lead to the decrease in the population of the plant. (2m)

_____

_____

_____

37) The food web below shows the food relationships between Organisms A to G.



(a) Which organism is a producer? (1m)

_____

(b) Which organisms are both a prey and a predator in the food web? (2m)

_____

(c) Organism Z is a new animal that is introduced into the food web. It is a predator of D. State the effect on the population size of on the following organisms: (4m)

Organism A:_____

Reason : _____

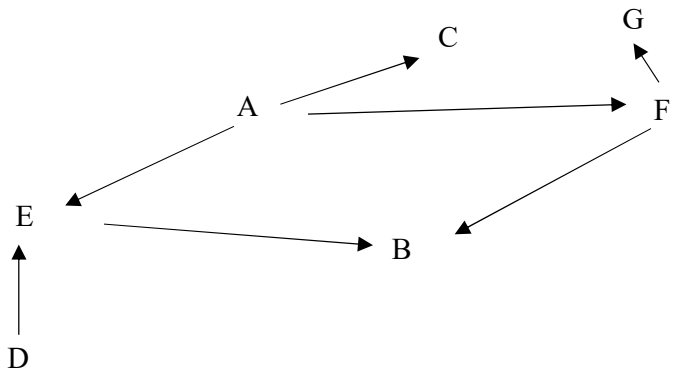
_____

Organism F :_____

Reason : _____

_____

38) Study the food web below.



(a) Based on the food web above, state the relationship between Organism B and E. (1m)

_____

(b) State the number of food chains in the food web above. (1m)

_____

(c) Xiao Hua said that F is both a predator and a prey. Do you agree? Explain your answer. (2m)

_____

_____

_____

(d) The population of Organism B decreased by a large amount when a new organism migrated into the community. Explain how this would affect the population size of Organism D. (2m)

_____

_____

_____

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