



De La Salle School



St Anthony's Primary



St Joseph's Institution Junior



St Stephen's School

**CHRISTIAN BROTHERS' SCHOOLS  
PRELIMINARY EXAMINATION  
2016  
PRIMARY 6 STANDARD SCIENCE  
BOOKLET A**

NAME: \_\_\_\_\_ (                      )

CLASS: PR 6 (                      )

**30 Questions  
60 Marks**

<b>Parent's / Guardian's Signature</b>

**This booklet consists of 24 printed pages**

**Instructions to candidates**

- Follow carefully the instructions given at the beginning of each section.
- For Questions 1 to 30, shade the answers in the Optical Answer Sheet provided.
- You are allowed 1 h 45 min to answer all the questions in both **Booklets A and B**.

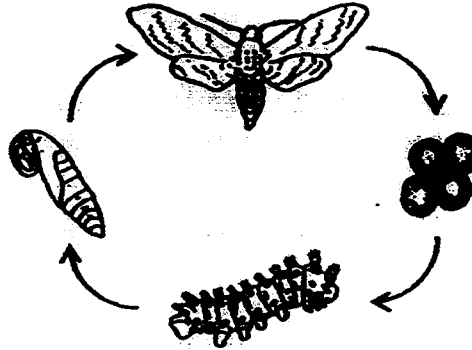
BOOKLET	MARKS	
	POSSIBLE	ACTUAL
A	60	
B	40	
TOTAL	100	

**DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.**

**Section A [60 marks]**

For each of the question numbered 1 to 30, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4) and shade the correct oval on the Optical Answer Sheet.

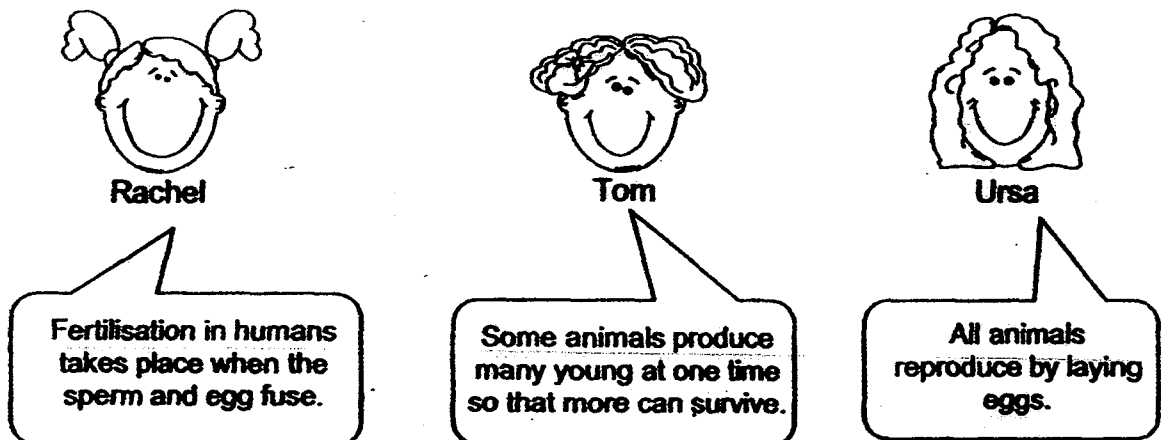
- 1 The diagram below shows the life cycle of a moth.



Which one of the following animals has a similar life cycle as the moth?

- (1) cockroach
- (2) frog
- (3) grasshopper
- (4) mosquito

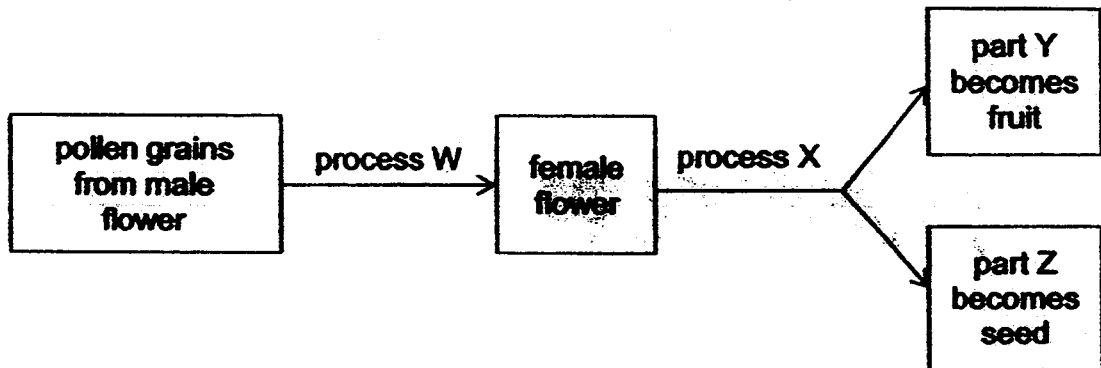
- 2 In the diagram below, each child said something about the reproduction of humans and animals.



Who made correct statement(s)?

- (1) Rachel only
- (2) Tom only
- (3) Rachel and Tom
- (4) Rachel and Ursa

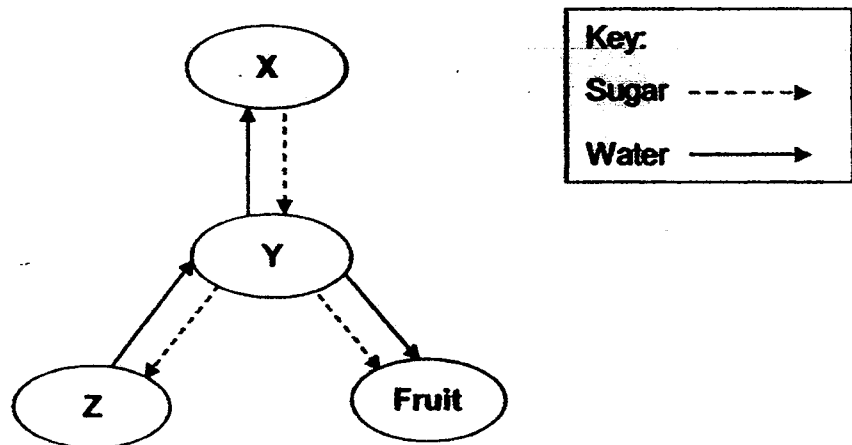
- 3 The flowchart below shows the reproduction of a flowering plant.



Which one of the following correctly represents W, X, Y and Z?

	process W	process X	part Y	part Z
(1)	pollination	fertilisation	ovary	ovule
(2)	pollination	fertilisation	ovule	ovary
(3)	fertilisation	pollination	ovary	ovule
(4)	fertilisation	pollination	ovule	ovary

- 4 The diagram below shows how food and water are transported within a plant. X, Y and Z represent different parts of the plant.



Which one of the following correctly identifies the plant parts represented by X, Y and Z?

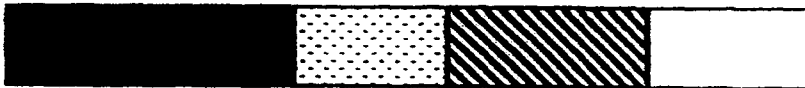
	X	Y	Z
(1)	stem	leaves	roots
(2)	stem	roots	leaves
(3)	leaves	roots	stem
(4)	leaves	stem	roots

- 5 Alice was trapped in a lift that did not allow fresh air from outside to enter. The diagram below shows the composition of four different gases in the lift when she first entered the lift.



Which of the following diagrams shows the correct composition of the gases in the lift after one hour?

(1)



(2)



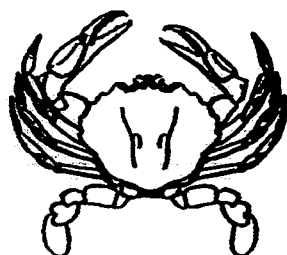
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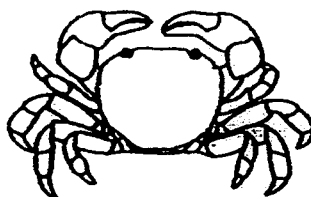
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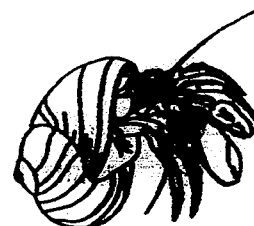
6 The diagram below shows three different crabs, J, K and L.



crab J

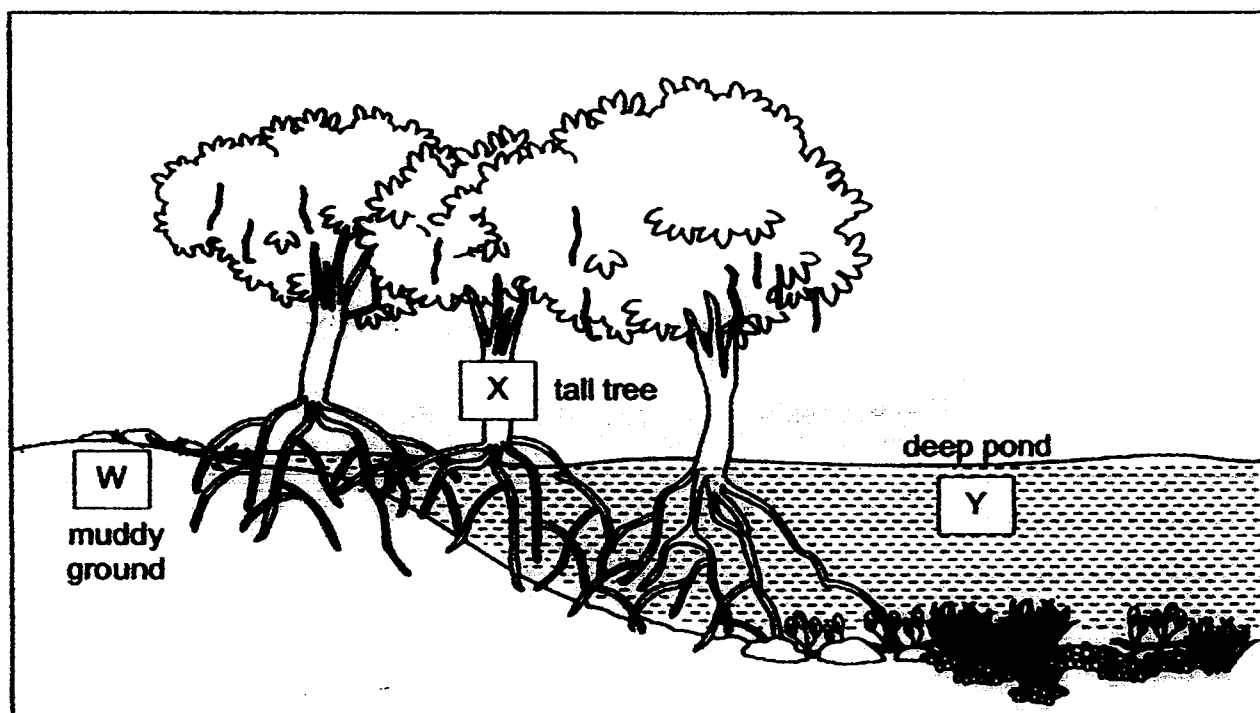


crab K



crab L

They can usually be seen in different parts W, X and Y of the habitat below.



Which of the crabs J, K and L are most likely to be found at W, X and Y?

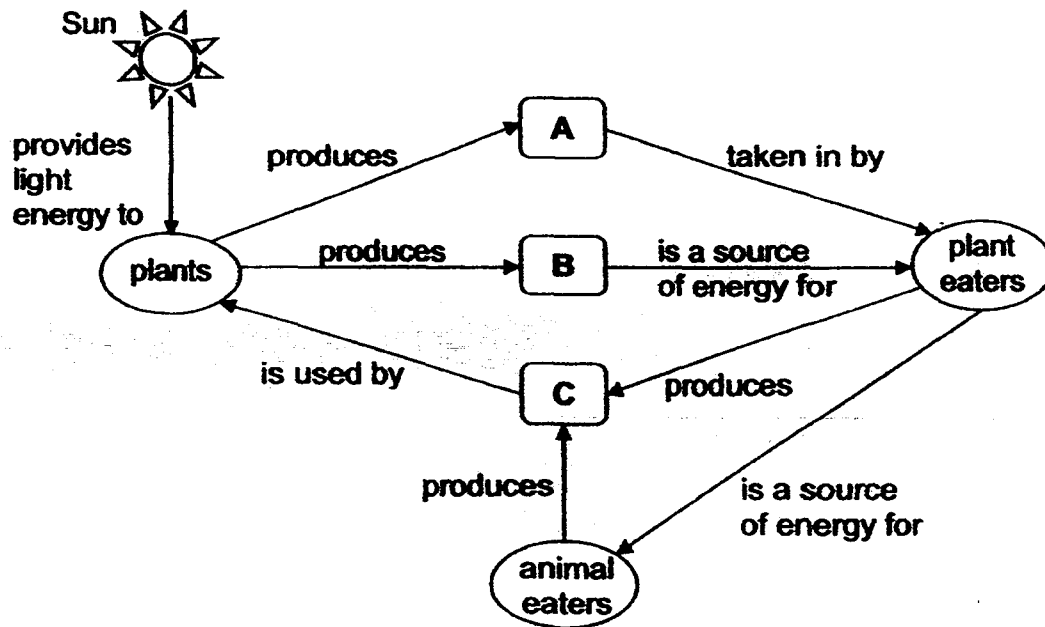
	crab J	crab K	crab L
(1)	X	W	Y
(2)	Y	X	W
(3)	W	Y	X
(4)	W	X	Y

- 7 Reforestation is the replanting of trees of a forest which have previously been damaged or destroyed.

Which one of the following is not likely a result of reforestation?

- (1) less soil erosion
- (2) less rainfall in the area
- (3) more variety of animals
- (4) less carbon dioxide in the air

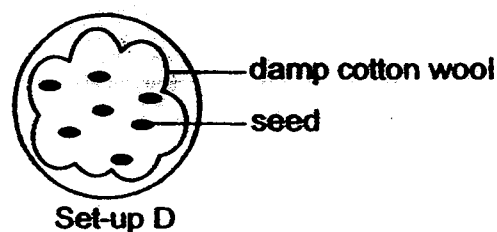
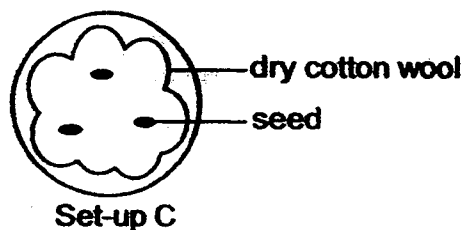
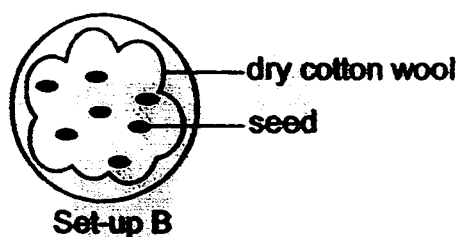
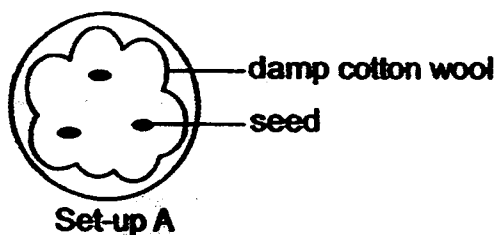
- 8 Study the concept map shown below.



What do A, B and C represent?

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

- 9 Lynn wants to carry out an experiment to find out whether seeds need water to germinate.



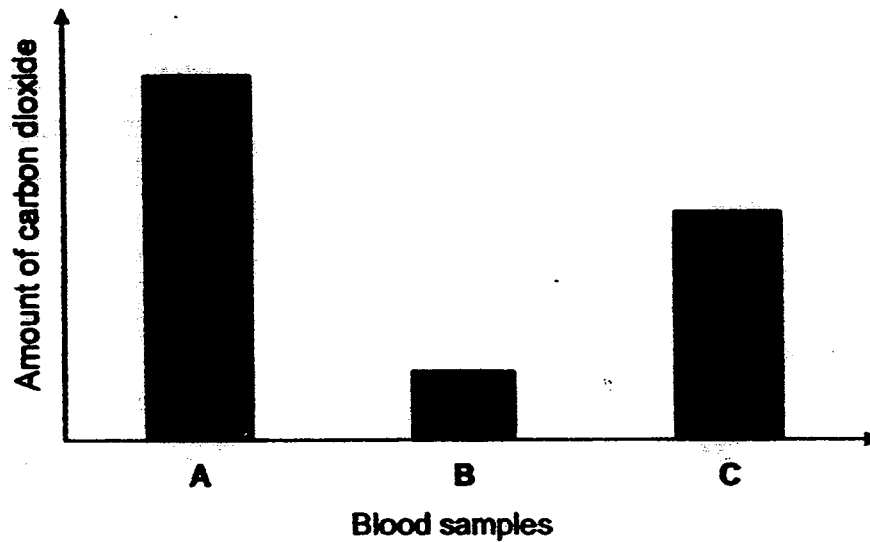
Of the 4 set-ups, A, B, C and D shown above, which two should she use to ensure a fair test?

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

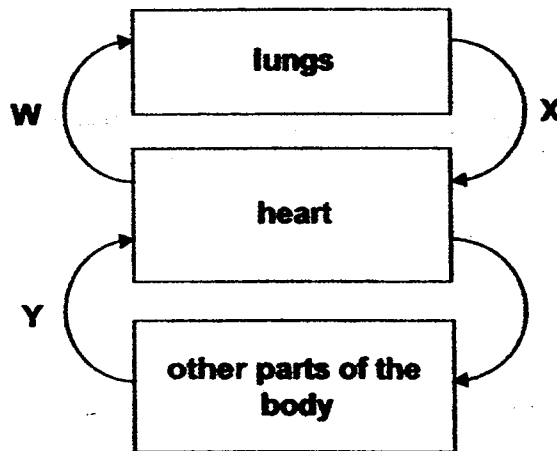
- 10 Which of the following is a similarity between pollination and seed dispersal?

- (1) Both do not involve wind.
- (2) Both take place before fertilization.
- (3) Both are carried out by all green plants.
- (4) Both can benefit animals which are involved.

- 11 The bar graph below shows the amount of carbon dioxide in three blood samples, A, B and C. These blood samples are taken at the same time from different blood vessels located in the different parts of the human circulatory system.



The diagram below represents how blood travels in the human body. Arrows W, X and Y represent blood vessels.

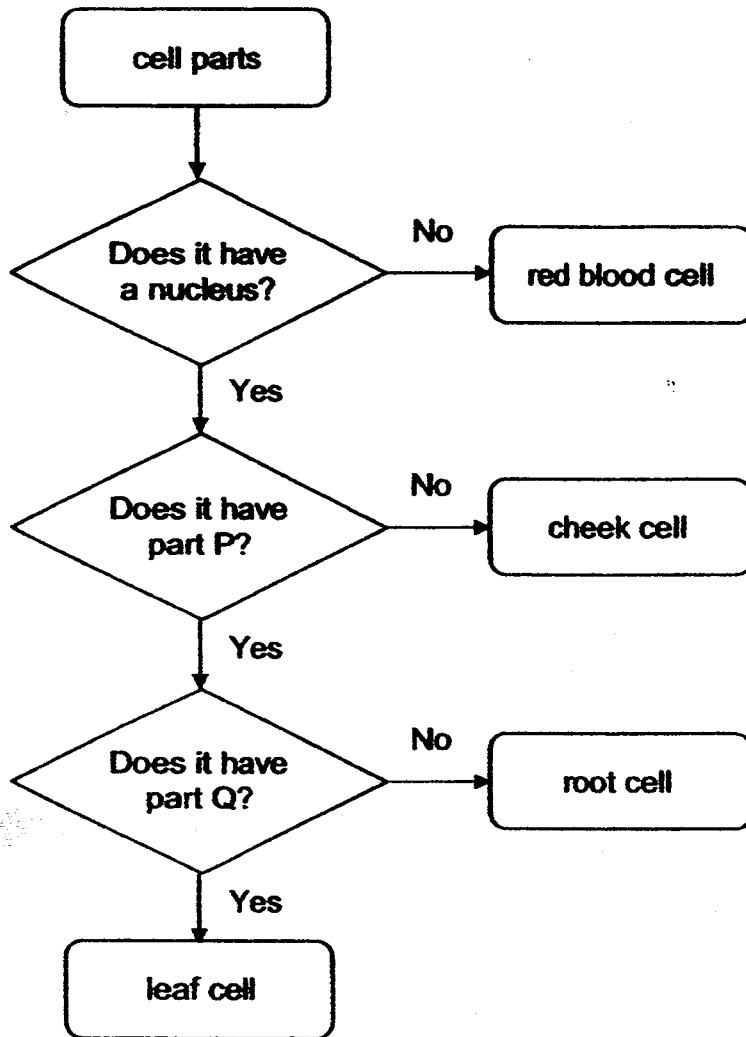


Which one of the following correctly matches blood samples A, B and C to the correct blood vessels?

	blood sample A	blood sample B	blood sample C
(1)	W	Y	X
(2)	Y	W	X
(3)	W	X	Y
(4)	X	W	Y



12 Study the flow chart below.



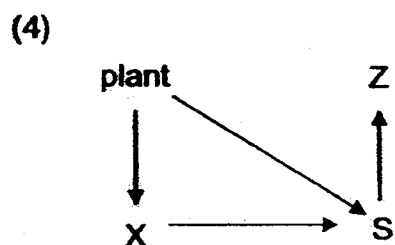
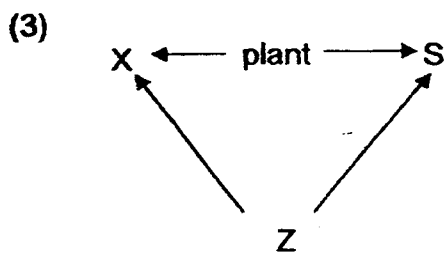
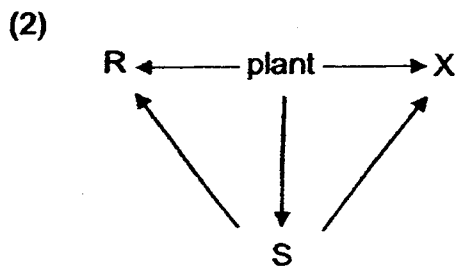
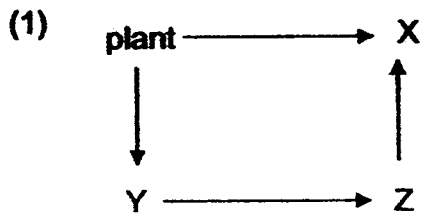
Which one of the following correctly identifies parts P and Q?

	part P	part Q
(1)	chloroplast	cytoplasm
(2)	chloroplast	cell wall
(3)	cell membrane	chloroplast
(4)	cell wall	chloroplast

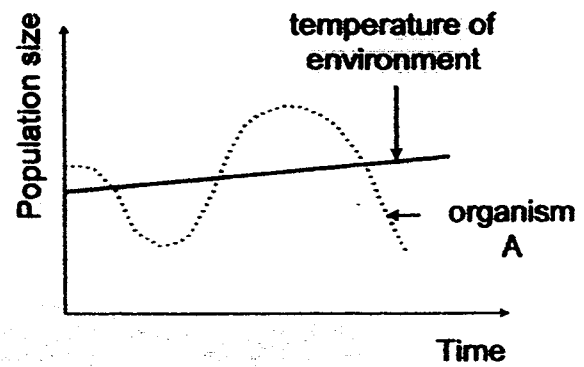
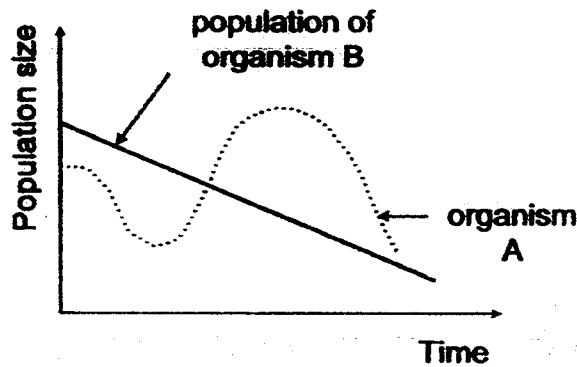
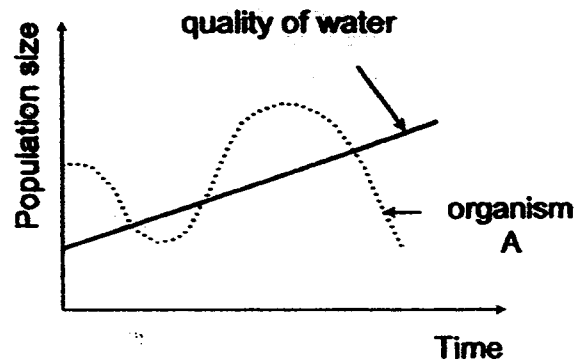
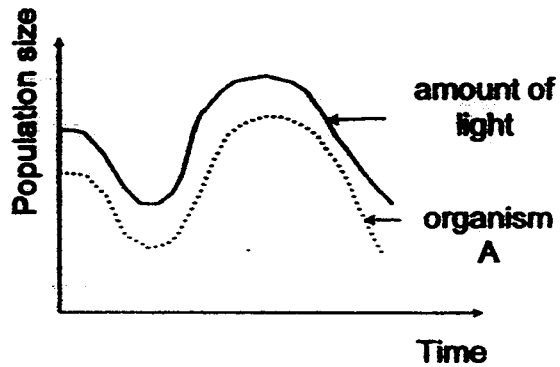
- 13 The table below shows some organisms and the type of food they eat.

plant eater	animal eater	plant and animal eater
X and Y	Z	R and S

Which one of the following food webs shows a possible relationship between some of the organisms in the table above?



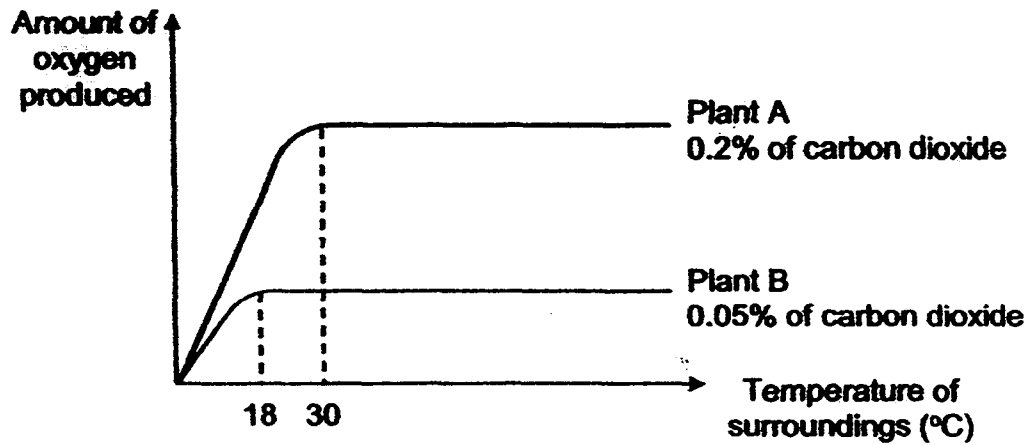
- 14 The four graphs below show how the population of an aquatic organism, A, changes over a period of 5 years, under the influence of four different factors: temperature of environment, quality of water, amount of light and population of another organism, B.



The population of organism A is directly affected by \_\_\_\_\_.

- (1) amount of light
- (2) quality of water
- (3) population of organism B
- (4) temperature of environment

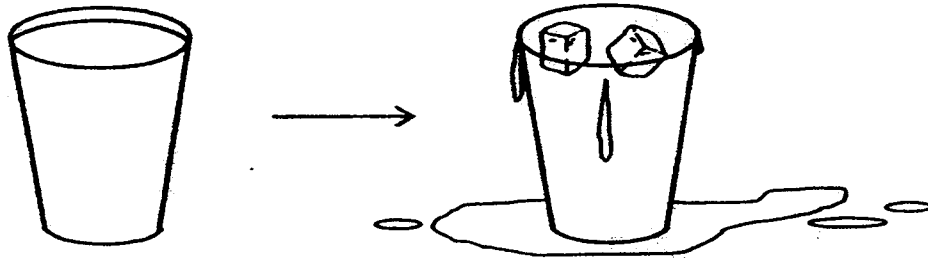
- 15 Hamid conducted an experiment to find out factors affecting the rate of photosynthesis on two similar plants. He then sketched the graph below to show the results of his experiment.



From the graph, Hamid can conclude that the rate of photosynthesis is affected by the \_\_\_\_\_.

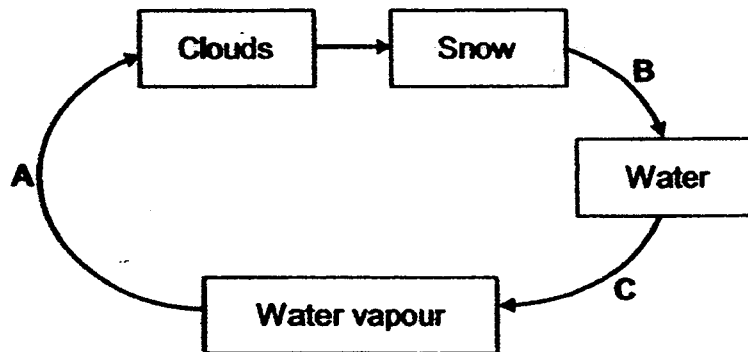
- A temperature of the surroundings
  - B amount of carbon dioxide present
  - C amount of oxygen present
- (1) A only
- (2) B only
- (3) A and B only
- (4) B and C only

- 16 Gabriel filled a glass with water to the brim. When he put two ice cubes into the glass of water as shown in the diagram below, he observed that the water overflowed.



Which one of the following best explains Gabriel's observation?

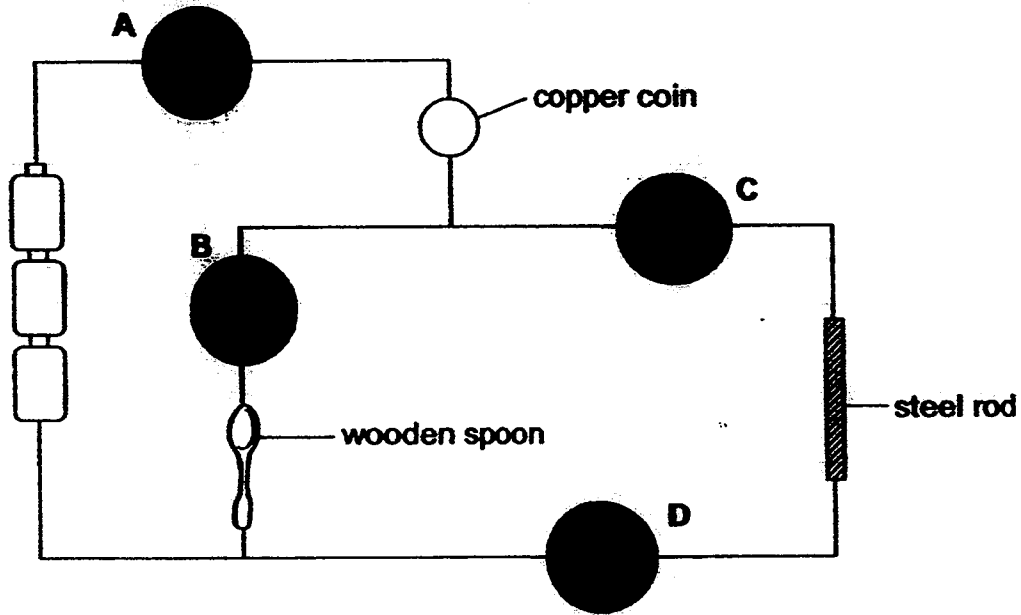
- (1) Ice occupies space.
  - (2) Ice has a definite shape.
  - (3) Water exists in three states.
  - (4) Water changes from one state to another.
- 17 Study the water cycle below. A, B and C are processes that cause a change of state in water.



Which one of the following correctly shows if heat was gained or lost during processes A, B and C?

	A	B	C
(1)	heat gain	heat loss	heat gain
(2)	heat gain	heat loss	heat loss
(3)	heat loss	heat gain	heat loss
(4)	heat loss	heat gain	heat gain

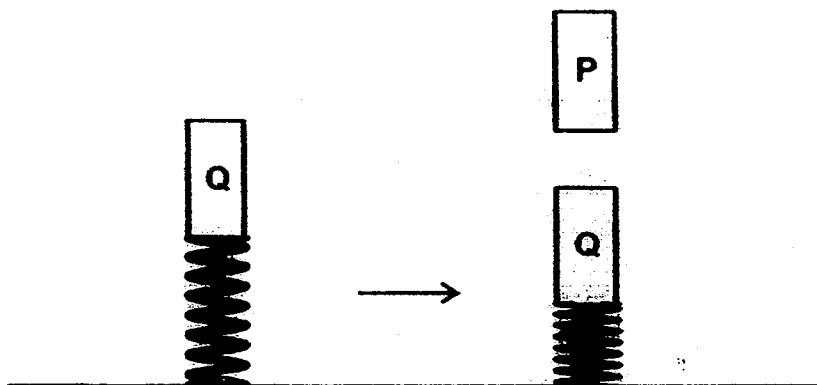
- 18 There are four bells, A, B, C and D, shown in the electrical circuit below. All the components are in good working condition.



Which of the bells will ring?

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

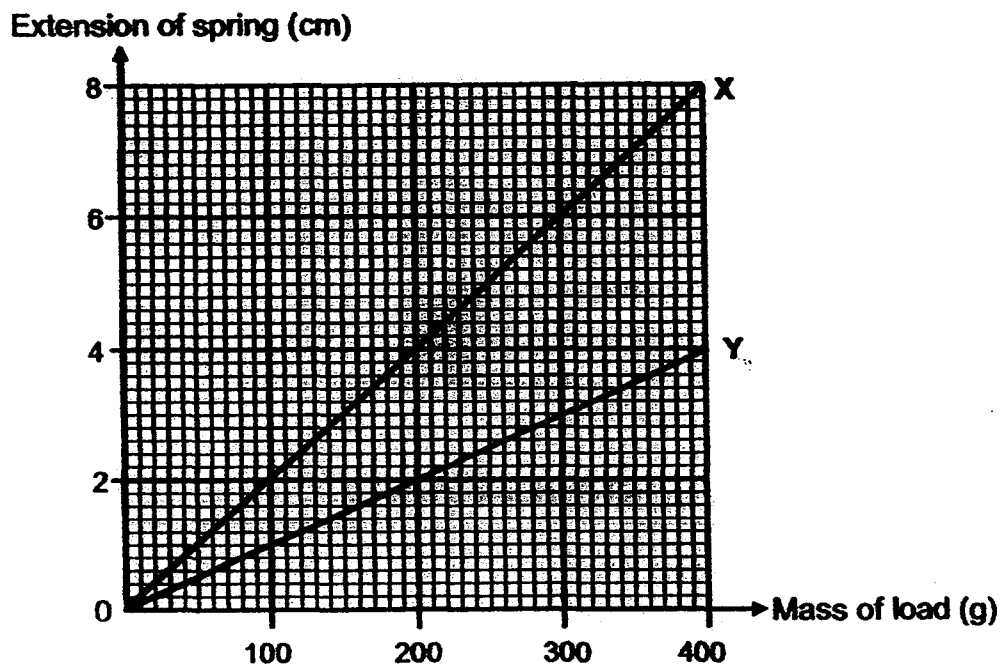
- 19 Mary placed a magnet P near another magnet Q which was attached to a spring as shown below. Magnet Q moved down and the spring became shorter.



Which force(s) acted on magnet Q when it moved?

- A elastic spring force
  - B gravitational force
  - C magnetic force
- (1) C only
  - (2) A and B only
  - (3) B and C only
  - (4) A, B, and C

- 20 The original length of spring X and spring Y was 5cm. After loads of various mass were hung on them, Simon recorded the extension of each spring and plotted the graph below.

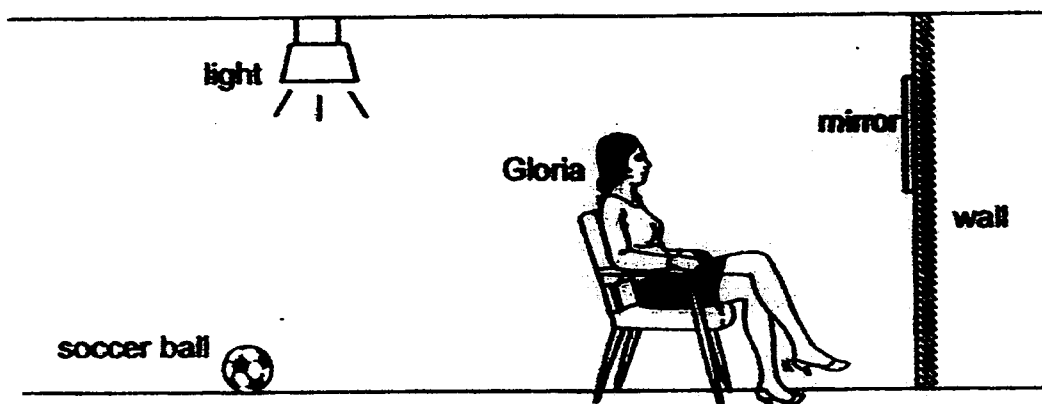


Which one of the following correctly shows the length of springs X and Y when a load of 200g was hung on it?

	spring X	spring Y
(1)	9 cm	7 cm
(2)	4 cm	2 cm
(3)	7 cm	9 cm
(4)	2 cm	4 cm



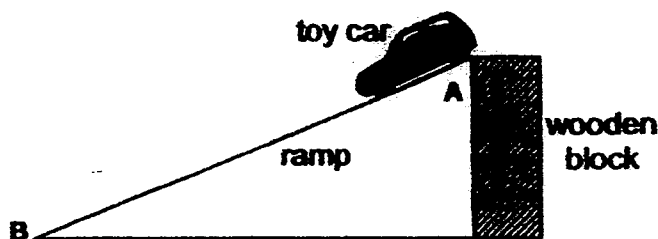
- 21 When Gloria was sitting down facing a mirror on a wall, she could not see the soccer ball behind her.



Which one of the following was the reason why Gloria could not see the ball?

- (1) The ball did not reflect light.
- (2) The mirror did not reflect light.
- (3) The ball did not allow light to pass through.
- (4) Gloria's body did not allow light to pass through.

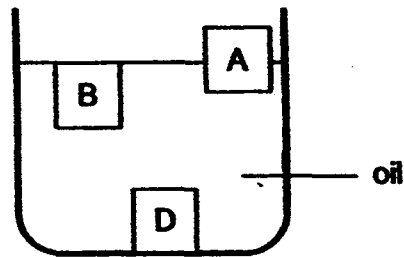
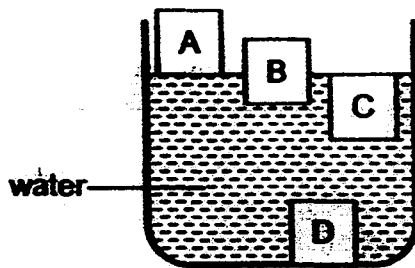
- 22 John releases a toy car down the ramp from Point A to Point B as shown below.



Which one of the following correctly shows how the car's gravitational potential energy and kinetic changes from Point A to Point B?

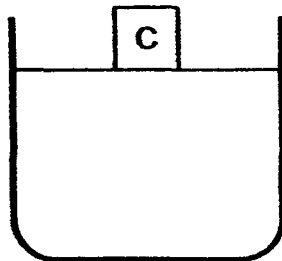
	gravitational potential energy	kinetic energy
(1)	decreases	decreases
(2)	decreases	increases
(3)	remains the same	increases
(4)	remains the same	decreases

- 23 The diagram below shows two containers with four different blocks made of different materials, A, B, C and D.

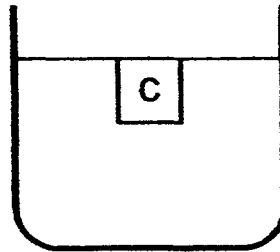


Which one of the following shows the most likely position of block C when it is placed in the container of oil?

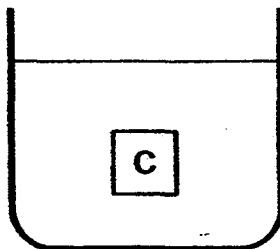
(1)



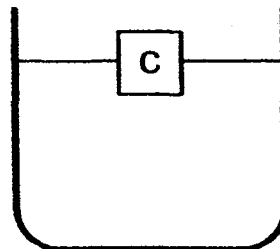
(2)



(3)



(4)



- 24 The table below shows the freezing and boiling points of three unknown substances W, X and Z.

substance	freezing point (°C)	boiling point (°C)
W	39	85
X	46	117
Z	65	90

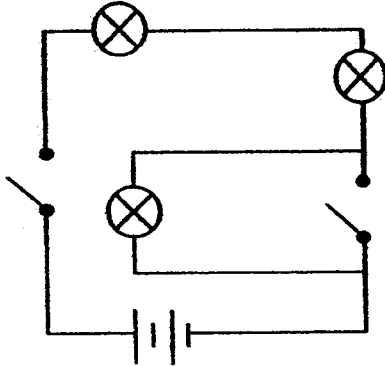
At which temperature would all three substances be in the liquid state?

- (1) 20°C
- (2) 70°C
- (3) 120°C
- (4) 135°C

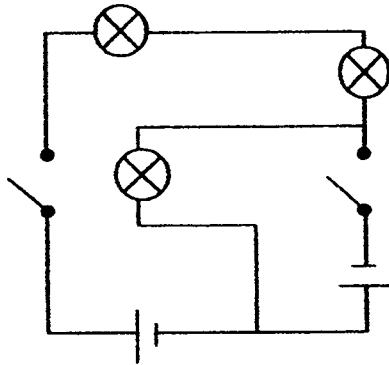
- 25 Ravi constructed a circuit by connecting 2 identical batteries, 3 identical bulbs and 2 switches. All the components are in good working condition. He closed only one switch and found that all 3 bulbs lit up.

Which one of the following is not a possible circuit constructed by Ravi?

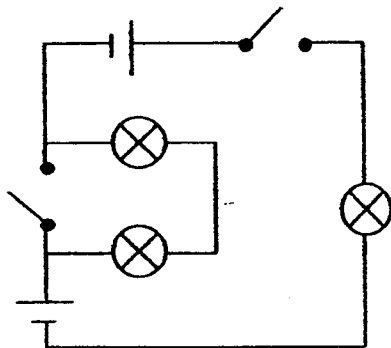
(1)



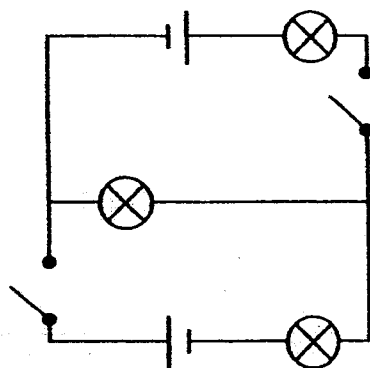
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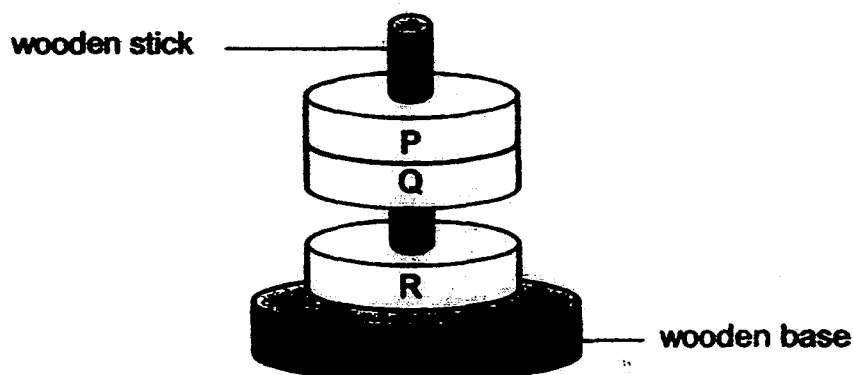
(3)



(4)



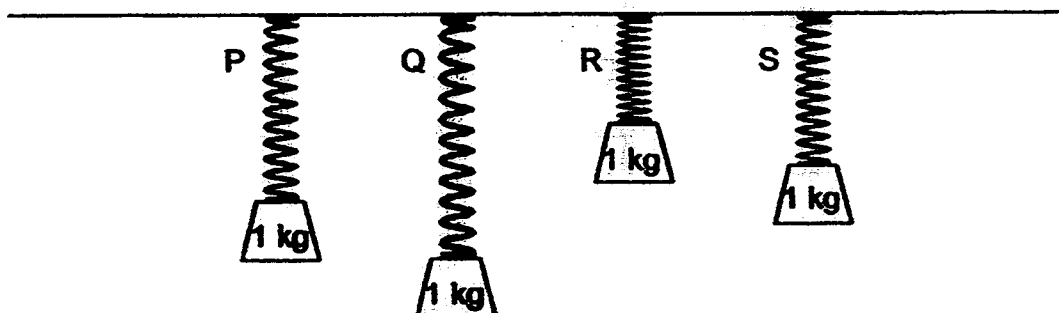
- 26 Three similar sized rings made of unknown materials are slotted through a wooden stick that is joined to a wooden base as shown below.



Based on the diagram above, which of the following conclusions are possible?

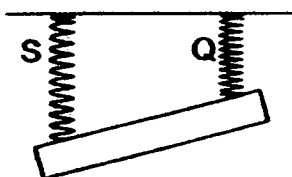
- A P, Q and R are magnets.
  - B P and R are magnets while Q is a magnetic object.
  - C Q and R are magnets while P is a non-magnetic object.
  - D Q is a magnet, R is magnetic and P is a non-magnetic object.
- (1) A and C only
- (2) B and C only
- (3) A, B and D only
- (4) A, C and D only

- 27 Ashton carried out an experiment using four springs, P, Q, R and S, which had the same length when unstretched. He hung four similar weights on each of the springs and observed the results below.

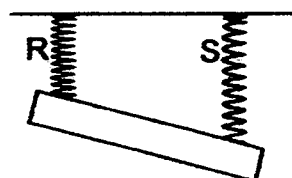


Based on Ashton's results, which one of the following is possible when an iron rod is hung on the springs?

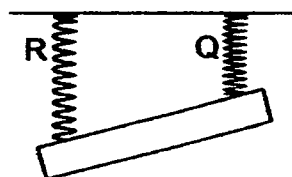
(1)



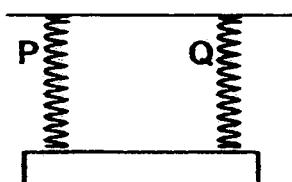
(2)



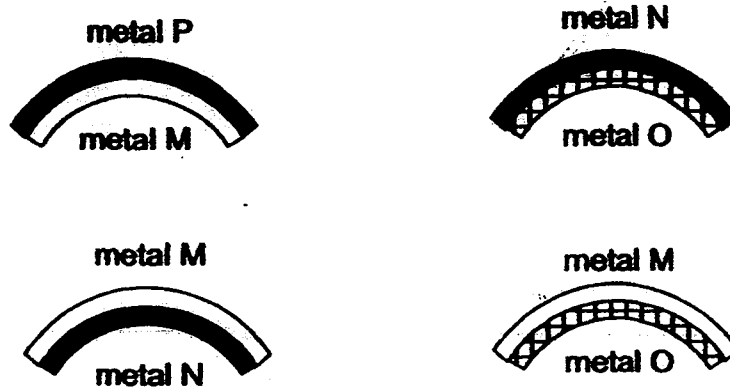
(3)



(4)



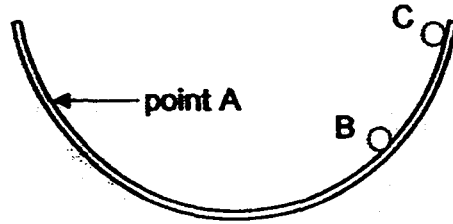
- 28 A bimetallic strip is a strip consisting of two different metals joined together. When heated, the bimetallic strip will heat up and bend because different metals expand at different rates.  
The diagram below shows how 4 different bimetallic strips bend when they are heated.



Which of the following correctly shows how metals M, N, O and P are arranged in the correct order?

	Expands the least <span style="float: right;">→ Expands the most</span>			
(1)	M	N	O	P
(2)	P	M	N	O
(3)	O	N	M	P
(4)	P	M	O	N

- 29 Wen Kang released a metal ball from point A in a bowl. He observed that the metal ball could only reach point B.

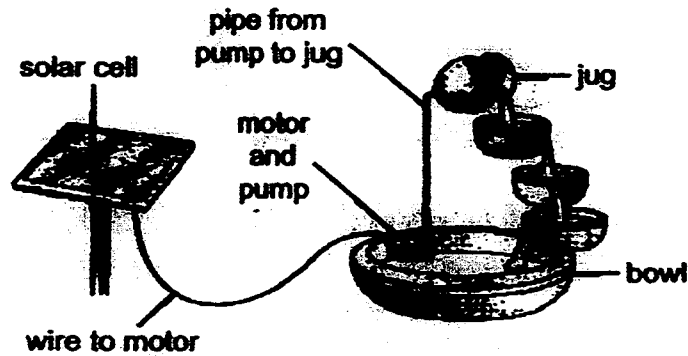


Which of the following would definitely not enable the ball to reach position C?

- A push the ball when it is released
  - B apply oil on the inner surface of the bowl
  - C put the bowl at a higher location before releasing the ball
- (1) A only
- (2) B only
- (3) C only
- (4) B and C only



- 30 The diagram below shows a solar-powered water fountain. The motor pumps water up to the jug and the water then flows down back to the bowl.



Which one of the following correctly shows the energy changes in the different parts of the fountain?

	in the solar cell	in the motor	in the water in the pipe
(1)	light → kinetic	electrical → kinetic	kinetic → potential
(2)	light → kinetic	electrical → potential	potential → kinetic
(3)	light → electrical	electrical → kinetic	kinetic → potential
(4)	light → electrical	electrical → potential	potential → kinetic

**END OF SECTION A**



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**CHRISTIAN BROTHERS' SCHOOLS  
PRELIMINARY EXAMINATION  
2016  
PRIMARY 6 STANDARD SCIENCE  
BOOKLET B**

NAME: \_\_\_\_\_ (                      )

CLASS: PR 6 (                      )

**14 Questions  
40 Marks**

<b>Parent's / Guardian's Signature</b>

**This booklet consists of 19 printed pages**

**Instructions to candidates**

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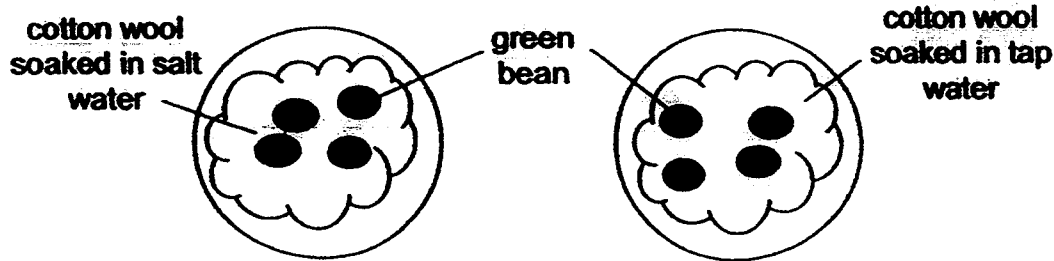
BOOKLET	MARKS	
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A	60	
B	40	
TOTAL	100	

**DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.**

**Section B [40 marks]**

Write your answers to Questions 31 to 44 in the spaces provided.

- 31 Muthu thought that green beans would germinate better in salt water than in tap water. He set up the experiment below to investigate.



He placed the two set-ups at the same location and gave the seeds the same amount of salt water or tap water daily.

- (a) What observation would show that green beans germinate better in salt water than in tap water? [1]

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- (b) Besides water, what do seeds need to germinate? [1]

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- (c) How would using the same amount of water ensure that a fair test had been conducted? [1]

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- 32 Chloe conducted an experiment using 4 similar fruits from a plant that disperses its seeds by splitting. She subjected the 4 fruits to different temperatures and measured the time taken for the fruit to split. The results are as follows:

	Fruit A	Fruit B	Fruit C	Fruit D
Temperature (°C)	5	20	35	30
Time taken for the fruit to split (hours)	Did not split	12	2	3

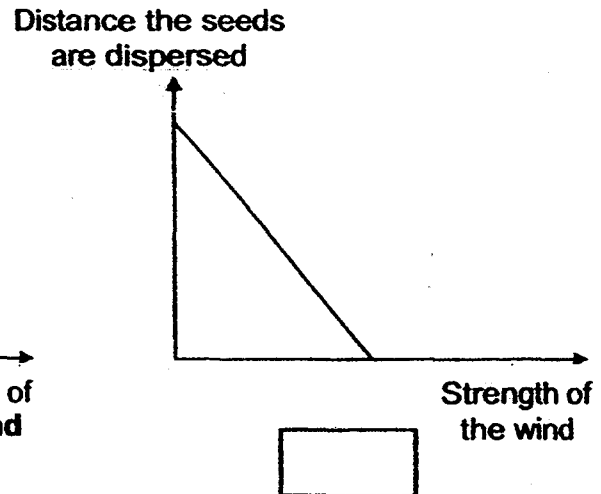
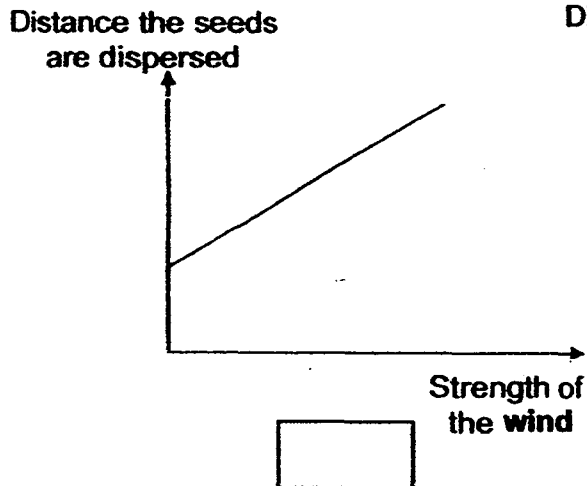
- (a) What is relationship between the surrounding temperature and the time taken for the fruit to split? [1]

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- (b) After splitting, the seeds from the fruits mentioned above are dispersed by wind. Which of the following graphs correctly shows the relationship between the strength of the wind and the distance the seeds are dispersed? Choose your answer and tick (✓) in the box. [1]



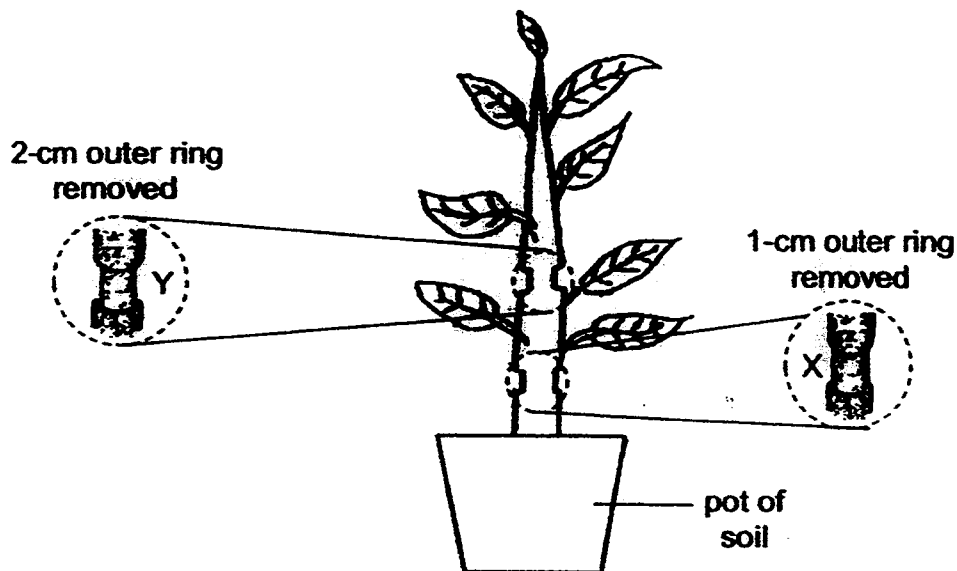
- (c) Explain your answer in (b). [1]

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- 33 Peifen removed a 1-cm thick outer ring from a plant at X. She also removed another ring which is 2-cm thick from the same plant at Y. She then placed the pot of plant in the garden and watered the plant daily.



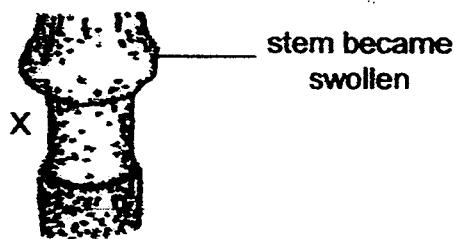
- (a) After a few days, the leaves above Y turned yellow but not the leaves between X and Y. Explain why the leaves turned yellow. [1]

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- (b) After a week, Peifen observed that the stem above X swelled as shown below.



Give a reason for her observation.

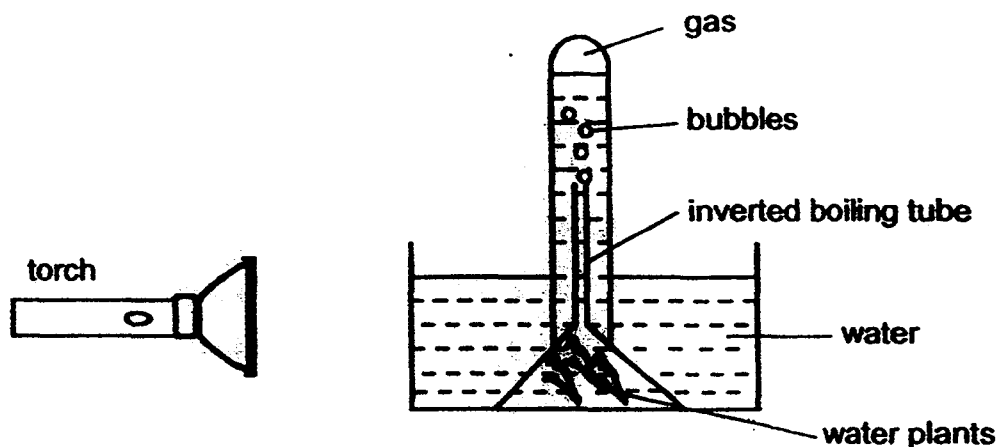
[1]

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- 34 Chong Boon set up the following experiment to investigate how the colour of light affects the rate of photosynthesis of water plants.



He counted the number of bubbles given out during a fixed period of time for each colour of light. He then changed the colour of the light and repeated the experiment. The results for his experiment are recorded in the table below.

Colour of light	Number of bubbles
red	28
blue	25
green	0
yellow	17

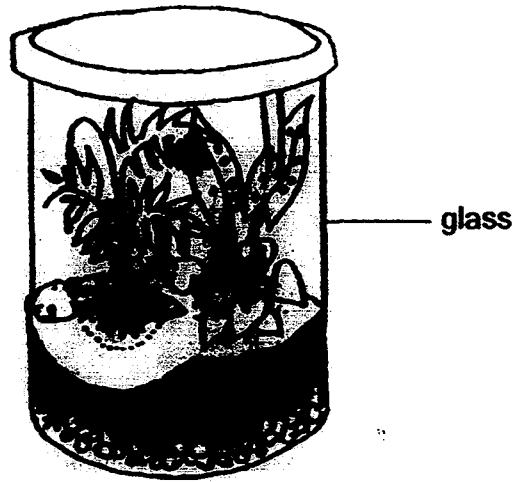
- (a) Using only the setup above, apart from counting the number of air bubbles produced, what else could Chong Boon measure to determine how fast the plant is carrying out photosynthesis? [1]

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Chong Boon wanted to make a terrarium as shown below.

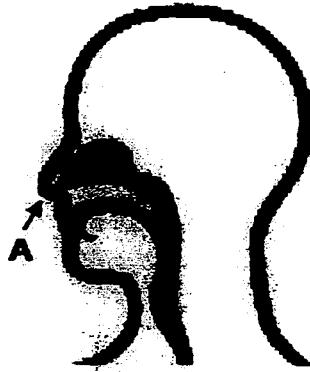


- (b) Based on the result of his experiment, what should the colour of the glass be in order for the plants to grow well? Explain your answer. [1]

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- 35 The diagram below shows air entering the human respiratory system through the nose.



- (a) Give a reason why the air at B contains less dust particles than A. [1]

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- (b) Explain why the air we breathe out is warmer than the air we breathe in. [1]

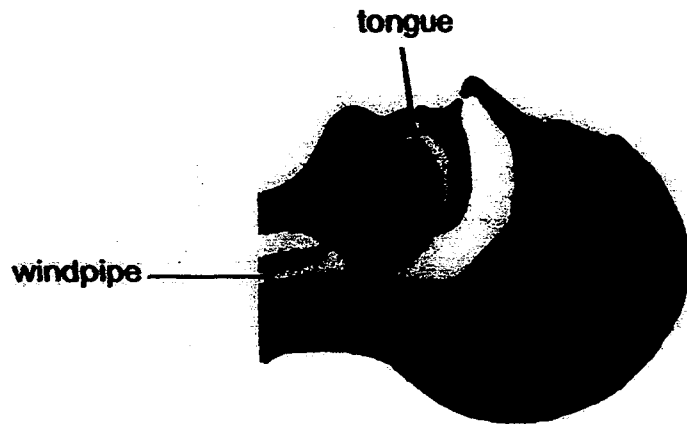
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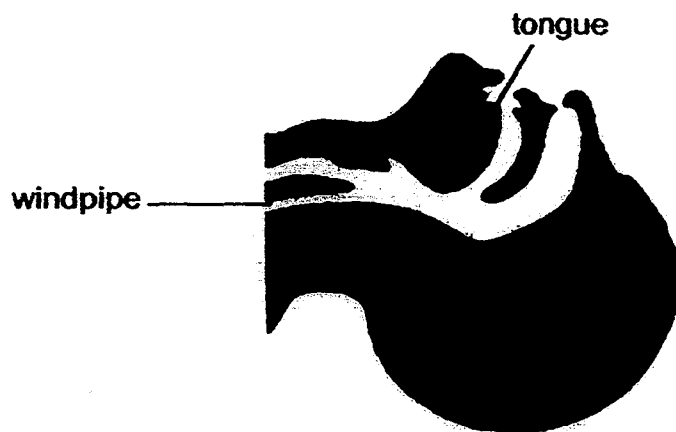


Mouth-to-mouth resuscitation is a technique to help a person who has stopped breathing. To do this, the rescuer puts his mouth over the person's open mouth and blows into it, forcing air into the lungs.

The picture below shows the position of the tongue before and after the head was tilted backwards.



head not tilted backwards



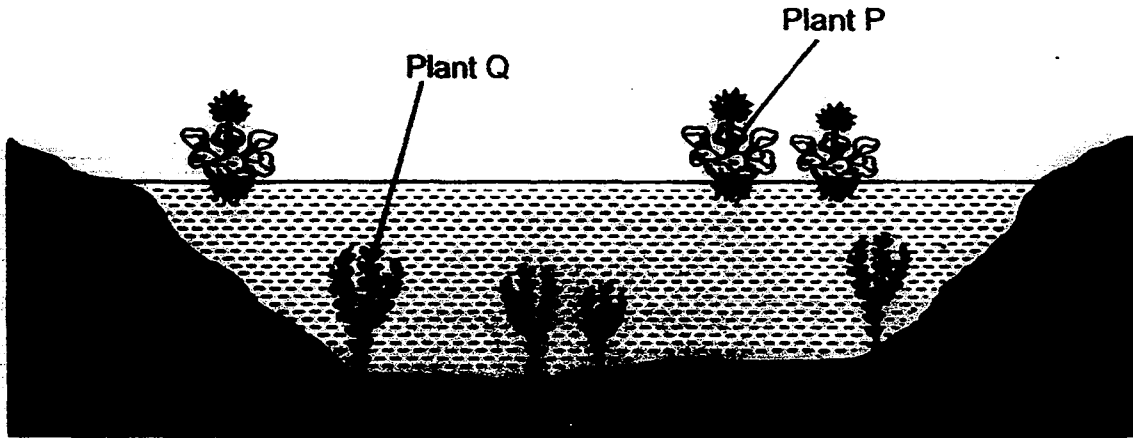
head tilted backwards

- (c) Based on the picture, give a reason why it is important to tilt the head backwards before carrying out mouth-to-mouth resuscitation. [1]

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- 36 The diagram below shows a pond with two types of aquatic plants, P and Q.



- (a) Explain how an increase in the population of plant P would affect the survival of plant Q. [2]

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- (b) When a lot of plant Q died, the level of carbon dioxide in the pond water increased. Give a reason why the dead plants caused an increase in the level of carbon dioxide in the pond water. [1]

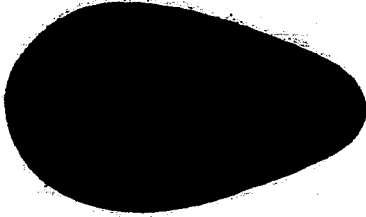
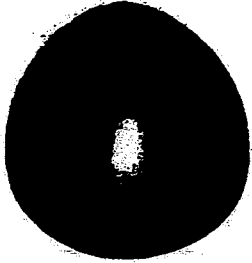
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- 37 Bird G is a seabird that lives on the bare ledges of steep and rocky cliffs. The only way to reach the ledges is by flying there. Bird G does not build nests for its eggs as there are usually insufficient spaces on the ledges to do so.

The picture below shows two different eggs A and B. Egg A belongs to bird G.

	 egg A	 egg B
Appearance	grey colour with irregular black markings	white colour with no pattern
What happens to the egg when it is gently moved	spins at the same spot	rolls away

- (a) Give two reasons why egg A is more suitable than egg B to survive in bird G's natural habitat. [2]

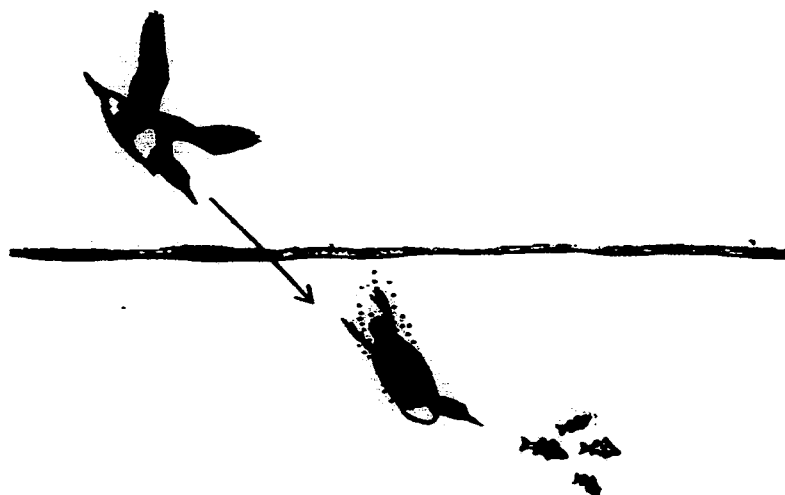
Reason 1: \_\_\_\_\_

\_\_\_\_\_

Reason 2: \_\_\_\_\_

\_\_\_\_\_

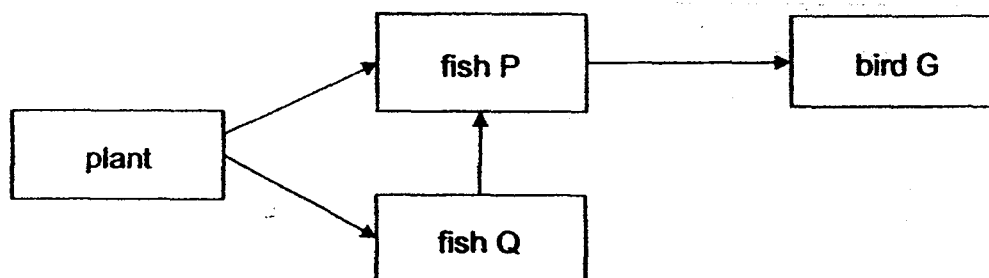
Bird G can dive into the sea water to catch fish and other small marine animals. The picture below shows how bird G dives into the water to hunt for food.



- (b) Besides having webbed feet that helps it to swim, identify another structural adaptation that enables bird G to move quickly in the water. [1]

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The food web below shows the food relationships between bird G and three other organisms.



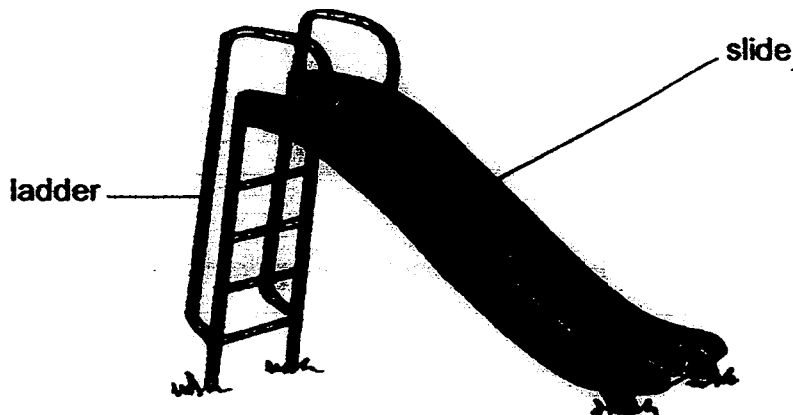
- (c) Explain why an increase in the population size of bird G would cause the population size of fish Q to increase. [1]

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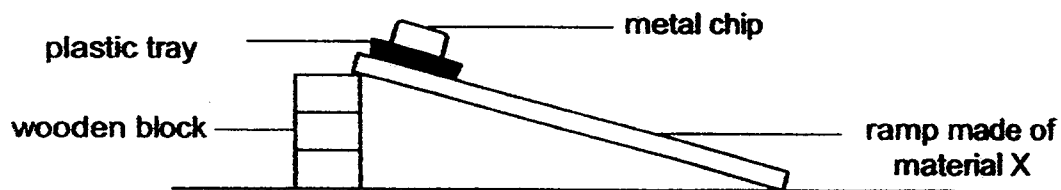
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38

Rachel wanted to design a slide which would enable children to slide down easily.



She selected three materials X, Y and Z of different textures and she conducted an experiment as shown below.



The table below shows the time taken for the metal chip on the plastic tray to slide down and reach the bottom of the ramp.

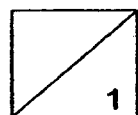
	material X	material Y	material Z
Time taken for tray to reach the bottom of the ramp (s)	2.1	1.3	1.8

- (a) Based on the result of the experiment, which material is most suitable for making the slide? Explain your answer. [1]

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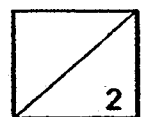
When Rachel removed the metal chip and repeated her experiment, she obtained the result shown below.

	material X	material Y	material Z
Time taken for tray to reach the bottom of the ramp (s)	4.2	2.6	3.2

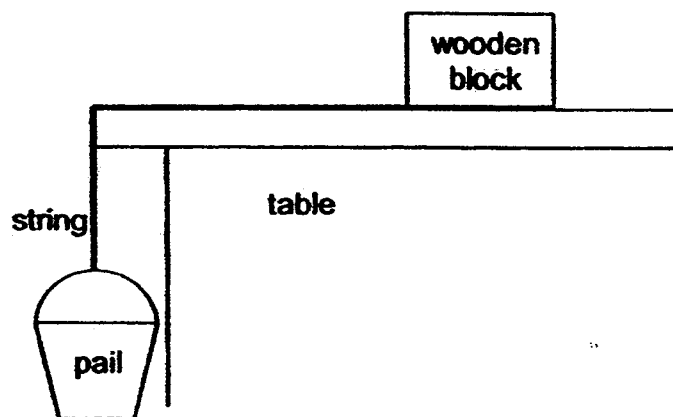
- (b) Explain why the plastic tray took more time to slide down when the metal chip was removed. [2]

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- 39 Betsy tied one end of a string to a wooden block and the other end of the string to a small pail. She placed the wooden block on a table as shown below and dropped 10-cent coins one at a time into the pail. The pail moved downwards when the 25<sup>th</sup> coin was added.



- (a) Identify the force that caused the wooden block to move. [1]

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- (b) If oil was applied on the whole surface of the table before the experiment, would the number of coins required to move the wooden block be equal to, less than or more than 25? Explain your answer. [2]

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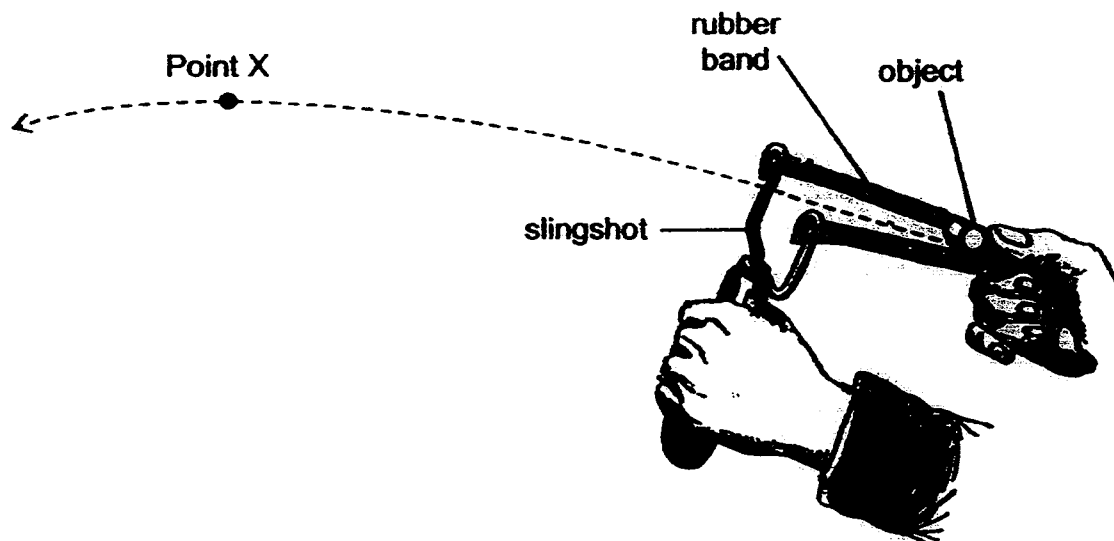


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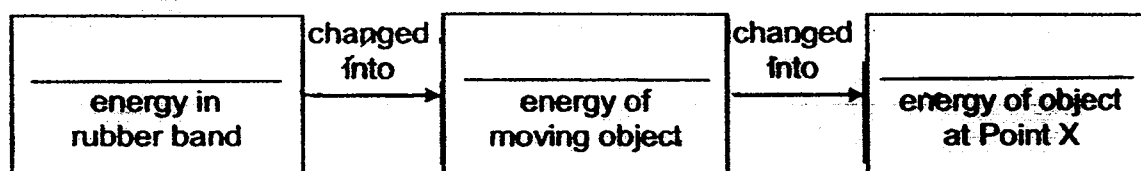


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- 40 The diagram below shows a slingshot which was made of a Y-shaped wooden stick and a rubber band. An object was placed in front of the rubber band and pulled back.



- (a) When the rubber band was released, the object was observed to move upwards until it reaches Point X before it started falling down. Fill in the blanks below to show the main energy conversion. [1]



- (b) Without changing the items used in the experiment or adding any new ones, suggest one way to make the object move a longer distance. Explain your suggestion. [2]

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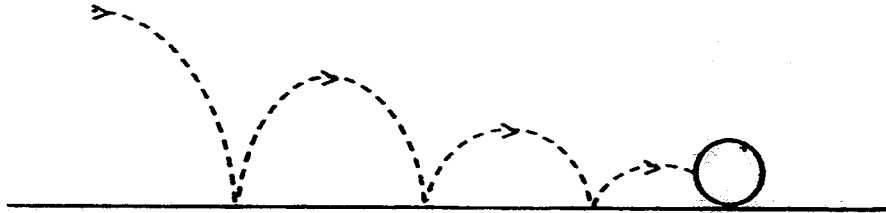
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- (c) When the object landed on the ground, it bounced a few times before it finally stopped. It was observed that the object's rebound height became less after each bounce.

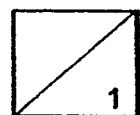


Give a reason for this observation.

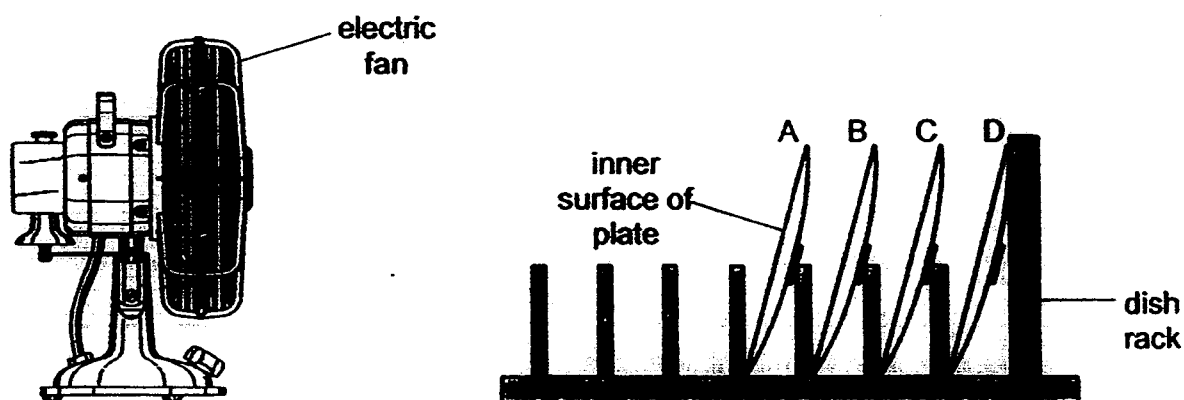
[1]

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- 41 Jason conducted an experiment using four similar sized dish plates, A, B, C and D. He sprayed the inner surface of the plates with an equal amount of amount of water and then stacked them on a dish rack before putting it near an electric fan that was switched on.



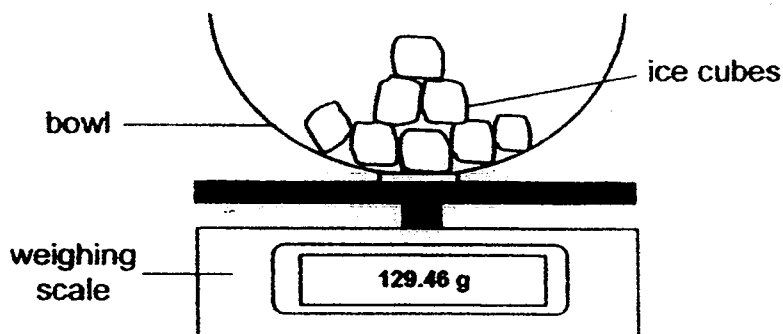
- (a) After some time, Jason noticed that plate A completely dried first. Give a reason for his observation. [1]

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Jason then placed a dried bowl on a weighing scale. He put some ice cubes on the bowl and checked the mass.



After 5 minutes, the weighing scale recorded an increase in mass.

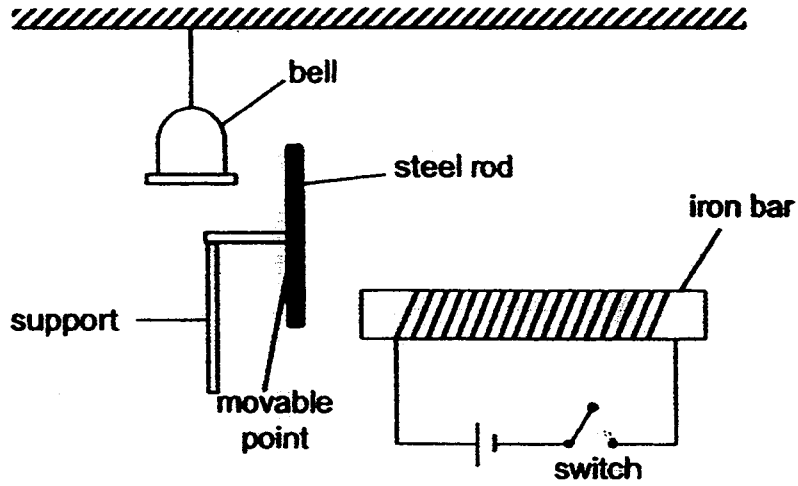
- (b) Give a reason why there was an increase in mass after 5 minutes. [1]

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42 The setup below shows the model of a door bell system.



When the switch was closed, the bell rang once. Explain why.

[2]

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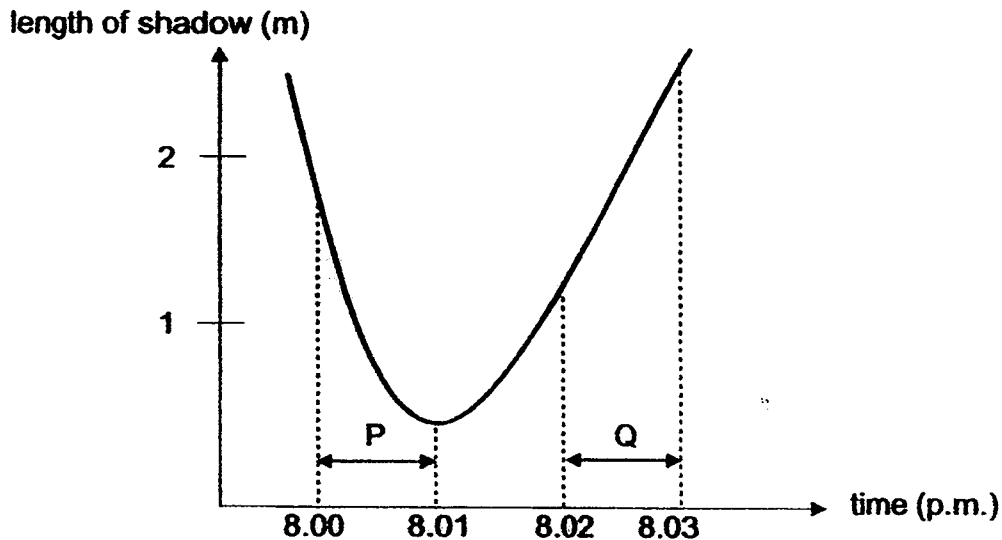


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- 43 The following graph shows the length of Aisha's shadow as she walked on a stretch of a lighted street at night.



- (a) Two properties of light cause shadows to be formed. One of the properties is light can be blocked. State the other property. [1]

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- (b) At what time was Aisha nearest to the street lamp? Explain your answer. [1]

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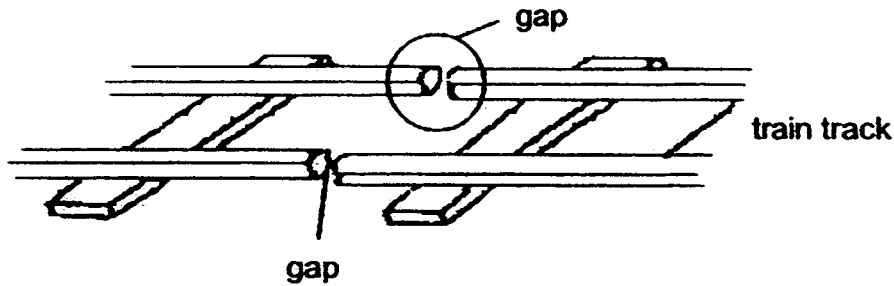
- (c) From the graph above, Joe concluded that Aisha was walking at a faster speed during period P compared to period Q. Explain how Joe came to this conclusion. [1]

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- 44 A train track has gaps at regular intervals as shown below.



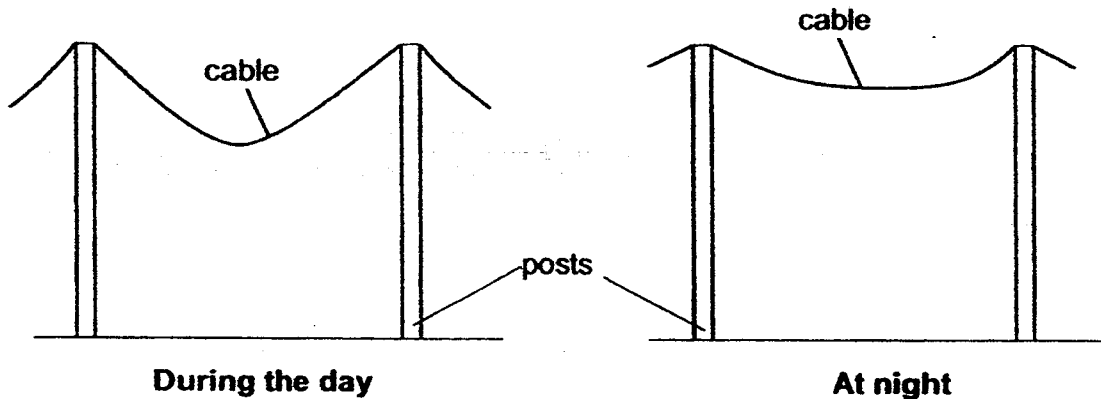
- (a) What would happen to the track on a very hot day if there were no gaps? Give a reason for your answer. [2]

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During the day, a power cable along a road is hanging more loosely between the posts than when it is at night.



- (b) Explain why the power cable hang less loosely between the posts at night. [1]

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----- END OF PAPER -----



Christian Brothers' Schools  
Preliminary Examination 2016 (Standard 6 Science)  
Suggested ANS Key

**Booklet A**

1	4	6	2	11	3	16	1	21	4	26	1
2	3	7	2	12	4	17	4	22	2	27	2
3	1	8	3	13	4	18	2	23	3	28	3
4	4	9	4	14	1	19	4	24	2	29	4
5	2	10	4	15	3	20	1	25	4	30	3

**Booklet B**

- 31 a Green bean soaked in salt water would germinate first.  
b Oxygen and warmth.  
c Using the same amount of water ensures that any difference in the time taken for the green bean to germinate is only due to the type of water used and not the amount of water used.
- 32 a The higher the temperature, the shorter the time taken for the fruit to split.  
b ☒ ☐  
c The stronger the wind, the longer the seeds would stay in the air to be disperse further away from the parent plant.
- 33 a The leaves turned yellow above Y as both the water and food carrying tubes had been removed, hence water cannot be transported from the roots to the leaves about Y for photosynthesis while for the leaves between X and Y, only the outer food carrying tubes were likely removed, hence water can still be transported to the leaves for photosynthesis.  
b As the food-carrying tubes had been removed below X, so the food made by the leaves above X that were transported downwards became accumulated above X.
- 34 a The height of gas collected over a fixed period of time.  
b Red. The plant produced the most bubbles so it means that red light allowed the plant to undergo the greatest rate of photosynthesis.
- 35 a The nose hairs lining the nasal passage would filter and collect the dust particle present in the air entering the nose.  
b The inhaled air is warmed by/gained heat from the body when it entered the body and eventually become exhaled.  
c To prevent the tongue from blocking the windpipe.
- 36 a An increase in the population of P would result in more P blocking light from reaching Q. Hence Q will not be able to make food via photosynthesis.  
b The dead plants would decompose and released carbon dioxide.
- 37 a Reason 1: Egg A's appearance allowed it to camouflage against the rock, making it difficult for predators to spot the egg.  
Reason 2: Egg A will not roll off the ledges easily and break.

- 37 b Streamlined body shape  
c An increase in population of G would result in more P being preyed on by G, hence there will be lesser predators P hunting on fish Q, allowing the population of fish Q to increase.

- 38 a Y. The tray made from Y took the shortest time to reach the bottom of the ramp so there is the least friction between the tray and slide surface/is the smoothest.  
b Without the metal clip, the tray had a smaller mass, so it had less gravitational potential to be converted to kinetic energy.

- 39 a Gravitational force  
b Less than 25. The oil will reduce friction between the wooden block and the table surface.

- 40 a

Elastic potential energy in rubber band	Changed to	Kinetic energy of moving object	Changed into	Gravitational energy of object at Point X

- b Pull the rubber band further back. This allows more elastic potential energy to be converted to more kinetic energy to allow the object to move a longer distance.  
c The kinetic energy of the object had been converted to heat and sound energy.
- 41 a A. Plate A had a larger exposed surface area to wind, so the water on the plate evaporated faster.  
b Warmer water vapour in the air lost heat to and condensed on the cooler outer surface to form water droplets.
- 42 When the switch is closed, the iron bar became an electromagnet and attracted the movable point of the steel rod towards it, causing the top end of the steel rod to hit the bell.
- 43 a Light travels in a straight line.  
b 8.01pm. Her shadow was the shortest at 8.01pm. The nearer she is to the light source, the shorter the shadow formed.  
c The length of her shadow changed more over the one minute time period P than Q.
- 44 a The track would buckle and crack as there will be no room for the track to expand on hot days.  
b At night, the cable would lose heat to the cooler surroundings and contract, hence resulting in the cable to become shorter and hang less loosely.