



PRELIMINARY EXAMINATION 2019
SCIENCE
PRIMARY SIX
BOOKLET A

Total Time for Booklets A and B: 1 h 45 min

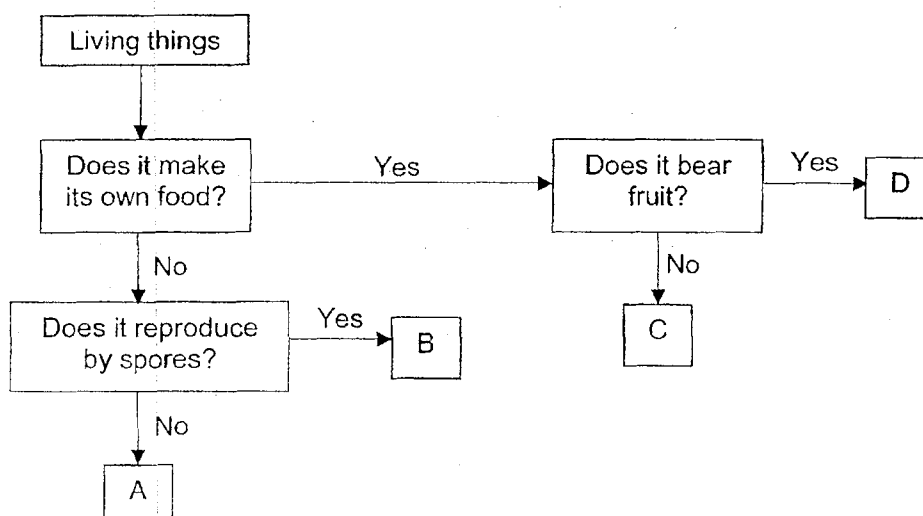
INSTRUCTIONS TO CANDIDATES

1. Write your name, index number and class in the spaces provided.
2. Do not turn over this page until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Shade your answer on the Optical Answer Sheet (OAS) provided.

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

(56 marks)

1 Study the flowchart below.



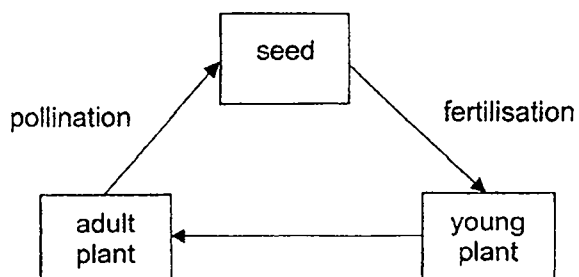
Which of the following most likely represents A, B, C and D?

	A	B	C	D
(1)	Bacteria	Animal	Fern	Flowering plant
(2)	Fungus	Fern	Bacteria	Flowering plant
(3)	Animal	Fungus	Fern	Flowering plant
(4)	Bacteria	Flowering plant	Animal	Fungus

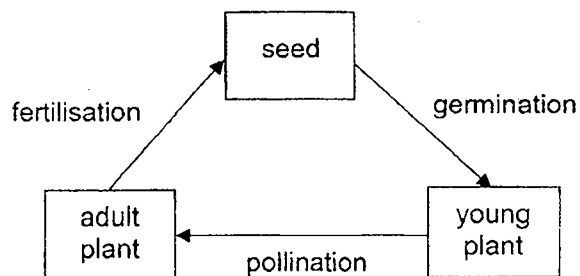
3

- 2 Which of the following diagrams shows the correct order of stages and processes in the life cycle of a flowering plant?

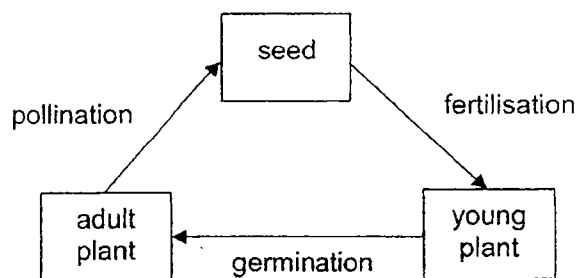
(1)



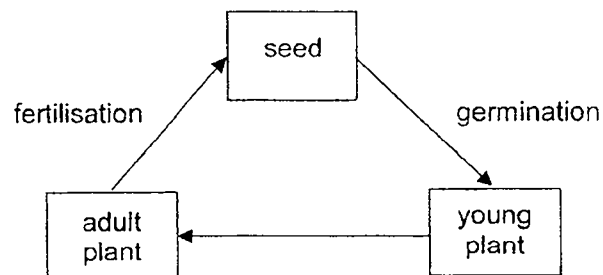
(2)



(3)

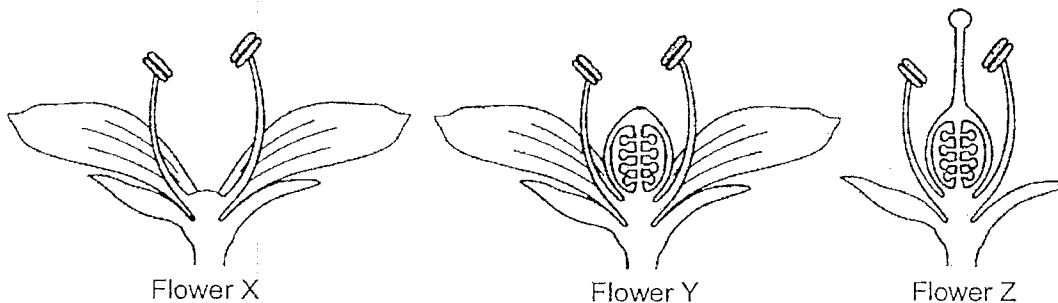


(4)



4

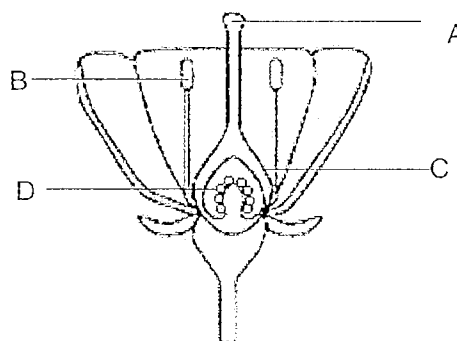
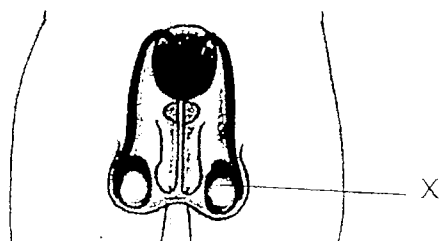
- 3 The diagram shows flowers, X, Y and Z, with some of their parts removed.



Charlie sprinkled some pollen grains from a similar flower over flowers X, Y and Z. The flowers were observed for the formation of fruits.

Which flower(s) would most likely develop into a fruit?

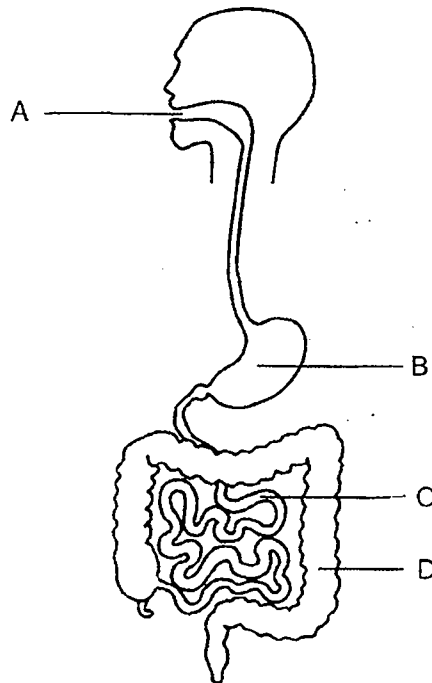
- (1) X only
 - (2) Z only
 - (3) Y and Z only
 - (4) X, Y and Z
- 4 The diagrams show the reproductive systems of a human and a plant.



Which part, A, B, C or D, in diagram 2 has a similar function as part X in diagram 1?

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

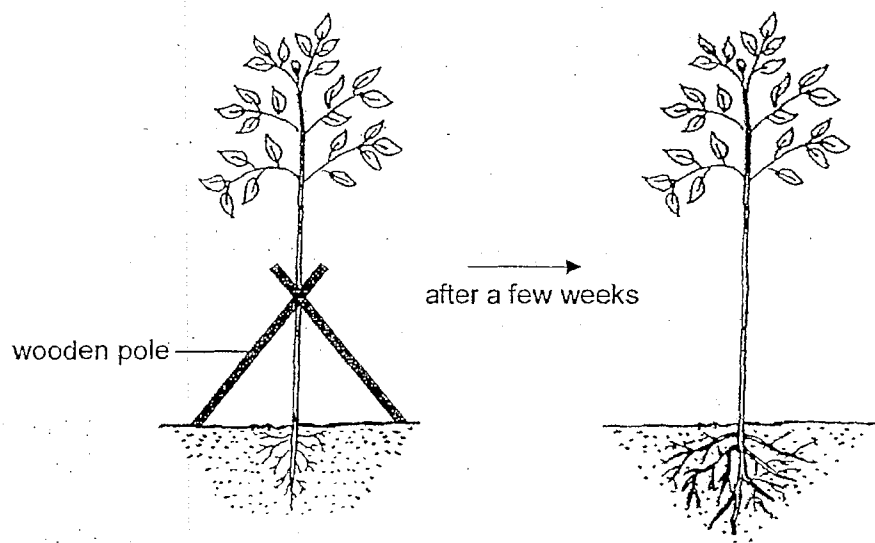
- 5 The diagram shows the human digestive system.



Which of the following shows the part(s) where digestive juices is/are released?

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

- 6 The diagram shows how some gardeners will attach wooden poles to a young plant when it is being planted into the ground. The poles are removed after a few weeks.

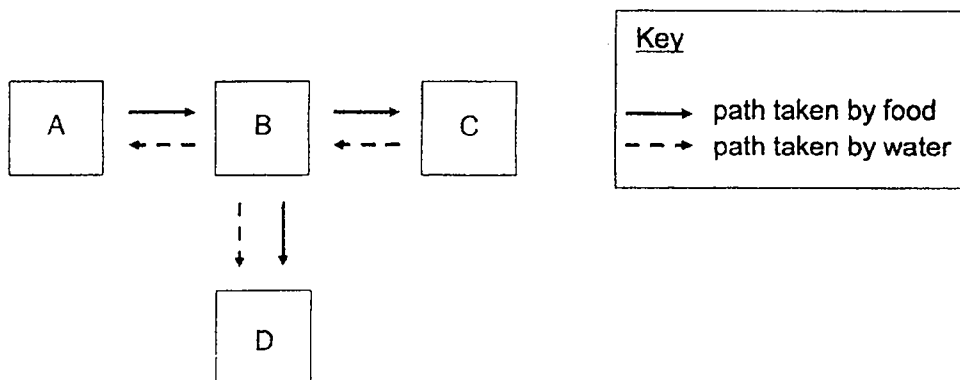


Based on the diagram, why does the young plant need to be attached to the wooden poles when it is being planted into the ground?

- (1) It has a weak stem.
- (2) The roots are unable to anchor it firmly to the ground yet.
- (3) The poles help transport more water to the leaves for photosynthesis.
- (4) The stem needs a support to grow upwards to reach for more sunlight.

7

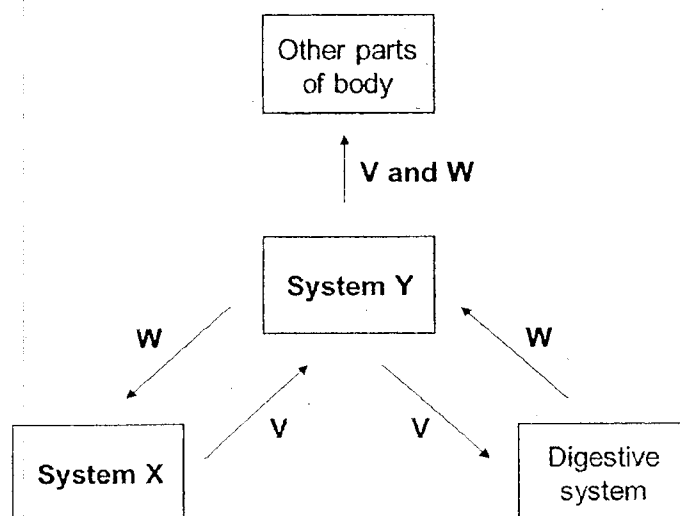
- 7 The diagram shows the different paths taken by food and water in a plant. A, B, C and D represent parts of the plant.



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

	A	B	C	D
(1)	leaf	stem	root	fruit
(2)	root	stem	fruit	leaf
(3)	flower	leaf	root	stem
(4)	stem	root	leaf	flower

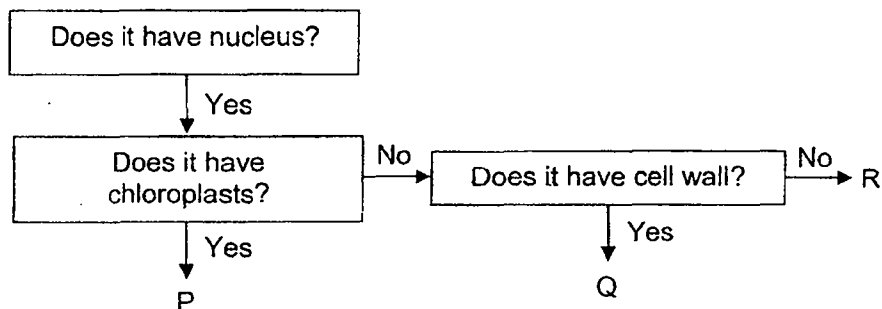
- 8 The chart shows how some substances are transported in the human body. The arrows represent the directions of how different substances are transported from one system to another.



Which of the following correctly identifies substances V and W and systems X and Y?

	Substance V	Substance W	System X	System Y
(1)	Digested food	Oxygen	Circulatory	Respiratory
(2)	Digested food	Oxygen	Respiratory	Circulatory
(3)	Oxygen	Digested food	Circulatory	Respiratory
(4)	Oxygen	Digested food	Respiratory	Circulatory

- 9 The diagram shows a flow chart describing three types of cells, P, Q and R.



Which of the following best represents where cells P, Q and R can be found?

	P	Q	R
(1)	Leaf of plant	Root of plant	Skin of human
(2)	Leaf of plant	Flower of plant	Stem of plant
(3)	Stem of plant	Skin of human	Root of plant
(4)	Stem of plant	Flower of plant	Root of plant

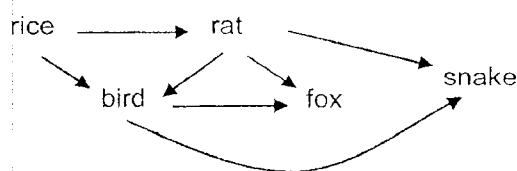
- 10 William recorded the number of organisms he saw on a tree in the table below.

Organism	Number of organisms
bird	2
ant	10
butterfly	3
aphid	5
caterpillar	7
fern	2

Based on the table, which of the following statements is correct?

- (1) There are 6 communities living on the tree.
- (2) There are 5 communities living on the tree.
- (3) There are 6 populations of organisms living on the tree.
- (4) There are 5 populations of organisms living on the tree.

- 11 The diagram represents a food web in a farm.

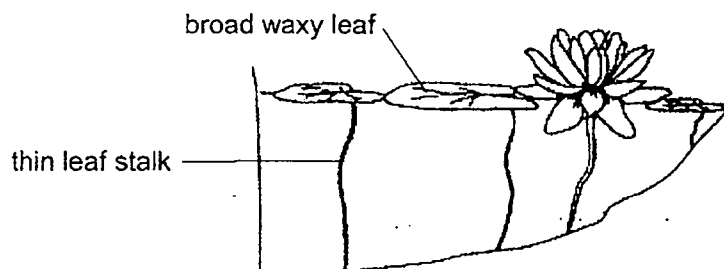


The farmer noticed that although the number of rice plants were the same as the previous year, there was an increase in the mass of rice he harvested.

Which of the following is a possible cause for the increase in the mass of rice harvested?

- (1) An increase in the population of rats.
- (2) A decrease in the population of foxes.
- (3) An increase in the population of birds.
- (4) An increase in the population of snakes.

- 12 The diagram shows the water lily plant in a pond.

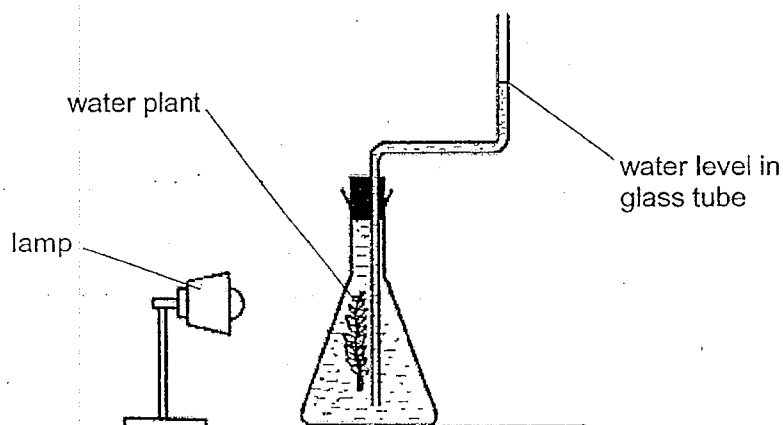


The broad waxy leaf of the water lily plant floats on the surface of the water and carries out gaseous exchange with the surrounding atmosphere.

Which one of the following is **incorrect**?

- (1) The broad leaf helps to trap more light.
- (2) The thin leaf stalk traps air and helps it float.
- (3) The waxy leaf prevents water from weighing it down.
- (4) The stomata on the upper surface of the leaf allows gaseous exchange with the surrounding air.

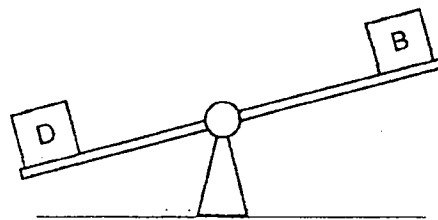
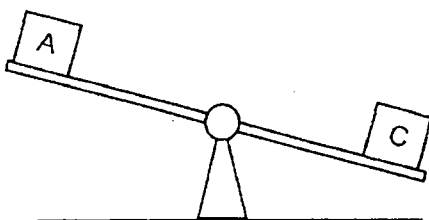
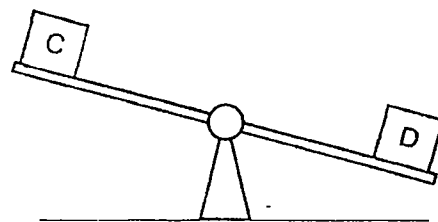
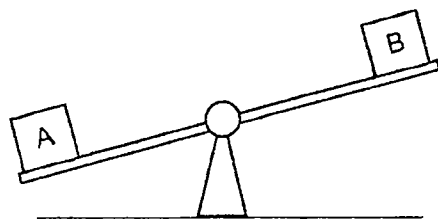
- 13 Dave conducted an experiment using a set-up shown below. He switched on the lamp and observed that the position of the water level in the glass tube changed after some time.



Which direction did the water level in the glass tube move and what was the reason for the movement?

	Direction moved	Reason for the movement
(1)	↑	Water is taken in by the plant.
(2)	↑	Oxygen is produced by the plant.
(3)	↓	Oxygen is produced by the plant.
(4)	↓	Carbon dioxide is taken in by the plant.

- 14 Study the containers, A, B, C and D, in the diagrams.



Which container has the largest mass?

- (1) A
 - (2) B
 - (3) C
 - (4) D
- 15 Study the table below that indicates the state of substances X, Y and Z at certain temperatures.

Substance	State of substance at		
	30°C	60°C	100°C
X	liquid	liquid	gas
Y	liquid	gas	gas
Z	solid	solid	solid

Based on the information above, which of the following statements is correct?

- (1) Substance X has the highest boiling point.
- (2) Substance Z has the highest melting point.
- (3) Substance X has the same melting point as substance Y.
- (4) Substance Y has a higher melting point than substance Z.

- 16 David poured the same amount of water on three identical towels, J, K and L. He then hung the towels at three different locations in the garden.

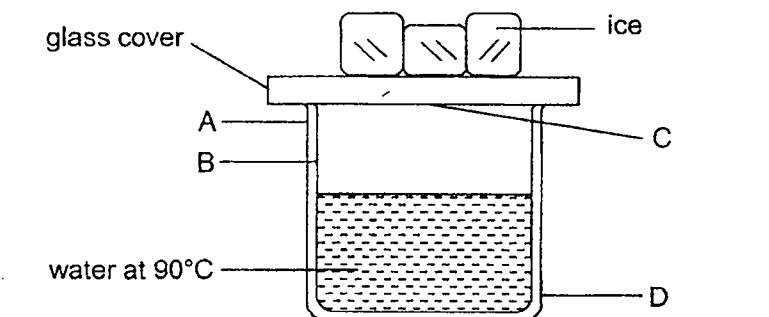
He recorded the mass of each towel at the start of the experiment and after two hours in the table below.

Towel	Mass of towel (g)	
	At start	After 2 hours
J	1500	1050
K	1500	1200
L	1500	1150

Based on the results, under which condition(s) was Towel J hung?

- (1) shady
- (2) sunny
- (3) shady and windy
- (4) sunny and windy

- 17 Edward set up an experiment as shown in the diagram.

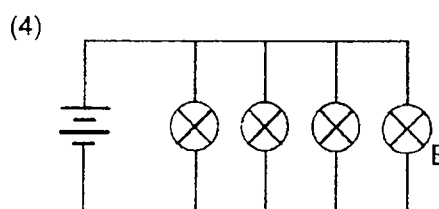
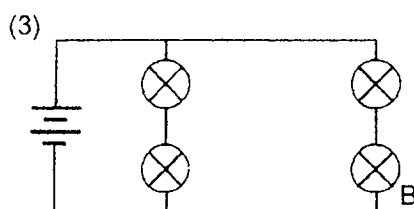
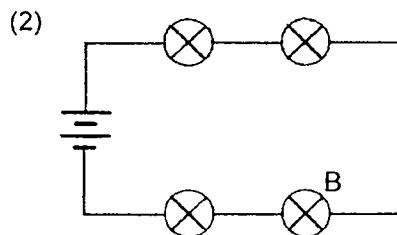
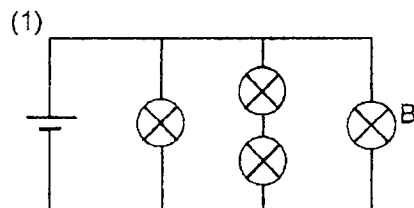


After a while, he noticed that some water droplets had formed. At which two parts, A, B, C or D, did the water droplets form?

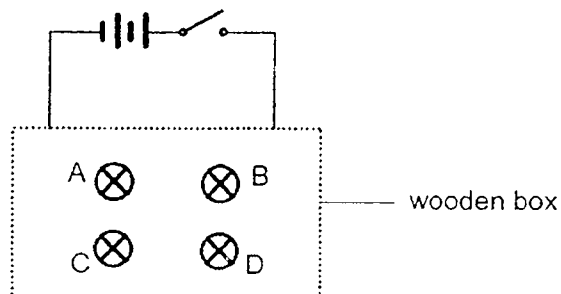
- (1) A and B
- (2) A and D
- (3) B and C
- (4) C and D

- 18 Leonard set up four different circuits using identical bulbs and batteries as shown. All the electrical components are in working condition.

In which circuit will bulb B be the dimmest?



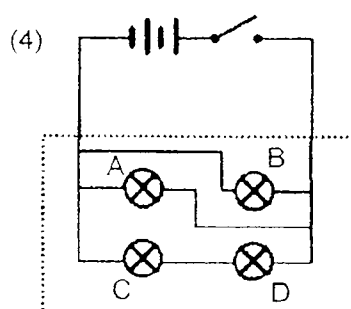
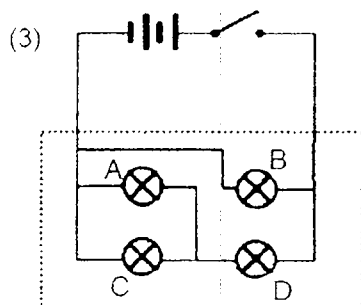
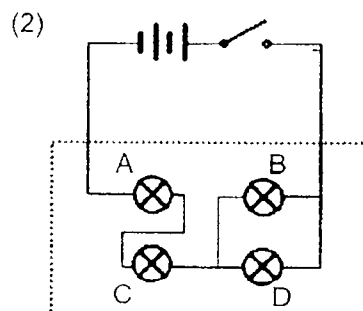
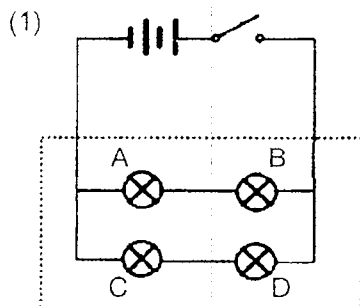
- 19 Bulbs A, B, C and D were connected in a circuit hidden in a wooden box as shown. All the bulbs lit up when the circuit was closed.



Larry removed one bulb from the circuit each time and observed what happened to the remaining bulbs. His observations were recorded in the table below.

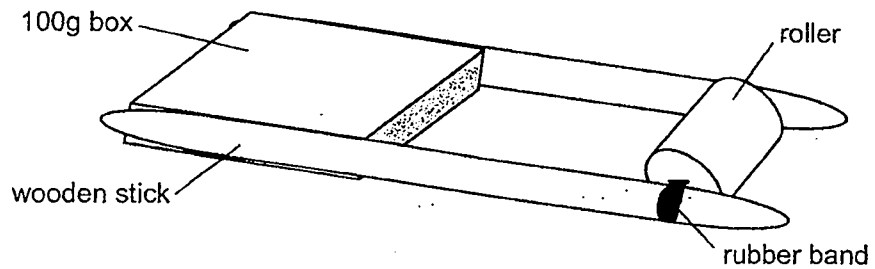
Bulb removed	Bulb(s) lit
A	B, C and D
B	A, C and D
C	A, B and D
D	B only

Which of the following correctly shows the circuit hidden in the wooden box?



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- 20 Max made a toy as shown.

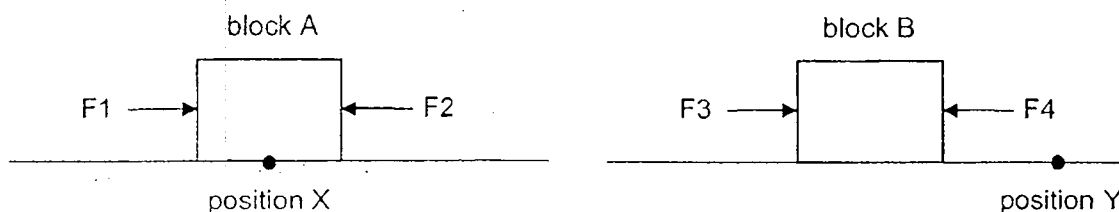


When Max turned the roller 10 times and placed the toy on the table, the toy moved forward. He replaced the box with an identical box of 50g and repeated his experiment. He noticed that the toy moved further.

Which of the following explains why the toy was able to move a further distance in the second experiment?

- (1) There is less air resistance acting on the toy.
- (2) There is less frictional force acting on the toy.
- (3) There is more gravitational force acting on the toy.
- (4) There is more elastic spring force acting on the toy.

- 21 Alan placed two identical blocks on his desk. He exerted forces F_1 and F_2 on block A at the same time and forces F_3 and F_4 on block B all at the same time.



Which of the following would result in block A remaining at position X and block B moving to position Y?

	Block A remaining at position X	Block B moving to position Y
(1)	F_1 is less than F_2	F_3 is the same as F_4
(2)	F_1 is more than F_2	F_3 is more than F_4
(3)	F_1 is the same as F_2	F_3 is less than F_4
(4)	F_1 is the same as F_2	F_3 is more than F_4

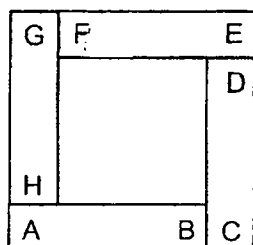
- 22 Which of the following two activities contribute to an increase in the amount of carbon dioxide in the air?

- A Using a bicycle to get around.
- B Using reusable bags when shopping.
- C Clearing forest area to make factories.
- D Burning trash instead of dumping them into landfills.

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

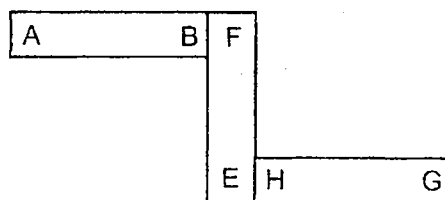
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- 23 Four bar magnets with their ends marked A to H are arranged as shown.

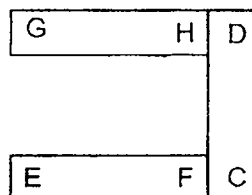


Which of the following diagrams shows a possible arrangement using three of the magnets?

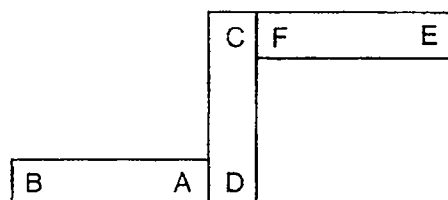
(1)



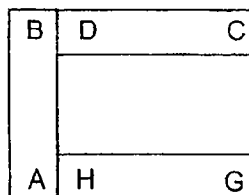
(2)



(3)



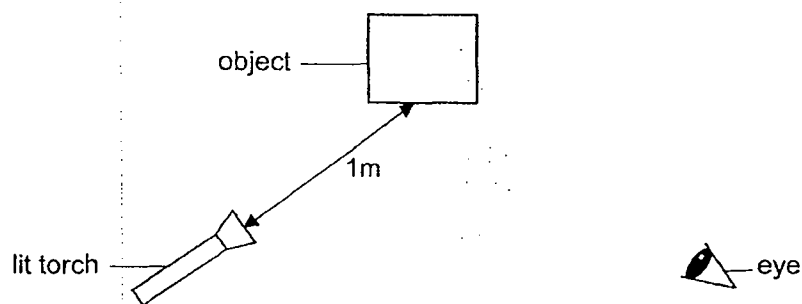
(4)



24 In a scrap yard, electromagnets are used to separate objects. Which of the following explains why they are used?

- (1) Electromagnets have only one pole.
- (2) Electromagnets can repel non-magnetic objects.
- (3) Electromagnets are able to attract magnetic objects.
- (4) Electromagnets are strong and made of strong metal.

25 Four objects, A, B, C and D, are separately placed from a distance of one metre from a lit torch as shown in the diagram.

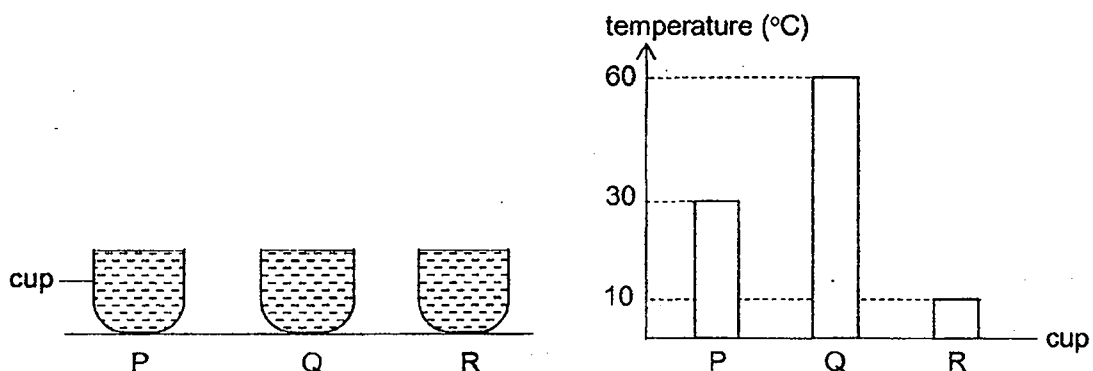


Which of the object(s) can reflect light from the torch into the eye?

- A brown wood
- B polished mirror
- C shiny metal
- D clear glass

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

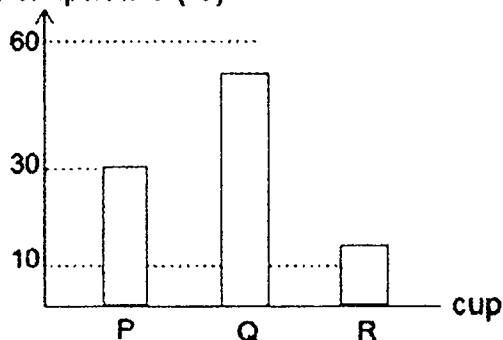
- 26 Three identical cups, P, Q and R, were filled with water at different temperatures and left at room temperature (30°C) as shown. The graph below shows the temperatures of the water in each cup at the start of the experiment.



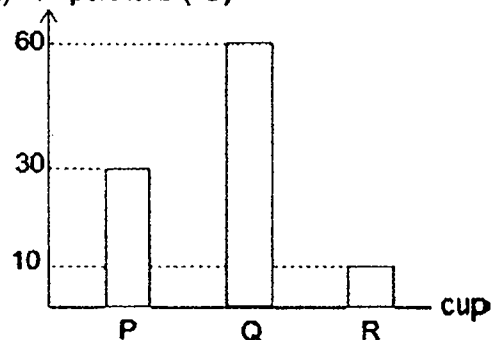
The temperatures of the water were taken again at the end of ten minutes.

Which of the graphs shows the most likely temperature of the water in each cup at the end of ten minutes?

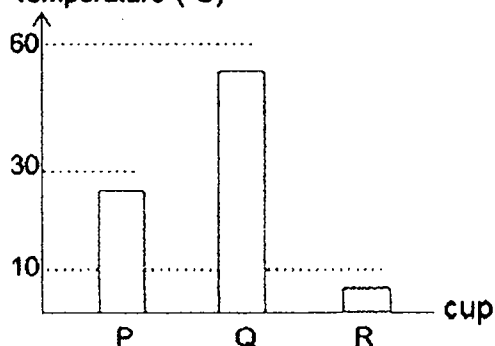
(1) temperature ($^{\circ}\text{C}$)



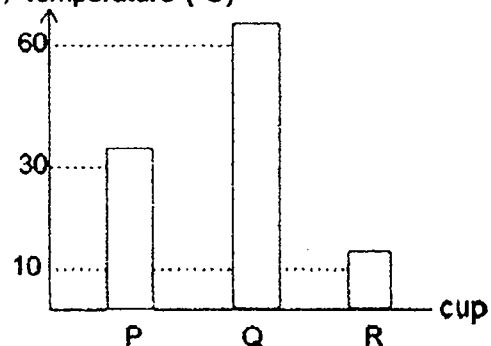
(2) temperature ($^{\circ}\text{C}$)



(3) temperature ($^{\circ}\text{C}$)

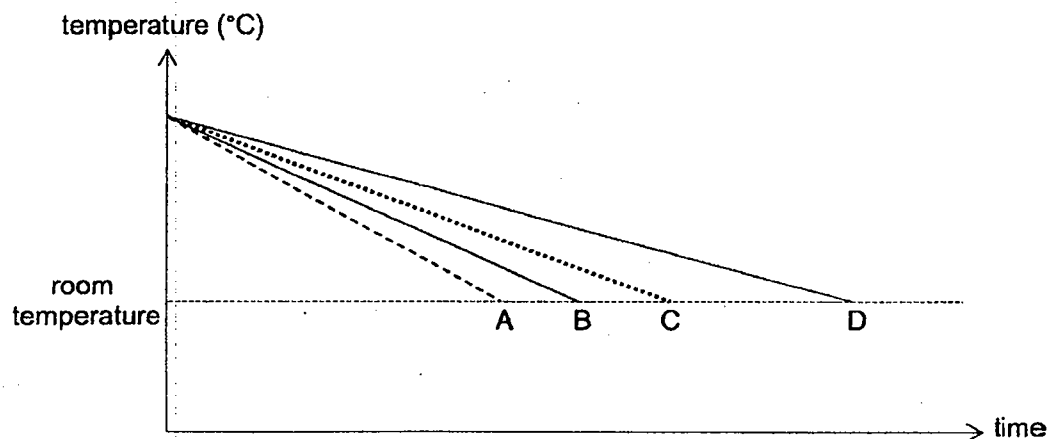


(4) temperature ($^{\circ}\text{C}$)



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- 27 Four different containers of the same volume were filled with equal amount of hot water and allowed to cool to room temperature. The graph below shows the results.

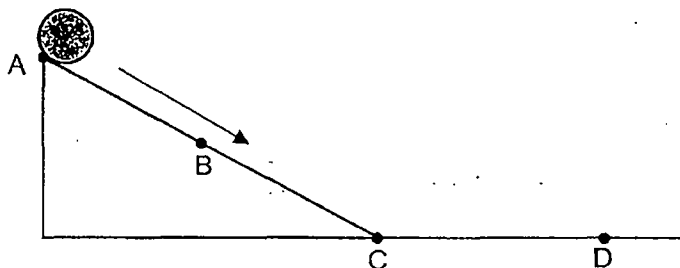


Based on the information above, which container, A, B, C or D, is the poorest conductor of heat?

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

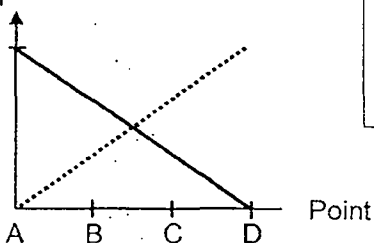
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- 28 The ball, as shown in the diagram, rolls down from Point A. It rolls past Points B and C before finally stopping at Point D.



Which of the following graphs shows the changes in the amount of gravitational potential energy and kinetic energy of the ball from Point A to Point D?

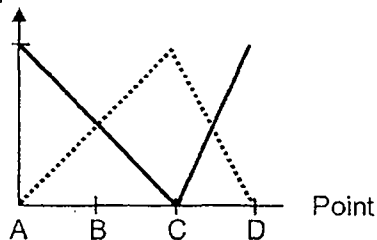
- (1) amount of energy



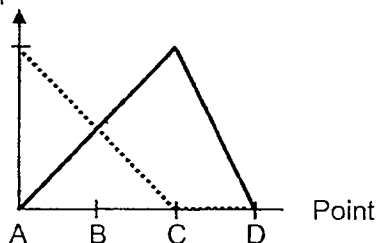
Key

— Gravitational potential energy
 Kinetic energy

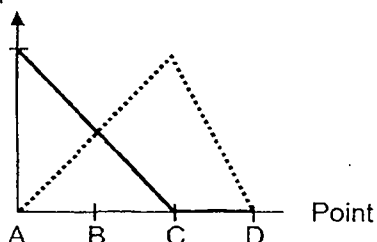
- (2) amount of energy



- (3) amount of energy



- (4) amount of energy



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Anglo-Chinese School (Junior)
Anglo-Chinese School (Primary)

PRELIMINARY EXAMINATION 2019
SCIENCE
PRIMARY SIX
BOOKLET B

Name: _____ () Class: Primary 6 _____

Date: 27 August 2019

Total Time for Booklets A and B: 1 h 45 min

 Parent's/ Guardian's signature

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5. Write your answers in this booklet.

BOOKLET	MAX MARKS	MARKS OBTAINED
A	56	
B	44	
Total	100	

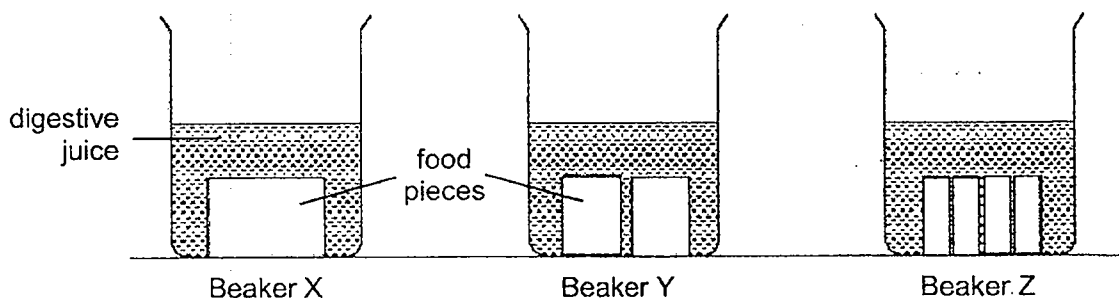
This booklet consists of 15 printed pages including this cover page.

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

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

- 29 Ranjit wanted to investigate the factors that affect the digestion of food in the human digestive system.

- (a) He conducted an experiment to find out if the size of food affected how fast the food was being digested. He cut up pieces of the same food and placed them in three beakers of digestive juices as shown. The food in each beaker has the same total mass.



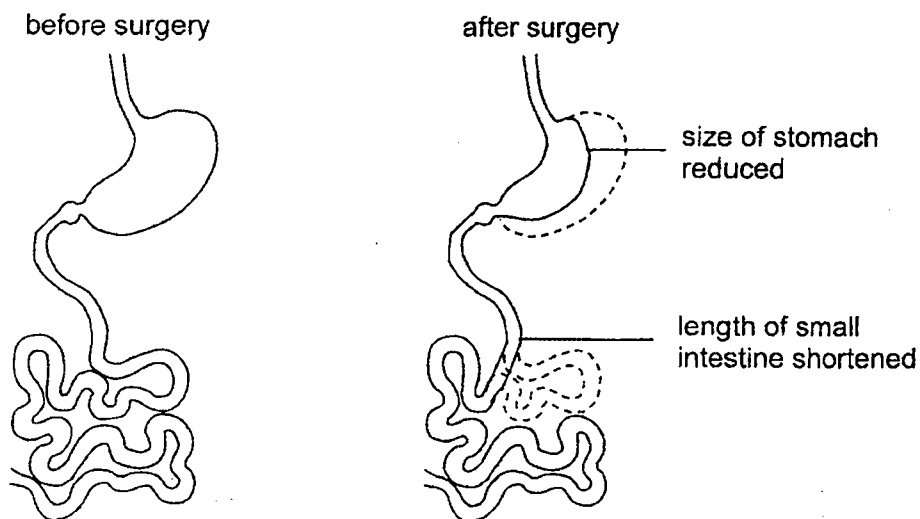
After two hours, Ranjit measured the mass of the food pieces left in each beaker and recorded the results in the table as shown.

Beaker	Mass of food pieces (g)	
	Start of experiment	End of experiment
X	100	91
Y	100	77
Z	100	52

- (i) Explain why the mass of the food pieces in all the three beakers decreased. [1]

- (ii) Based on the results, explain how chewing food well before swallowing can help food to be digested faster. [1]

- (b) Ranjit found out that a type of surgery can reduce the size of the stomach and shortens the length of the small intestine.

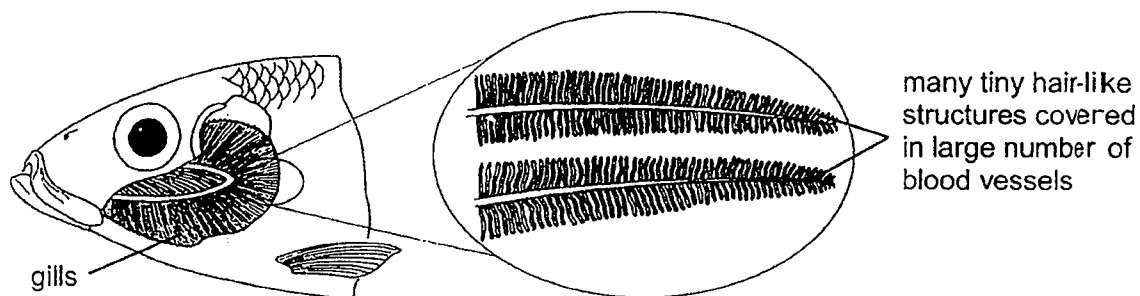


Based on the diagram, explain how the digestion of food in the stomach and the small intestine will be affected, immediately after the surgery. [2]

Stomach: _____

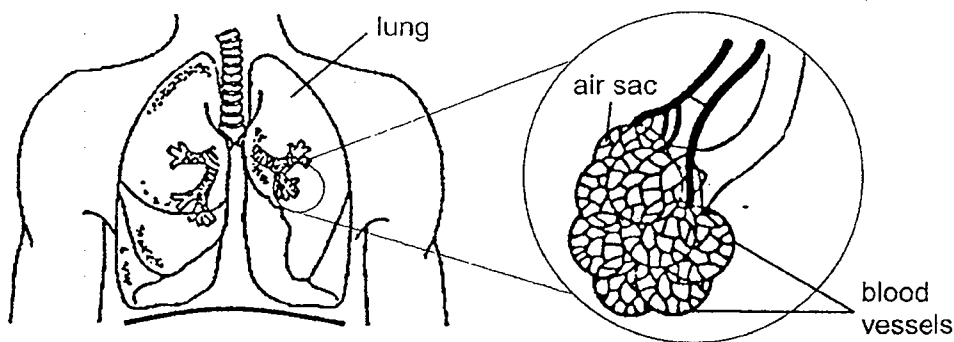
Small intestine: _____

- 30 The diagram shows the respiratory system of a fish. Fishes absorb dissolved oxygen from the water as the water passes through the gills.



- (a) How does having many tiny hair-like structures help the fish get more dissolved oxygen? [1]

The diagram below shows the human respiratory system.



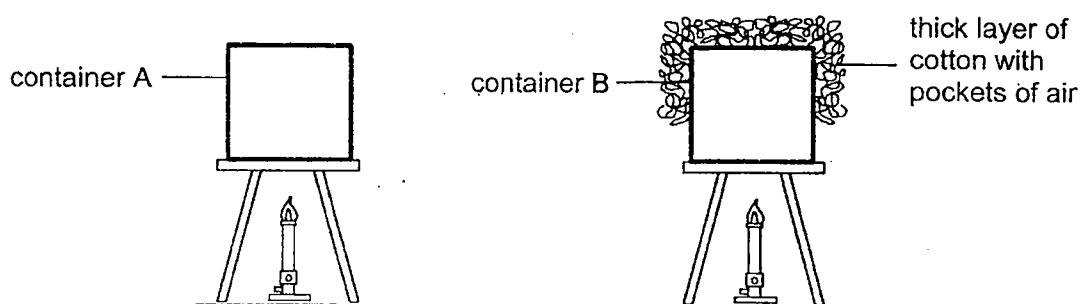
- (b) How does oxygen in the environment reach the blood vessels of the air sacs? [1]

- (c) Based on the diagrams, describe one similarity between the structure of the gills and the lungs. [1]

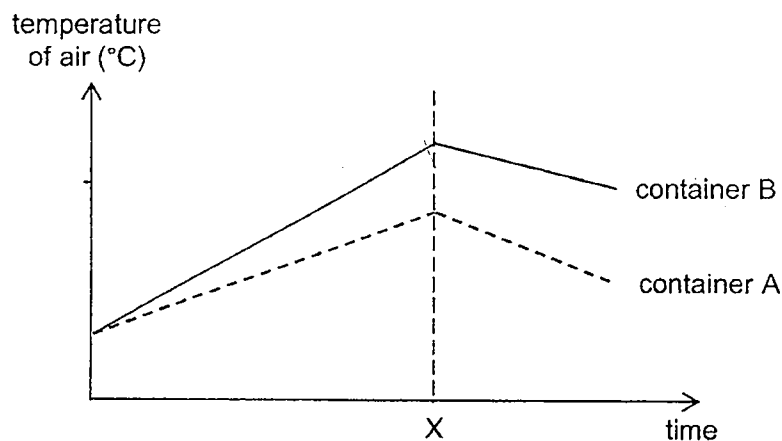
- 31 (a) What is the difference between heat and temperature?

[1]

Two similar containers, A and B, were heated and the temperature of air in each container was taken over a period of time. Container B was covered by a thick layer of cotton with pockets of air.



The graph shows the results of the experiment.



- (b) (i) Based on the results of the experiment, describe the difference in the temperature of air between container A and container B as they were heated. [1]

- (b)(ii) How does the cotton wool result in the difference between the temperatures of air in both containers when they were being heated? [1]

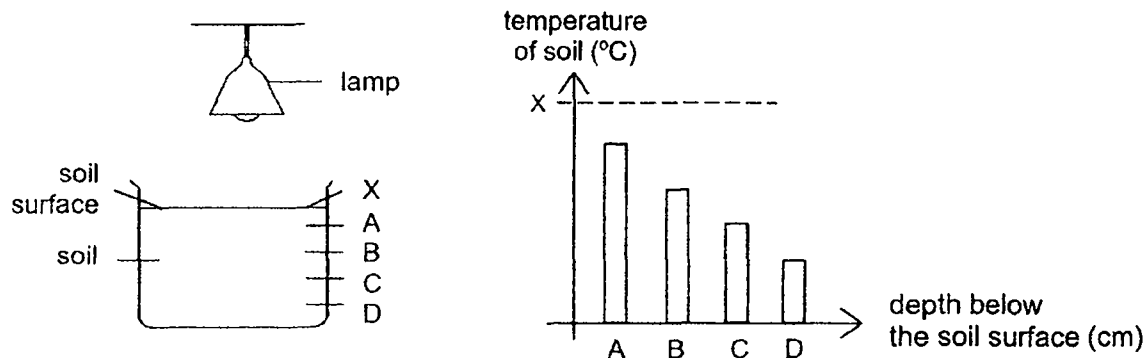
- (c) What was done at time X to cause a change in the temperature of air in both the containers? [1]

Look at the picture of the animal below.



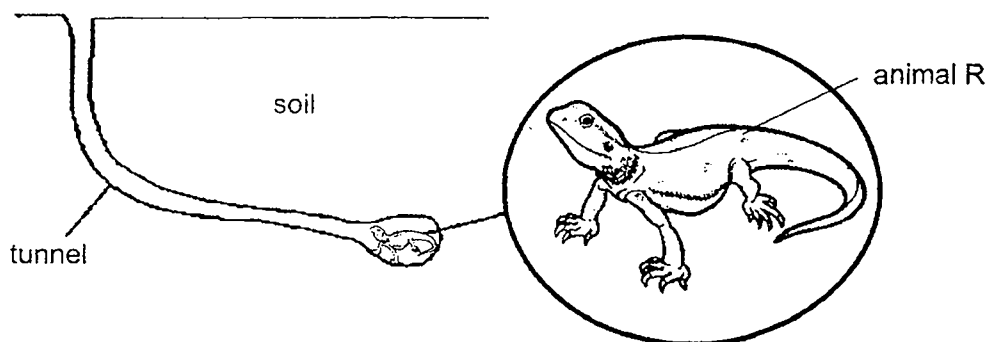
- (d) The animal has thick long fur. Based on the results of the experiment, explain how the thick long fur keeps the animal warm in cold environments. [1]

- 32 Ian conducted an experiment to find out how temperature changes with the depth of soil using the set-up shown. After the lamp had been turned on for one hour, Ian recorded the temperature of the soil in the graph. A, B, C and D are different depths below the soil surface and X is at the soil surface.



- (a) Based on the results, state the relationship between the depth below the soil surface and temperature of soil. [1]

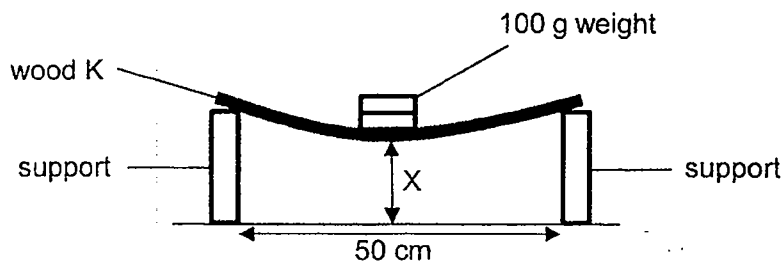
Animal R lives in a desert which is hot and dry. It stays in an underground tunnel during the day.



- (b) Based on Ian's experiment, explain how staying underground during the day helps animal R survive in its environment. [1]

- (c) Based only on the diagram of animal R, state a structural adaptation it has that enables it to dig a tunnel in the soil. [1]

- 33 An experiment was conducted to compare the flexibility of two different types of wood, K and L. Wood K was placed on two identical supports that were positioned 50 cm apart. Different numbers of 100 g weights were placed on wood K and the distance X was measured as shown.



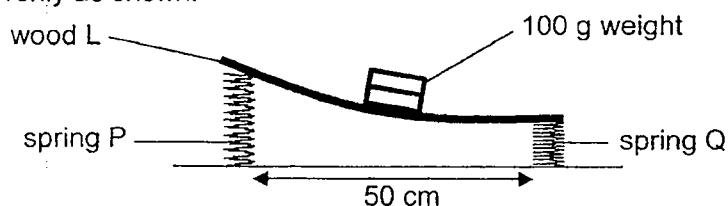
The experiment was repeated with wood L of the same size and the results were recorded in the table below.

Number of 100 g weight	Distance X (cm)	
	Wood K	Wood L
0	6.0	6.0
1	5.3	5.6
2	4.6	5.2
3	3.9	4.8
4	3.3	Wood L broke
5	2.7	

- (a) Based on the results, which wood, K or L, is less flexible? Explain your answer. [1]

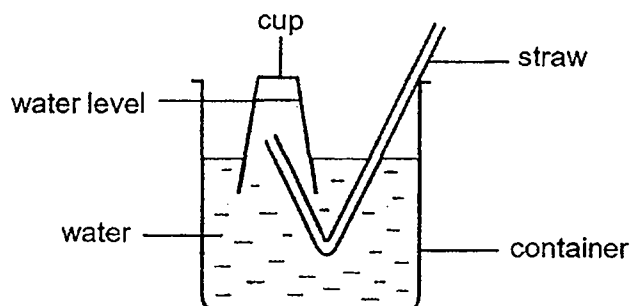
- (b) Name one other variable that must be kept constant for a fair test. [1]

In another experiment, wood L was placed on two different springs of equal size, P and Q, that were positioned 50 cm apart. Some 100 g weights were placed on wood L and caused wood L to tilt unevenly as shown.



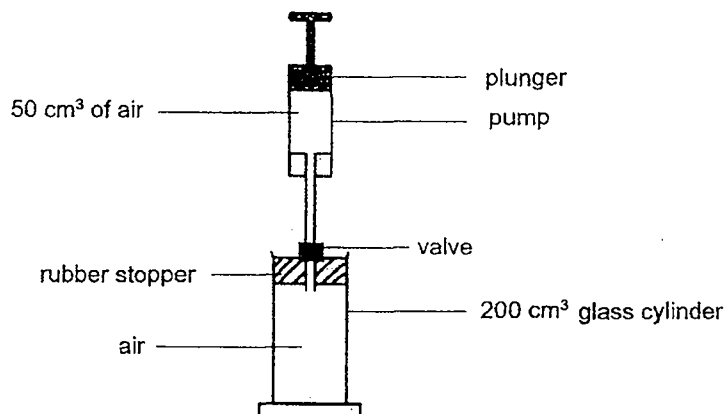
- (c) Based on the above observation only, why did wood L tilt unevenly? [1]

- 34 Ivan wanted to investigate the properties of air. He filled a cup with water and inverted it into a container of water as shown.



- (a) What will happen to the water level in the cup when air is blown into the cup through the straw? Explain your answer. [2]

Ivan then carried out another experiment. He used a 200 cm^3 glass cylinder that was filled with air and was connected to a pump which contained 50 cm^3 of air. He used a valve which prevented the air in the glass cylinder from flowing back into the pump as shown.

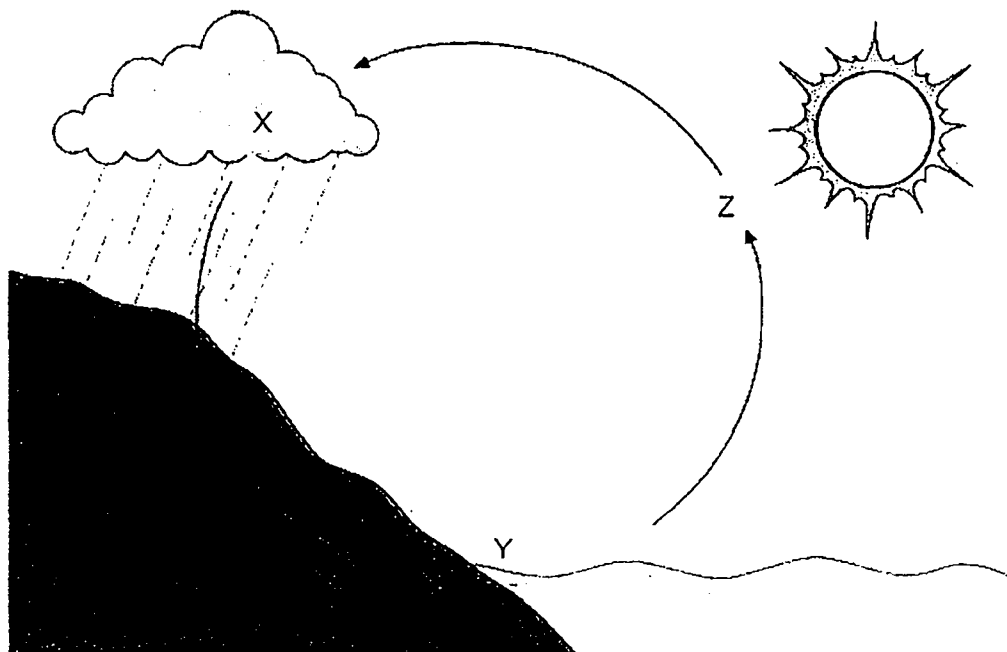


50 cm^3 of air went into the glass cylinder when the plunger was pushed all the way into the pump. The plunger was pushed all the way once.

- (b) What is the volume of air in the glass cylinder? Explain why. [1]

- (c) Will the mass of air in the glass cylinder increase, decrease or remain the same? Explain your answer based on the property of air. [1]

- 35 The diagram shows the water cycle. X, Y and Z represent the different parts of the water cycle.



- (a) Why is the Sun important in the water cycle? [1]

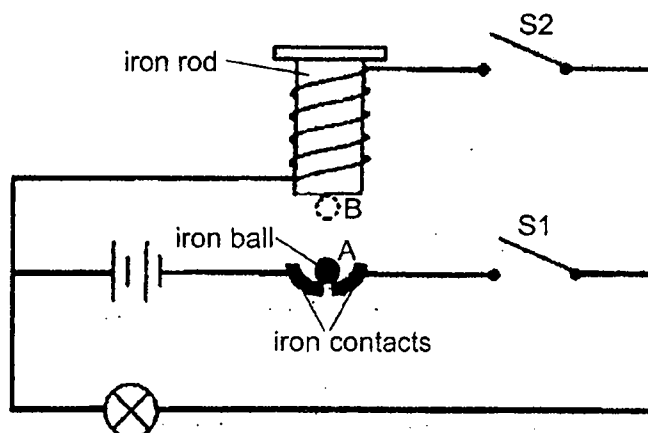
- (b) Complete the following with X, Y or Z. [2]

(i) Condensation: _____ to _____

(ii) Evaporation: _____ to _____

- (c) Describe what will happen to the water cycle if condensation did not take place? [1]

- 36 Study the circuit shown in the diagram carefully. The iron ball was resting on two iron contacts.



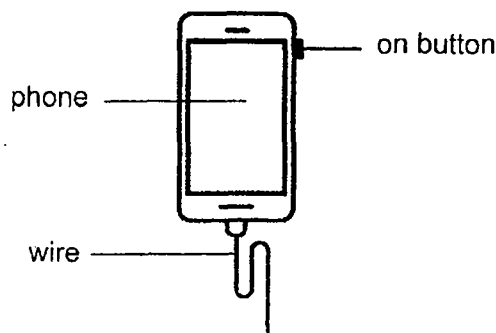
- (a) What could be observed in the circuit when only switch S1 was closed? [1]

When both switches S1 and S2 were closed, the iron ball moved repeatedly from A to B and back to A.

- (b) Explain why the iron ball moved up and down repeatedly. [2]

- (c) What happened to the bulb when both switches S1 and S2 were closed? [1]

37 Gabriel wanted to use his phone.

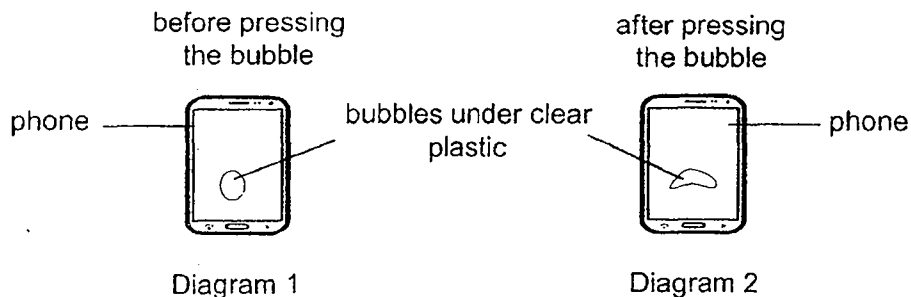


(a) What force(s), push, pull or both, did he apply when he:

(i) unplugged the wire. _____ [½]

(ii) switched on the phone. _____ [½]

Gabriel pasted a layer of clear plastic on his phone screen. However, there was an air bubble trapped under the clear plastic as shown in diagram 1. Diagram 2 shows what happened to the air bubble when he pressed it.

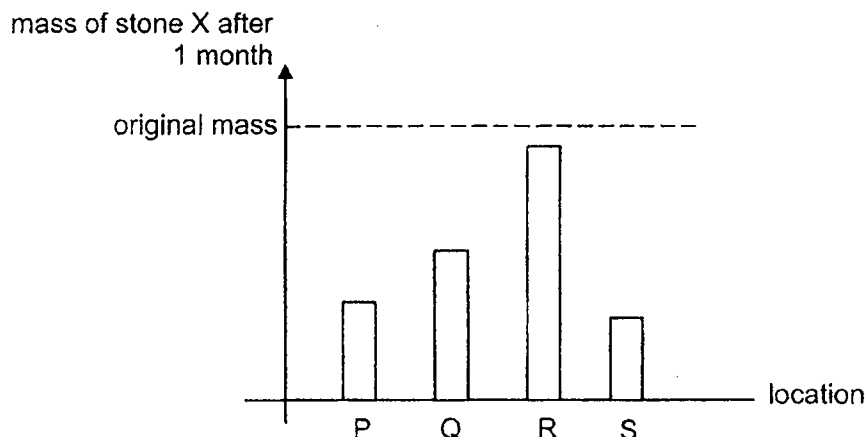


(b) What is the effect of force on the bubble? [1]

(c) Gabriel noticed that the bubble had increased in size when he was outdoors on a hot day. Explain why this is so. [1]

- 38** Sometimes rain mixes with pollutants in the air to form acid rain. David wants to investigate the effects of acid rain on stone X.

He collected four beakers of rainwater from four different locations, P, Q, R and S. He added an identical piece of stone X to each beaker of rainwater and recorded its mass after a month. The graph shows the results.

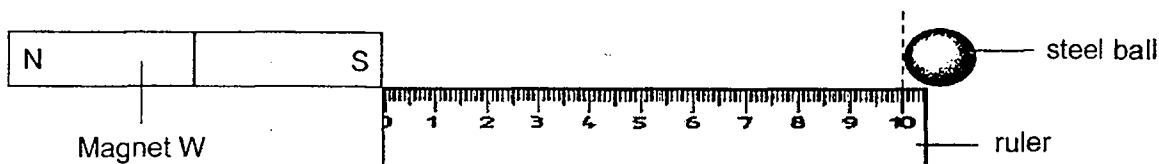


- (a) David used the same volume of rainwater for each of his set-ups. How does this ensure a fair test? [1]

- (b) Based on the results, which location, P, Q, R or S, would be most suitable to display a statue made from stone X? Explain why. [1]

- (c) State two other negative effects of acid rain.

- 39 Herman set up an experiment as shown. He moved the steel ball slowly from the 10 cm mark along the ruler towards Magnet W. He recorded the distance, d , at the point where the magnet attracted the steel ball. He repeated the experiment using Magnets X, Y and Z.



The table shows the results for all the four magnets, W, X, Y and Z.

Magnet	Distance d (cm)
W	6
X	8
Y	3
Z	5

- (a) Why did the steel ball get attracted to the magnet? [1]

- (b) Based on the result of his experiment, arrange the magnets according to their strength from the strongest to the weakest. [1]

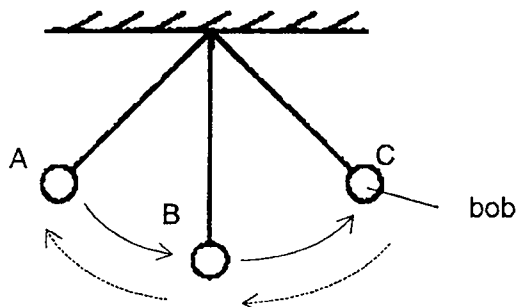
- (c) In the table, tick (✓) the variable(s) that Herman must keep the same to ensure a fair test? [1]

Variables	Tick (✓)
Magnets of different sizes	
Same steel ball for each experiment	
Magnets of the same magnetic strength	

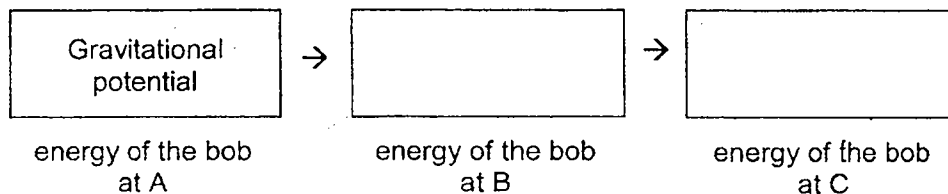
- (d) Herman replaced Magnet Y with a bigger-sized magnet. It attracted the steel ball from a distance of 3 cm. What can you conclude about magnetic strength and size of magnet? [1]

- (e) Herman dropped Magnet X several times and tested it out again. Will Magnet X attract the steel ball from a distance of 8 cm, more than 8 cm or less than 8 cm? Explain your answer. [1]

- 40 Eddy used a set-up as shown to find out the time taken for a bob to make one complete swing. The bob makes one complete swing when it moves from A to C and back to A.



- (a) Fill in the two empty boxes below to show the energy conversions as the bob swings from A to C. [1]



Eddy conducted four experiments. He did not change the size of bobs and type of strings. His results are shown in the table below.

Experiment	Mass of bob (units)	Length of string (units)	Time taken for one complete swing (units)
W	3	8	9
X	4	14	12
Y	5	8	9
Z	5	20	14

- (b) If Eddy wanted to find out how the length of string would affect the time taken for one complete swing, which two experiments should he use to make a conclusion? [1]

Experiments _____ and _____

- (c) Based on experiments W and Y, what can Eddy conclude? [1]

Answer Sheets

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

29ai.The digestive juice in the beakers digested the food pieces into simpler substances.

29aii.It breaks down food into smaller pieces and increases surface area for digestive juices to act on the food.

29b.stomach –less space to store food, so there will be less digestion

Small intestine-.There will be less surface area so there is less time for the food to be digested.

30a.The fish will have more exposed surface area to absorb more dissolved oxygen.

30b.Air enters the lungs through the nose. Oxygen transported through the wild pipe into the air sacs is absorbed into the blood vessel.

30c.Both have large number of blood vessels.

31a.heat is a form of energy

31bi.Temperature of air in B increases faster than A.

31bii.The cotton wool that contains air which is a poor conductor of heat helps the air in B to loose heat to the surroundings slower.

31c.The fire on the candle was put out.

31d.The thick long fur helps to trap air in between the fur and air is a poor conductor of heat so the animal will lose heat to the surroundings slower.

32a.The deeper the depth below the soil surface, the lower the temperature of soil.

32b.When it is deeper, the soil will be cooler so animal R will gain heat to the surroundings slower and feel less hot.

32c.Animal R has claws.

33a.L. It took fewer weights before breaking.

33b.The spot where the weights were placed.

33c.Spring Q was less stiff than P and Compressed more so spring Q was shorter than P and caused wood L to tilt unevenly.

34a.The water level in the cup will drop. Air is a matter and will take up space so it will displace the water as there will be more air within the cup and less space for the water.

34b. 200cm^3 .The glass cylinder's volume is 200cm^3 and air does not have a definite volume so it will take up the volume of the glass cylinder.

34c.Increase.Air has mass so when there is more air, the glass cylinder will be heavier.

35a.The sun produces heat for the water to gain heat and evaporate.

35bi. Z to X 35bii.Y to Z

35c.There will not be any water droplets to form and eventually no rain will fall.

36a.The bulb will light up.

36b.The circuit became a closed circuit and the iron rod become a electromagnet and attract the ball. When the ball was attracts, the circuit become an open circuit so the iron rod lost its magnetism and the ball dropped again causing the circuit to be closed circuit again.

36c.The bulb will keep being switched on and off.

37i.Pull ii Push

37b.It caused the bubble to change shape

37c.Air under the clear plastic gained heat and expanded.

38a.so that any changes in the mass of stone after one month is only due to the location he collected the rainwater from and not other factors like volume of rainwater.

38b.R because the rainwater is least polluted as the mass of x decrease the least.

38c.It damages buildings and contaminated the water bodies.

39a.The steel bar is a magnetic material and magnets attract magnetic materials.

39b.X,W,Z,Y 39c.Same steel bar for each experiment

39d.The size of the magnet does not affect the magnetic strength.

39e.Less.When he dropped magnet x, it was losing its magnetism so it became weaker and attracted at a closer distance.

40a.Gravitational—Kinetic— Gravitational Potential

40b.Y and Z

40c.The mass of bob does not affect the time taken of one complete swing.