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NAN HUA PRIMARY SCHOOL
Preliminary Examination 2020
PRIMARY 6

SCIENCE

BOOKLET A

28 Multiple Choice Questions (56 marks)

Total Time for Booklets A and B: 1 hour 45 minutes

INSTRUCTIONS TO CANDIDATES

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

Marks Obtained

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

Name: _____ **(** **)** **Class: P 6** _____

Date: 26 August 2020 **Parent's Signature:** _____

This paper consists of 19 printed pages.

Section A: (28 × 2 marks = 56 marks)

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

1 Andrew spotted an animal, X, in a river and recorded his observations below.

Characteristics of animal X	
• Has hair	• Feeds on fish
• Swims fast	• Produces milk for its young

Which of the following groups of animals does animal X belong to?

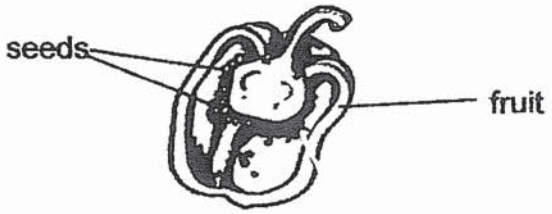
(1) Fish
(2) Insects
(3) Reptiles
(4) Mammals

2 The picture below shows the seed leaves of a seedling.

What is the function of the seed leaves?

(1) to protect the seedling
(2) to provide food for the seedling
(3) to absorb oxygen for the seedling
(4) to absorb carbon dioxide for the seedling to make food

3 The picture below shows a cross-section of a fruit.



Based on the picture above, which one of the following statements is true about the flower that this fruit has developed from?

(1) The flower has large petals.
(2) The flower has many ovules.
(3) The flower has many ovaries.
(4) The flower grows in a cluster.

4 Ben wanted to conduct an experiment to find out if the amount of water given to the seeds affects the germination of seeds.

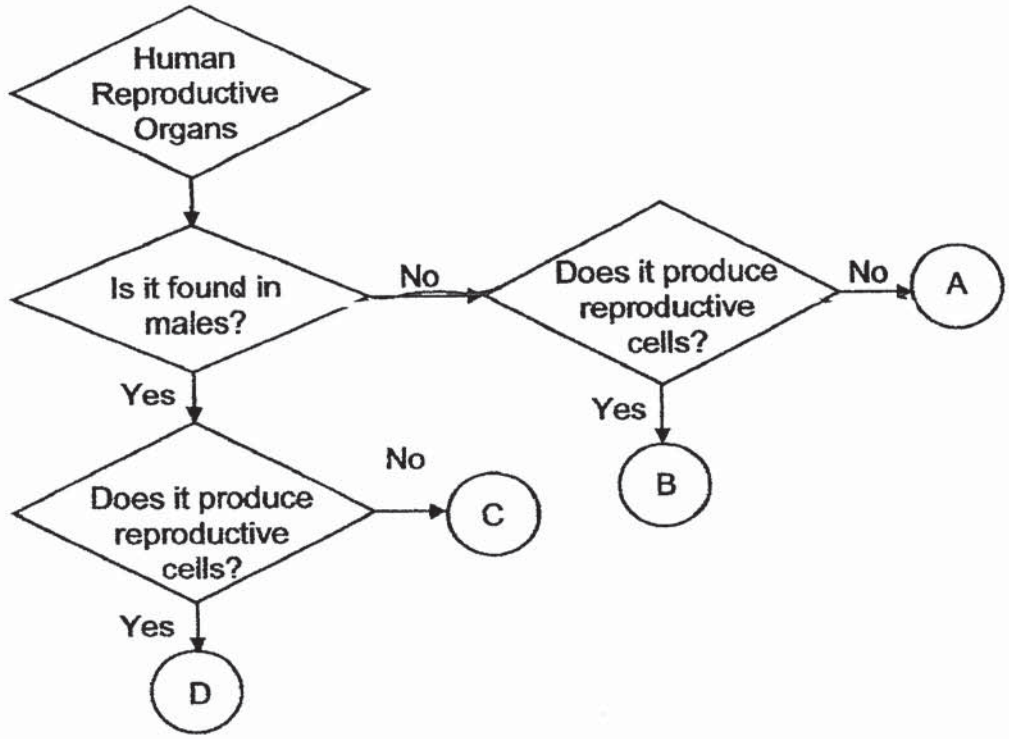
He set up four similar pots, W, X, Y and Z, with different conditions as shown below.

Variables	Pots			
	W	X	Y	Z
Number of seeds	10	30	30	30
Amount of soil (g)	300	500	500	500
Amount of water given daily (ml)	20	10	10	20
Temperature of room the pot is kept in (°C)	3	32	3	32

Which of the above set-ups should he use to ensure a fair test?

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

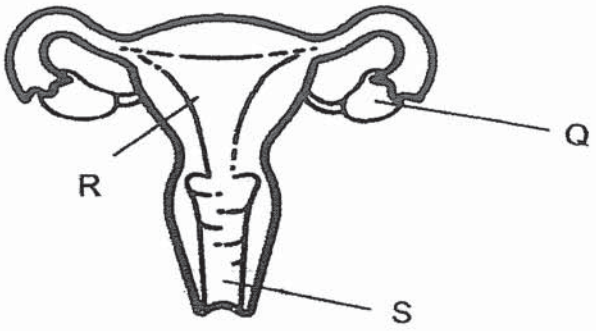
5 Study the flow chart below.



Which of the letters, A, B, C or D, represents the womb in the human reproductive system?

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

6 The diagram below shows the female human reproductive system.

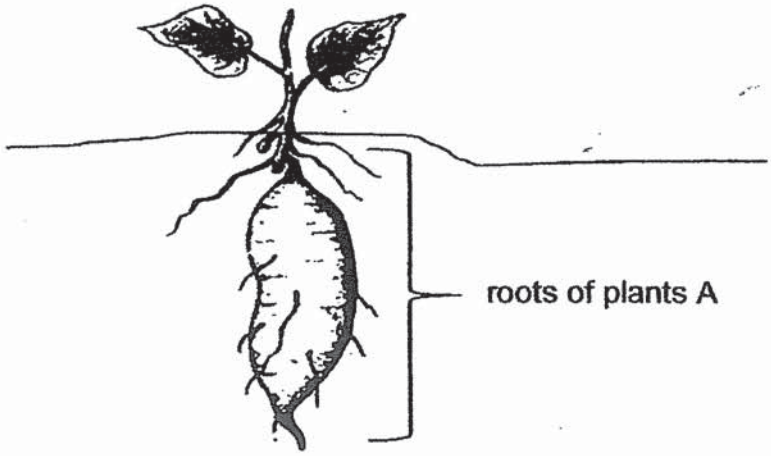


Which of the following statement(s) is/are correct?

A Eggs are produced in S.
B The fertilised egg will develop in R.
C Q releases the sperms needed for fertilisation to take place.

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

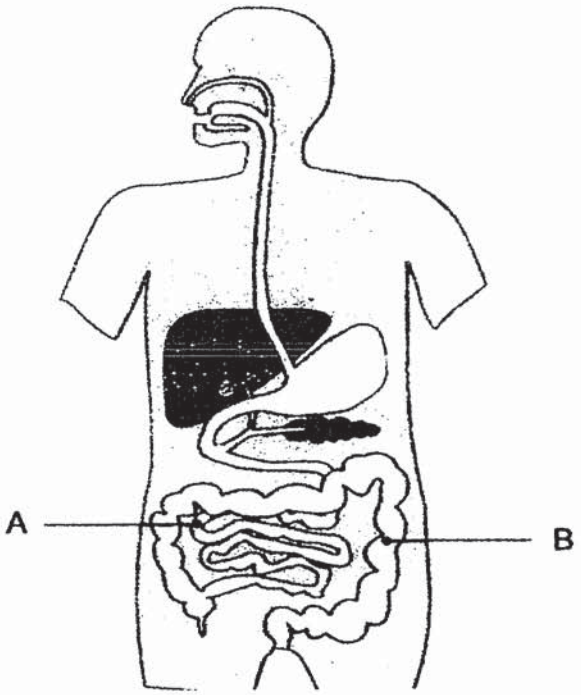
7 The diagram below shows plant A.



Which one of the following is not a function of the roots of plant A?

(1) It stores excess food.
(2) It anchors the plant to the ground.
(3) It holds the plant upright to reach for sunlight
(4) It absorbs water and mineral salts for the plant.

8 The diagram below shows the digestive system of a human.



Which of the following shows the correct functions of part A and B?

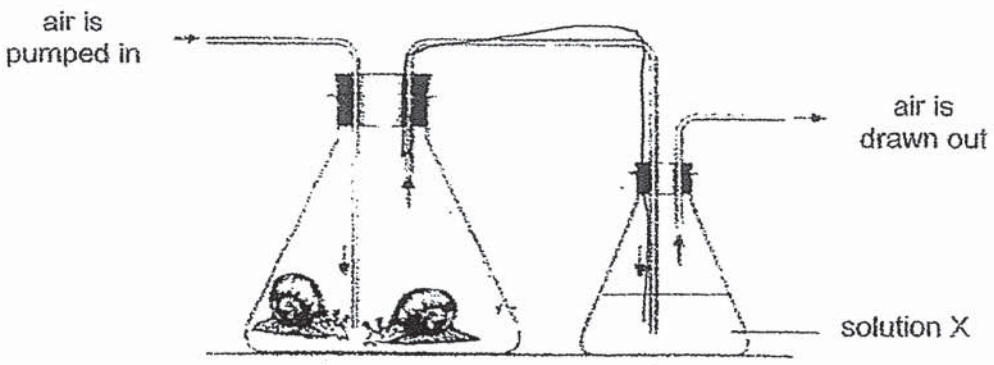
	Part A	Part B
(1)	digestion of food	digestion of food
(2)	digestion of food	absorption of water from undigested food
(3)	digestion of food	absorption of digested food into the bloodstream
(4)	absorption of digested food into the bloodstream	digestion of food

9 Which of the following are parts of the respiratory system?

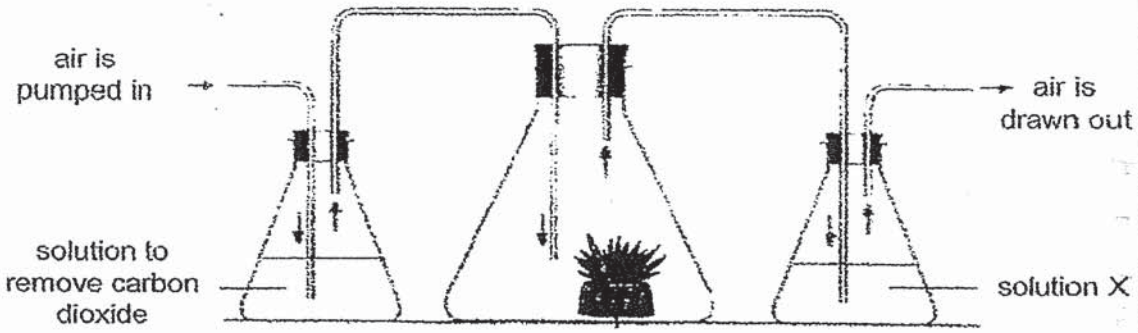
(1) nose, windpipe and lungs
(2) heart, blood and blood vessels
(3) lungs, heart and blood vessels
(4) lungs, windpipe and blood vessels

10 Melvin carried out three experiments as shown below.

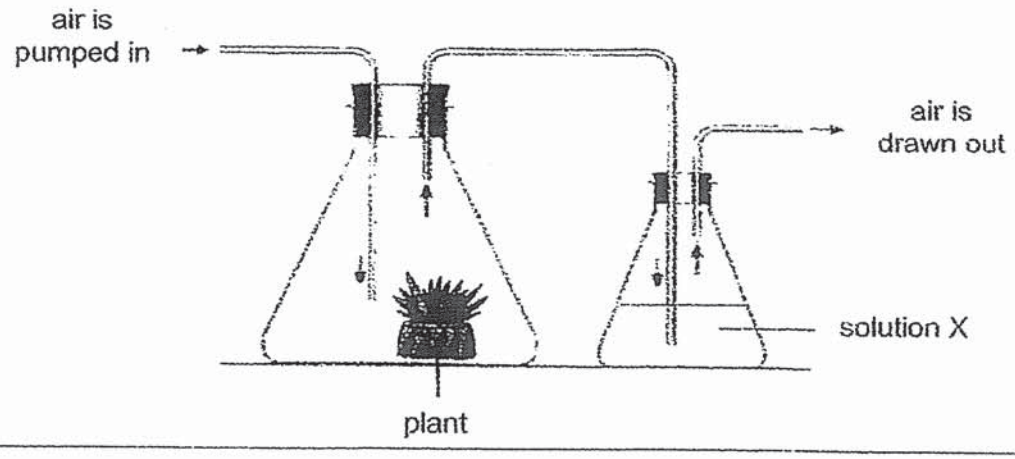
Experiment 1



Experiment 2 : Carried out in a well-lit room



Experiment 3: Carried out in a dark room



Solution X turns chalky in the presence of carbon dioxide.
Which of the following shows the correct observations at the end of the experiment?

(1)

Experiment	Solution X
1	turned chalky
2	turned chalky
3	remained clear

(2)

Experiment	Solution X
1	turned chalky
2	remained clear
3	remained clear

(3)

Experiment	Solution X
1	turned chalky
2	remained clear
3	turned chalky

(4)

Experiment	Solution X
1	remained clear
2	turned chalky
3	turned chalky

11 The diagram below shows a single-cell organism.

How is the single-cell organism different from an animal cell?

A It has a regular shape.
B It is able to make food.
C It has more than one nucleus.

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

12 Mrs Ong carried out an experiment to investigate photosynthesis as shown below. She watered the plant with 100ml of water and left the set-up in the sun for 2 hours.

What is the aim of Mrs Ong's experiment?

(1) To find out if light is required for photosynthesis.
(2) To find out if water is required for photosynthesis.
(3) To find out if oxygen is required for photosynthesis.
(4) To find out if carbon dioxide is required for photosynthesis.

13 The diagrams below show two plants, A and B. Plant A has normal green leaves whereas plant B has variegated leaves. Variegated leaves are leaves with both green and white parts.

Plant A

Plant B

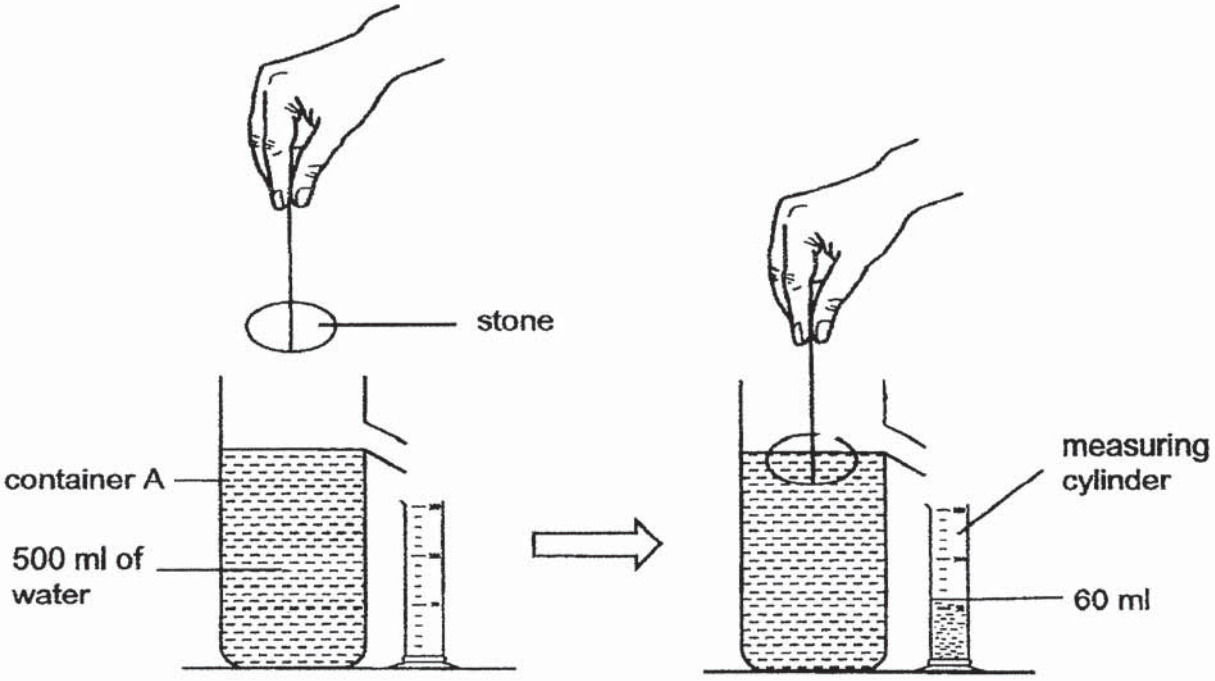
a normal green leaf from plant A

a variegated leaf from plant B

In the wild, plants with variegated leaves tend **not** to survive as well as plants with normal green leaves. What is the likely reason?

(1) Their leaves trap less light.
(2) Their leaves lose less water.
(3) Their leaves take in less oxygen.
(4) Their leaves take in less carbon dioxide.

14 An experiment was conducted as shown below. In diagram 1, container A contained 500 ml of water. In diagram 2, a stone was lowered into container A to the final position as shown below.



Beginning position of stone (Diagram 1)

Final position of stone (Diagram 2)

The amount of water in the measuring cylinder is 60 ml.

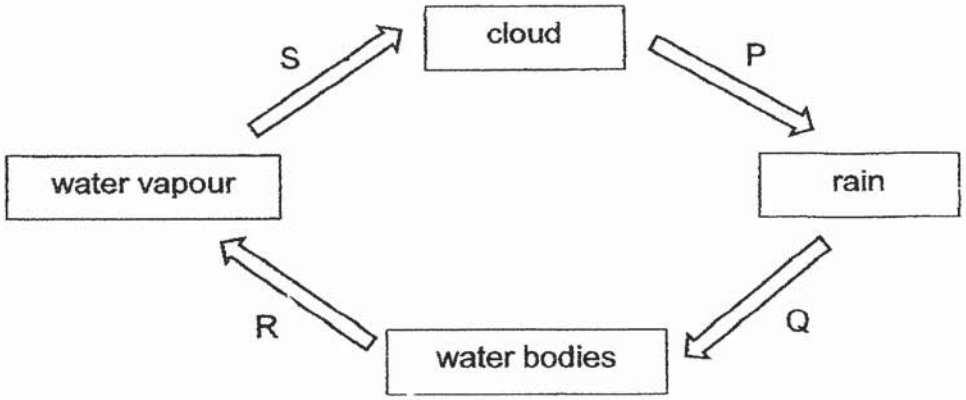
Three students made the following statements about the experiment.

	Statements
Carrie	The aim of this experiment is to find the mass of the stone.
Damien	The volume of the stone is 60 ml.
Elisha	The volume of water in container A is less than 500 ml once the stone is at the final position.

Which student(s) was / were **wrong**?

(1) Carrie only
(2) Carrie and Damien only
(3) Damien and Elisha only
(4) Carrie, Damien and Elisha

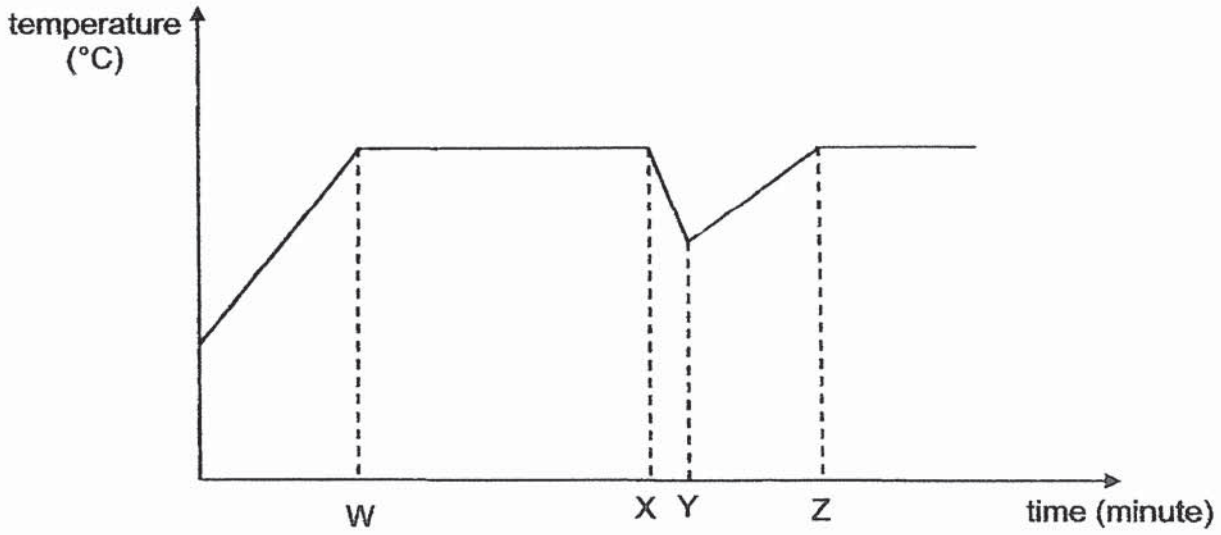
15 The diagram below shows the water cycle.



Which letters represent the processes that involve a change in the state of water?

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

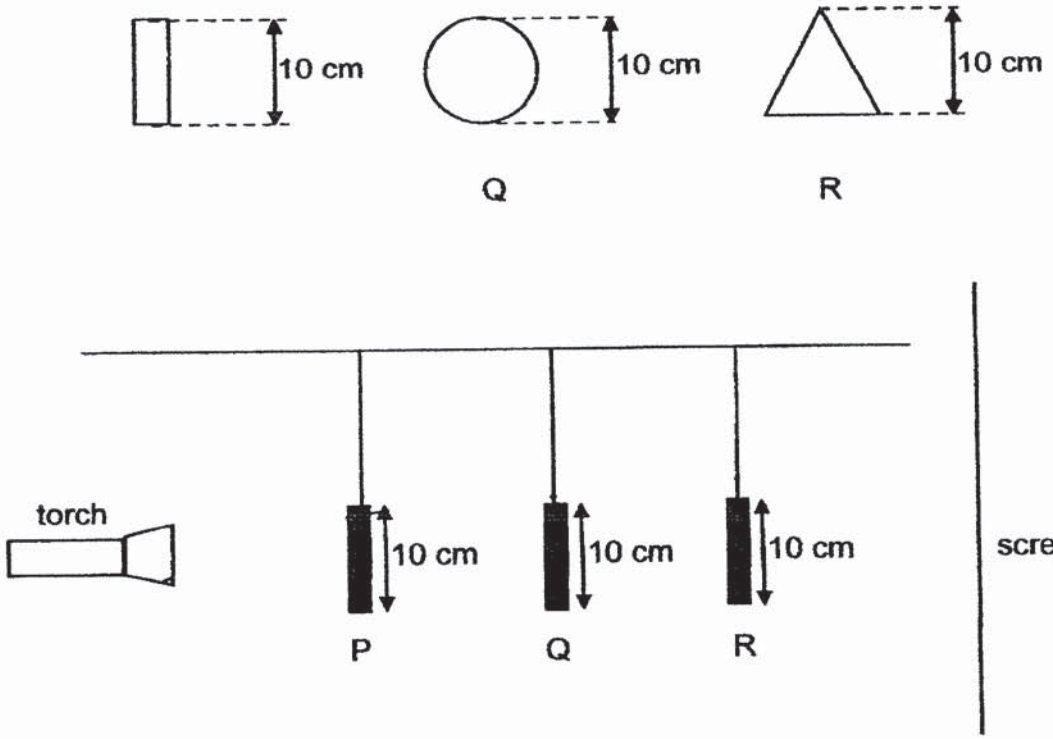
16 Ginny wanted to boil some vegetables for her dinner. She started off by heating some water in a pot to its boiling point before adding the vegetables that was taken out from the fridge. The graph below shows the change in the temperature of the water throughout the whole process.



At which point, W, X, Y or Z, did she put the vegetables into the pot?

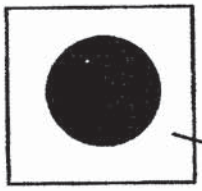
(1) W
(2) X
(3) Y
(4) Z

17 The set-up below shows three cut-outs of different shapes, hung at different distances from the torch. They are all made of the same material that does not allow light to pass through.



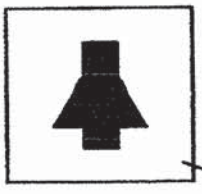
Which of the following diagrams represents what was seen on the screen when the torch was switched on?

(1)

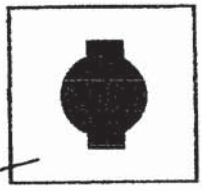


(2)

(3)



(4)

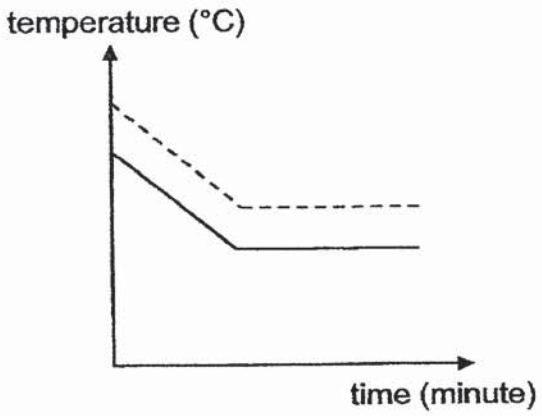


18 Henry poured some hot soup into a bowl and left it on the table as shown below.

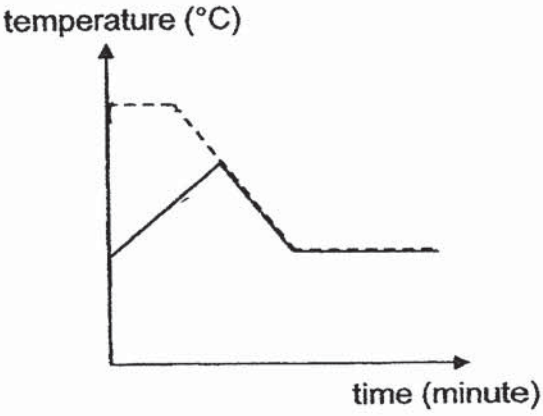
Which one of the following graphs correctly shows the changes in temperature of the bowl and the soup from the moment the soup was poured into the bowl?

Key:
——— Temperature of bowl
- - - - - - Temperature of soup

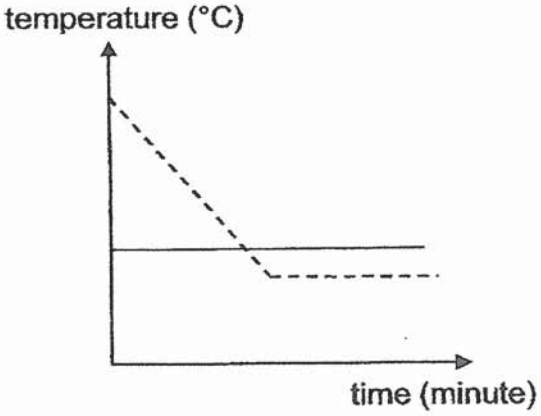
(1)



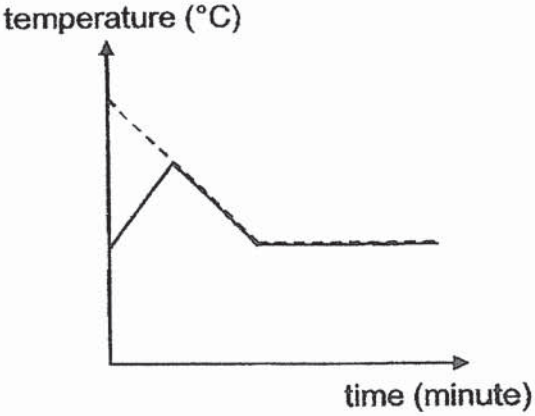
(2)



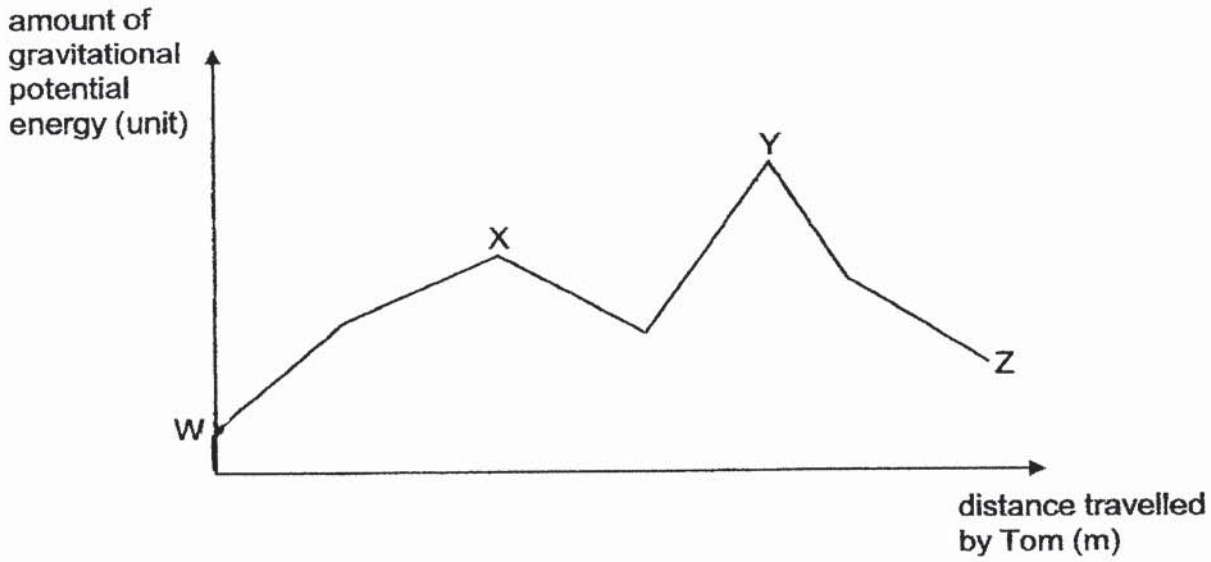
(3)



(4)



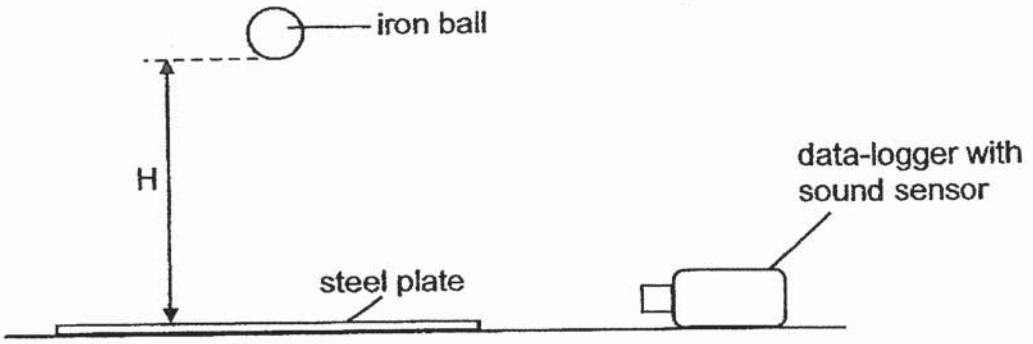
19 Tom went for a hike at Bukit Timah Hill. He walked continuously from point W to Z. He did not stop to rest. Tom plotted the amount of gravitational potential energy he possessed at the different points during the hike as shown in the graph below.



Based on the graph above, which of the following statements is true?

(1) He was at the ground level at point W.
(2) He did not possess any kinetic energy at point Y.
(3) He was at the highest point of his hike at point Y.
(4) He was climbing down a slope from point W to point X.

20 Jason wanted to find out how the mass of an iron ball and the height, H, at which it is dropped onto a steel plate affect the loudness of sound it makes. He prepared the set-up shown below and dropped iron balls of different masses from different heights.



He used a data-logger with a sound sensor attached to it and recorded the data in the table below.

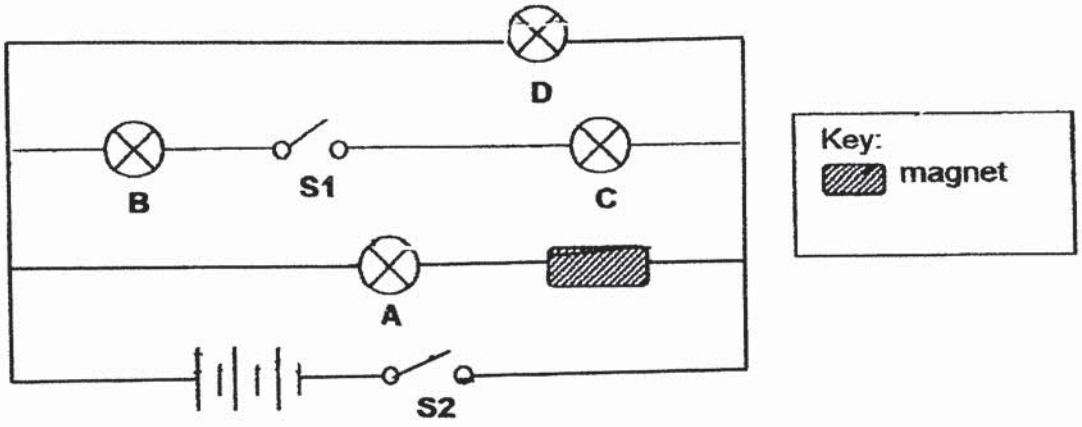
The sound sensor can only measure a maximum of 45 units of sound.

Mass of ball (kg)	Loudness of sound (units)		
	H: 10 cm	H: 20 cm	H: 30 cm
1	12	19	32
2	23	30	45
3	29	38	45

Based on Jason's experiment, which of the following statements is true?

(1) The loudness of the sound produced is definitely 45 units when a 3 kg ball is dropped at 30 cm.
(2) A ball with a smaller mass will produce a louder sound when dropped from the same height.
(3) A ball with a larger mass dropped at a greater height will have all of its potential energy converted to sound energy.
(4) A ball that is dropped from a greater height will produce a louder sound than the same ball that is dropped from a lower height.

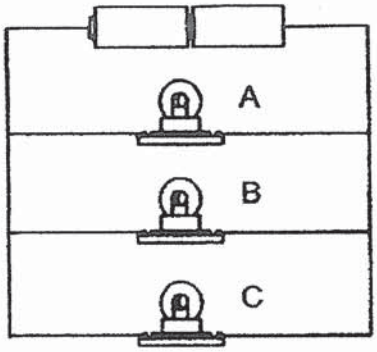
21 The diagram below shows how four bulbs, two switches, three batteries and a magnet are connected.

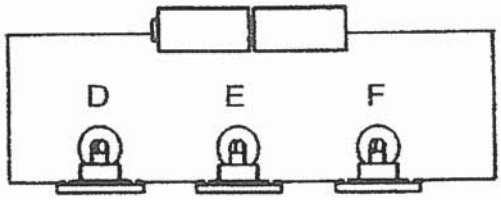


Which bulb(s) will light up when switch S2 is closed?

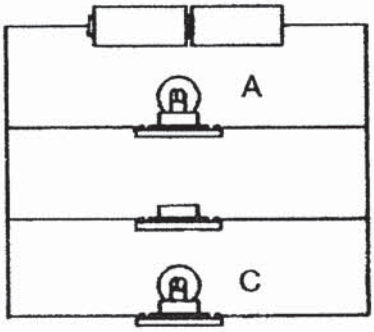
(1) D only
(2) A and D only
(3) B and C only
(4) B, C and D only

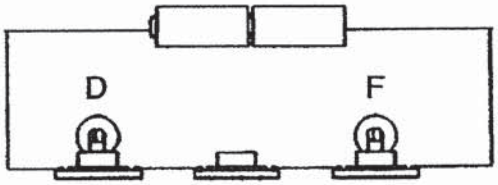
22 Gopal set up two circuits as shown below. All the bulbs lit up.





Next, Gopal removed bulbs B and E from the bulb holders as shown below.



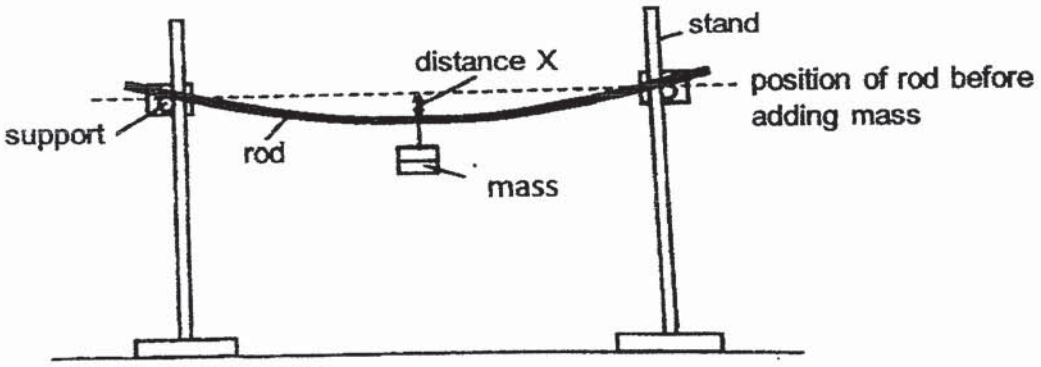


Which bulb(s) remained lit?

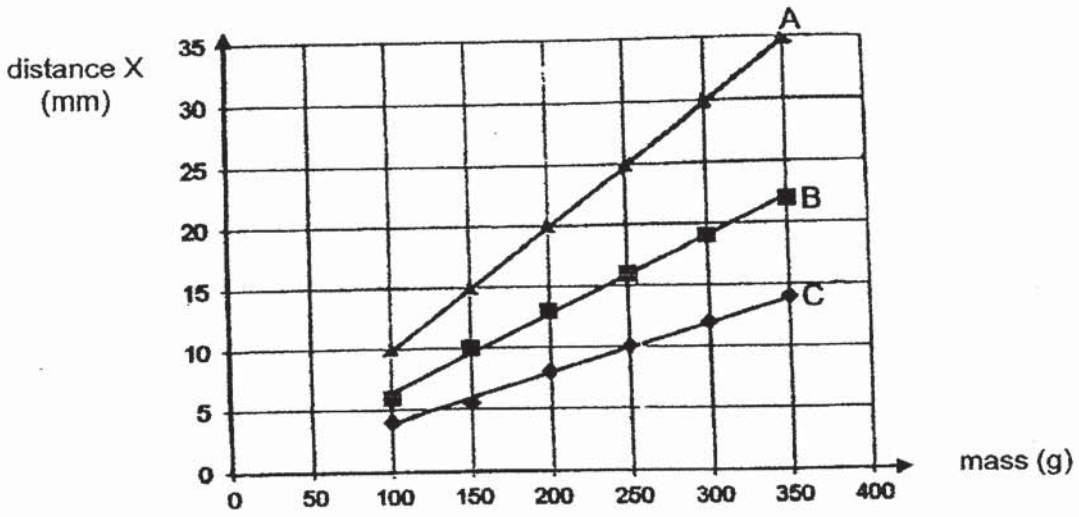
(1) A and C only
(2) D and F only
(3) A, C, D and F
(4) None of the bulbs

Answer questions 23 and 24 based on the experiment below.

Stanley carried out an experiment on rod A as shown below. He measured the distance, X, at the middle of the rod after adding each mass. He repeated the experiment using rods B and C of different materials but of the same length.



The result of Stanley's experiment is shown below.



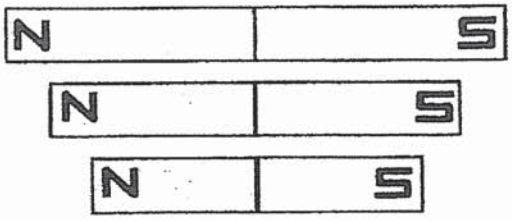
23 Stanley was trying to find out which material is the _____.

(1) heaviest
(2) thickest
(3) strongest
(4) most flexible

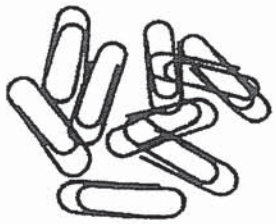
24 From the graph above, what is distance X when a 250 g mass was added to the rod A?

(1) 10 mm
(2) 15 mm
(3) 20 mm
(4) 25 mm

25 Mr Wong carried out an experiment using a few bar magnets of different length. He used the poles of the bar magnets to attract paper clips from a fixed distance and counted the number of paper clips picked up.



bar magnets



paper clips

The table below shows the results of his experiment.

Length of magnet (cm)	Number of paper clips picked up	
	North pole	South pole
10	5	5
6	4	4
4	3	3

Which of the following conclusions can be drawn based on results of the experiment above?

A The shorter the magnet, the greater the magnetic strength.
B The poles of a magnet have the greatest magnetic strength.
C The two poles of a magnet have the same magnetic strength.

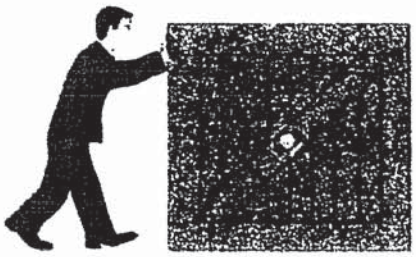
(1) C only
(2) A and B only
(3) B and C only
(4) A, B and C

26 Which of the forces can act at a distance?

A frictional force
B magnetic force
C gravitational force
D elastic spring force

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

27 The diagram shows a man pushing a heavy box,but he is unable to move it.

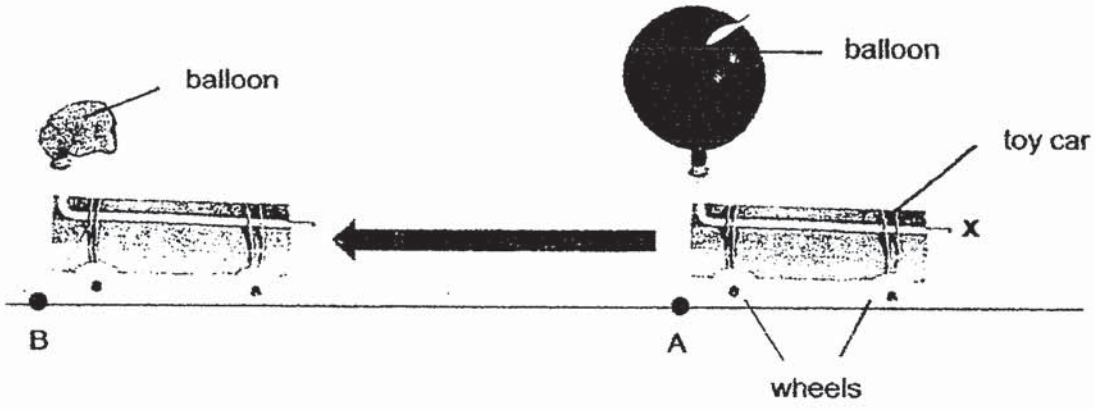


Which of the following statements is correct?

(1) There is no friction between the heavy box and the ground.
(2) The weight of the man is less than the force he exerted on the box.
(3) The force exerted by the man cannot overcome the gravitational force acting on the box.
(4) The force exerted by the man cannot overcome the frictional force between the box and the ground.

28 The diagram shows a balloon-powered toy car.

When the air in the balloon escaped from the opening at X, the toy car started to move from point A and stopped at point B as shown below.



Which of the effects of forces is **not** shown in the above experiment?

(1) stop a moving object
(2) move a stationary object
(3) change the shape of an object
(4) change the direction of a moving object

End of paper

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NAN HUA PRIMARY SCHOOL
Preliminary Examination 2020
PRIMARY 6

SCIENCE

BOOKLET B

13 Structured / Open-ended questions (44 marks)

Total Time for Booklets A and B: 1 hour 45 minutes

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the space provided.
2. Do not turn over the page until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Write your answers in this booklet.

Marks Obtained

Section B		**/ 44**

Name: _____ ( ) **Class: P 6**

Date: 26 August 2020 **Parent's Signature:** _____

This paper consists of 20 printed pages.

Section B: (44 marks)
For questions 29 to 41, write your answers in the spaces provided.
The number of marks available is shown in brackets [ ] at the end of each question or part question.

29 Study the table below. A tick (✓) indicates the presence of the characteristic.

Characteristics	Organism A	Organism B
Has six legs	✓	
Lays eggs	✓	✓
Where it lives	Young (on land) Adult (on land)	Young (in water) Adult (on land)

(a) Based on the given characteristics, which organism, A or B, is an insect? Give a reason for your answer. [1]

_____

_____

(b) Can organism A be a mosquito? Explain your answer. [1]

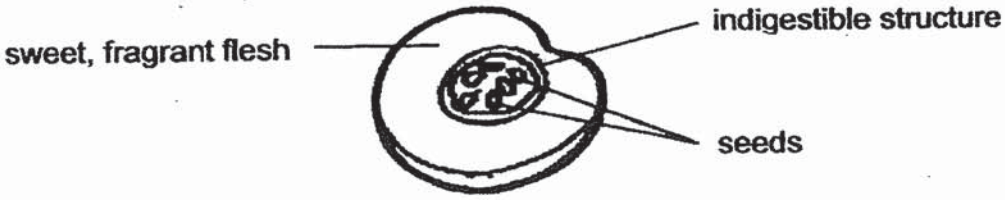
_____

_____

Score	
	2

30 The picture below shows the fruits of a plant that disperses its seeds in two stages.

The plant produces sweet, fragrant fruits that are small and bright orange in colour. Inside each fruit, a small, indigestible structure contains all its seeds as shown below.



cross-section of fruit

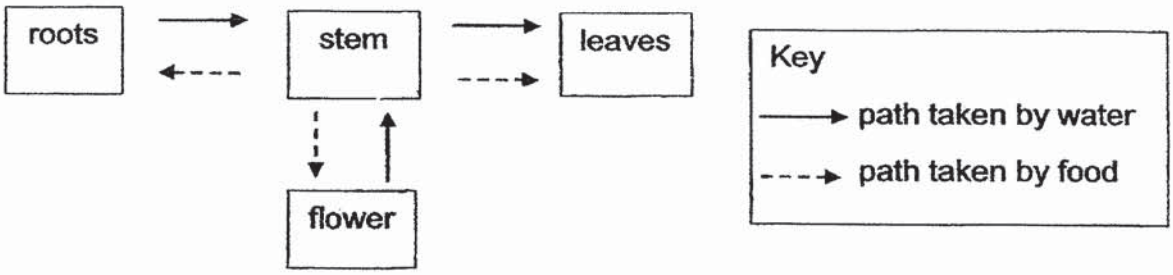
(a) Based on the information above, explain how the seeds of this fruit would be dispersed during the first stage. Explain your answer. [2]

In stage 2, the indigestible structure will dry up and burst open in an explosive action, releasing the seeds, once the conditions are right.

(b) Explain how this explosive action would be beneficial to the seedling after germination had taken place. [1]

Score 3

31 The diagram below shows the different paths taken by water and food in a plant.

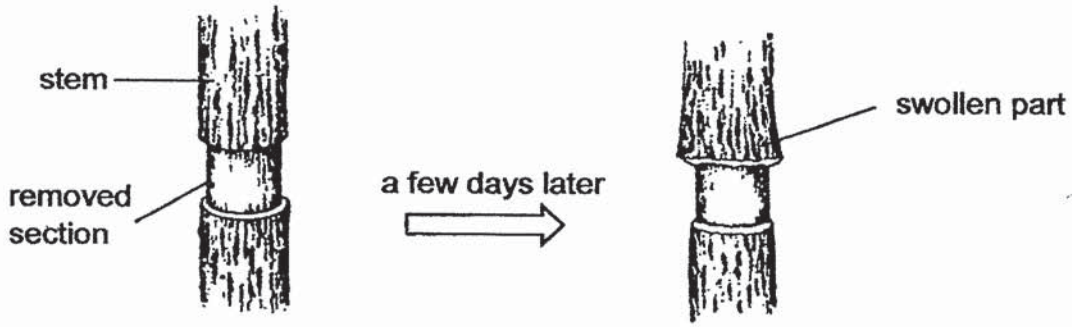


(a) Two of the arrows are drawn in the wrong direction.
Circle the two wrong arrows in the diagram. [1]

(b) Other than transporting substances, state another function of the stem of a plant. [1]

_____

The diagram below shows what happened to the stem of the plant after the outer ring of a section of the stem was removed.



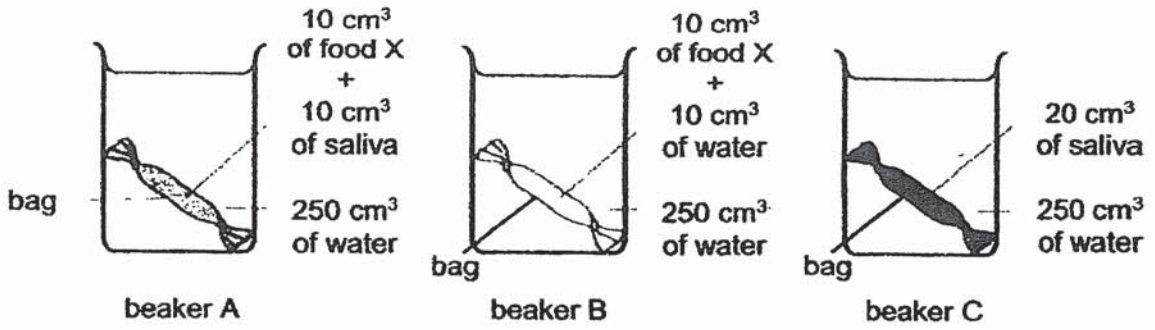
(c) Explain why the area above the section that was removed was swollen. [1]

_____

_____

Score	3

32 Mindy set up an experiment as shown below to study the digestion of food by the saliva in the mouth.



(a) What is digestion? [1]

_____

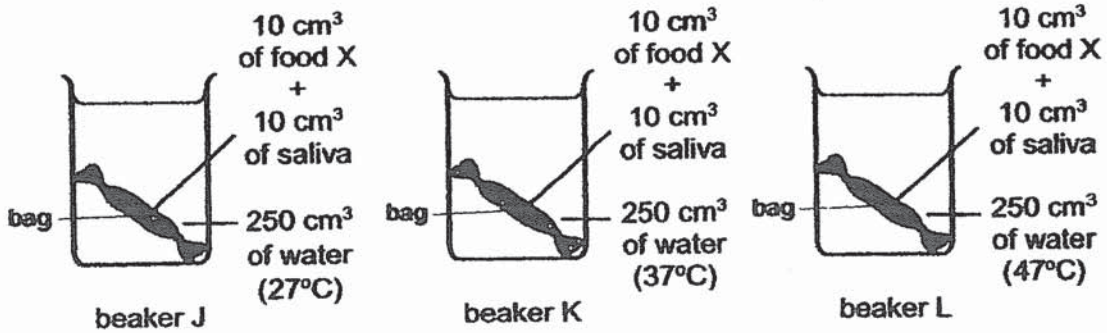
_____

(b) Which two beakers should Mindy compare if she wants to find out whether food X can be broken down by the saliva? [1]

_____

_____

(c) Mindy then carried out another experiment to find out how the rate of digestion of food is affected by the temperature of water as shown below.



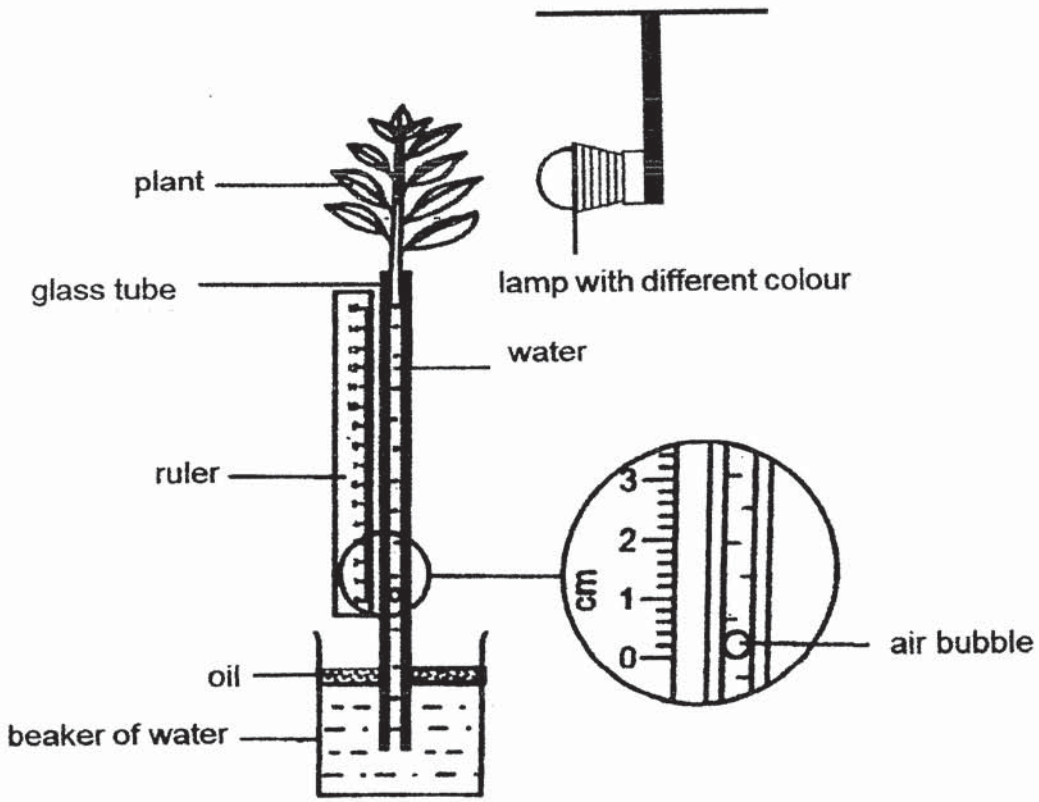
She found out that the rate of digestion of food X is the highest when she kept the temperature of water in the beaker at 37 °C, What is the reason? [1]

_____

_____

Score	3

33 The experiment below was set up in a dark room to find out how different colours of light affect the rate of photosynthesis. Four identical set-ups were used and each plant had a different coloured light shone on it. The distance moved by the air bubble in each set-up was measured after a fixed time.



The table below shows how the movement of the air bubble is affected by the colours of the light.

Colour of light	Distance moved by the air bubble (cm)
blue	16
green	5
orange	10
white	11

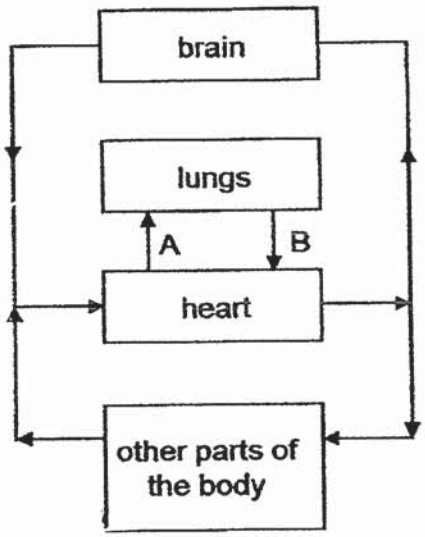
(a) The type of plant in each set-up was kept the same. How does this ensure a fair test? [1]

(b) Based on the results shown in the table, which colour of light results in the highest rate of photosynthesis? Explain your answer. [2]

(c) When no light is shone on the plant, the distance moved by the air bubble is 5 cm. Give a reason for the observation. [1]

Score	/4

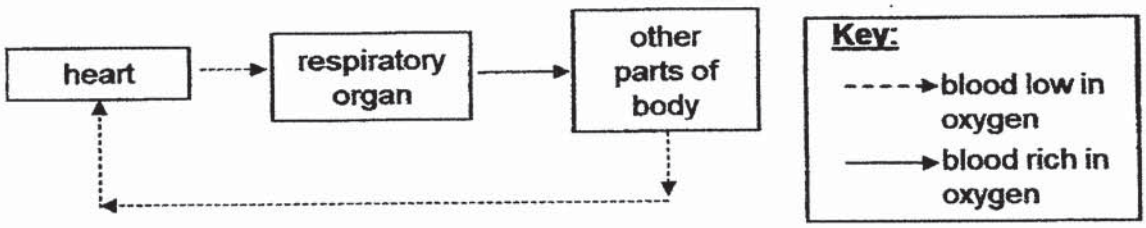
34 The diagram below shows how blood circulates around a human body.



(a) Describe the exchange of gases between the brain cells and the blood. [1]

(b) State one difference between the blood at A and the blood at B. [1]

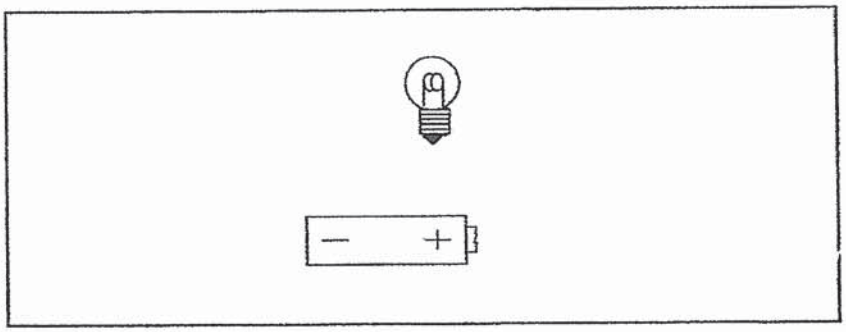
The diagram below shows how blood is circulated in animal P.



(c) Based on the diagram, state one difference between the flow of blood in the human and in animal P. [1]

Score	3

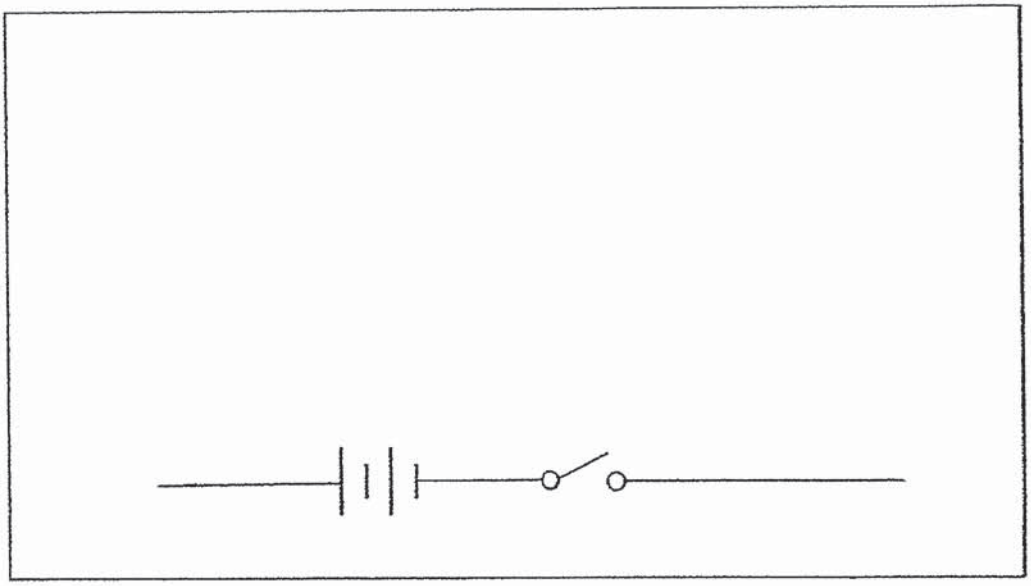
35 (a) Draw wires below to form a complete circuit to light up the bulb. [1]



(b) Design a circuit that **meet all the requirements** listed below:

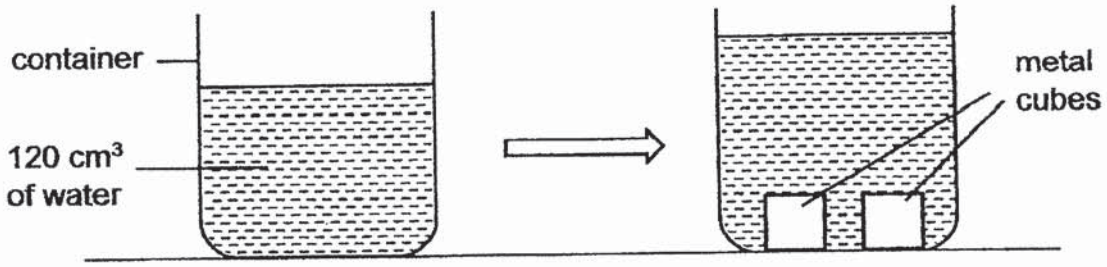
- One switch controls all the bulbs
- The other switch only controls the brighter bulb.
- Two bulbs that have the same brightness and they cannot be controlled independently. [2]

Using symbols, complete the circuit diagram in the space provided with three bulbs, one more switch and wires.



Score	
	3

36 Kayla prepared a container which has a capacity of 200 cm^3 for an experiment. She filled it with 120 cm^3 of water as shown below. She then added two metal cubes, each with a volume of 30 cm^3, to the container.

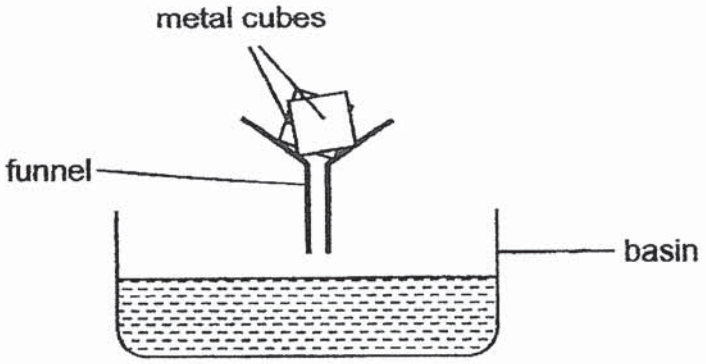


Kayla noticed that the water level has increased.

She wanted to add another metal cube of 30 cm^3 to the container without the water overflowing.

(a) Will she be able to do so? Explain your answer in terms of the properties of the cube and the water. [1]

Kayla then pour the contents of the container through a funnel into a basin as shown below. She noticed that the two metal cubes stayed above the funnel.



(b) What is the volume of the water in the basin? [1]

_____

(c) Explain, in terms of properties of matter, how the metal cubes got separated from the water. [1]

_____

_____

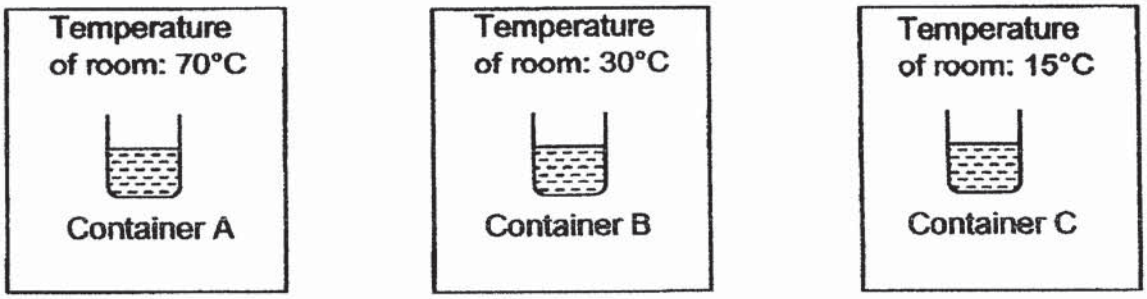
(d) When Kayla heated up one of the metal cubes, its volume increased. She concluded that the mass of the metal cube had also increased. Do you agree with her? Explain your answer. [1]

_____

_____

Score	/4

37 Nathan filled three similar containers, A, B and C, with 100 ml of water each and placed them in three different rooms as shown below. The three rooms have different temperatures.

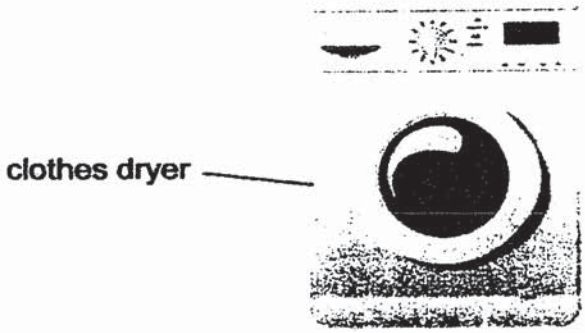


After two hours, he measured and recorded the amount of water left in each container in the table below.

Container	A	B	C
Amount of water left (ml)	26	48	83

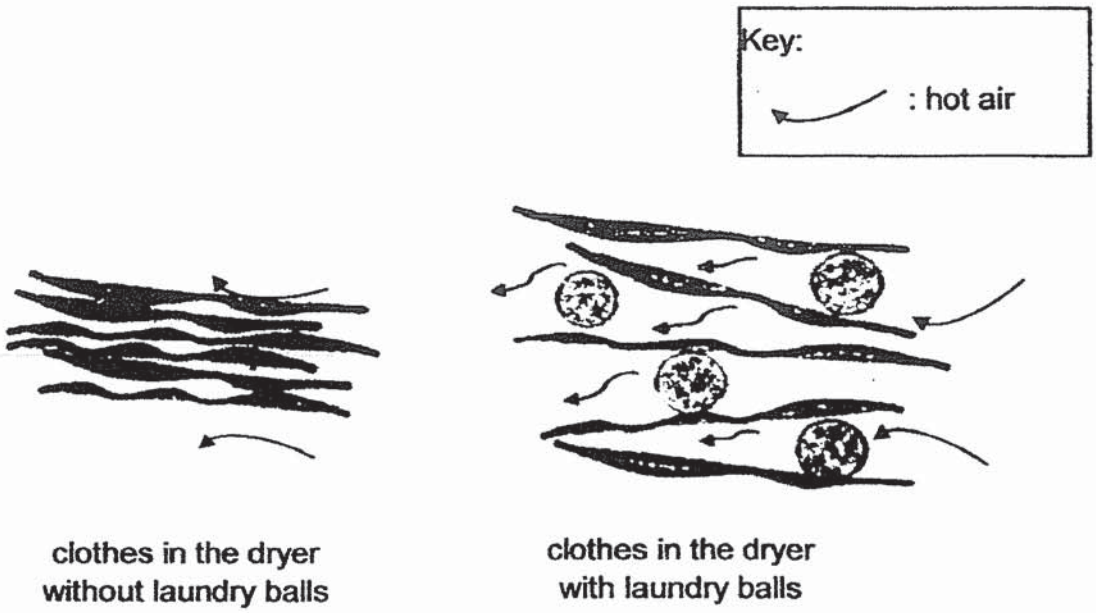
(a) Based on the table above, what is the relationship between the temperature of the room and the amount of water left in each container? [1]

A clothes dryer, as shown in the diagram below, makes use of hot air to dry clothes. The clothes are rotated inside the dryer while hot air is constantly blown at it.



(b) Explain how the hot air in the dryer helps to dry the clothes. [1]

Sometimes, laundry balls are used in the dryer to help shorten the drying time of wet clothes. The diagram below shows the drying of clothes in the dryer, with and without the use of laundry balls.



clothes in the dryer without laundry balls

clothes in the dryer with laundry balls

(c) Based on the above diagram, explain how having the laundry balls helps to shorten the drying time of the wet clothes in the clothes dryer. [2]

_____

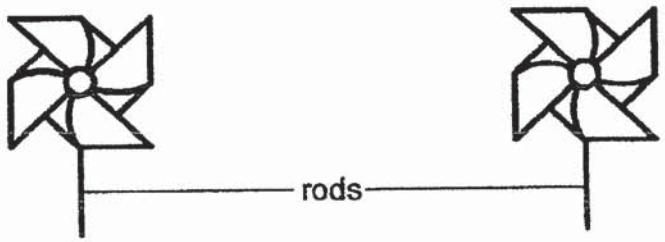
_____

_____

_____

Score	
	4

38 Paige created two similar pinwheels of different mass as shown below. Both pinwheels are attached to identical rods.



pinwheel R (mass = 10 g)

pinwheel S (mass = 20 g)

She put each pinwheel at the same distance from a fan and switched on the fan. Then, she recorded the number of times the pinwheels spin in one minute in the table below.

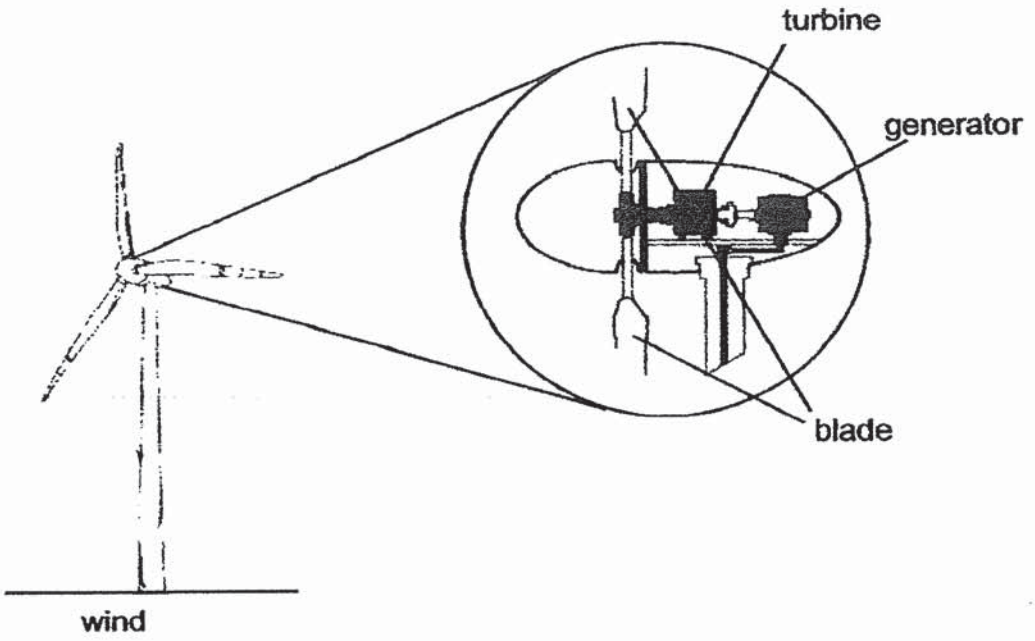
	Pinwheel R	**Pinwheel S**
Number of times it spins in one minute	65	42

Paige then created another similar pinwheel, T, with a mass of 15 g.

(a) Suggest a value for the number of times pinwheel T will spin. [1]

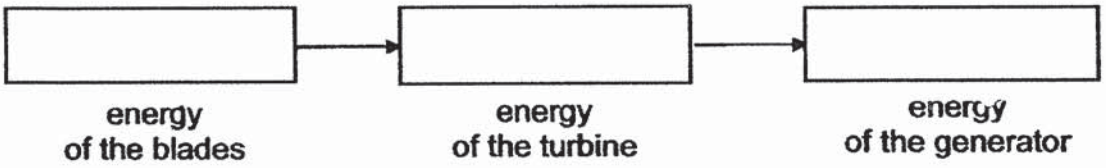
_____

Wind turbines are used in some countries to harness energy from wind.
The diagram below shows how a wind turbine generates electricity.



When there is wind, the blades will spin, causing the turbine to rotate and in turn causes the generator to generate electricity.

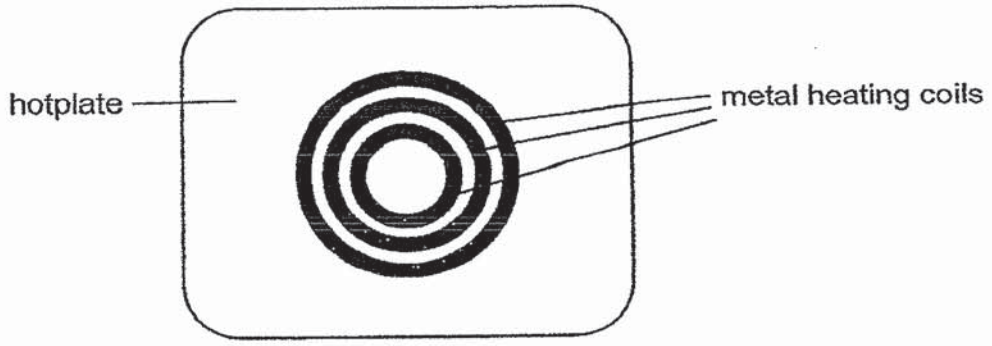
(b) State the energy conversion for the wind turbine [1]



(c) Based on Paige's experiment, in order to generate more electricity within a specific time period, is it better to use a heavier or lighter blade when designing the wind turbine? Explain your answer. [2]

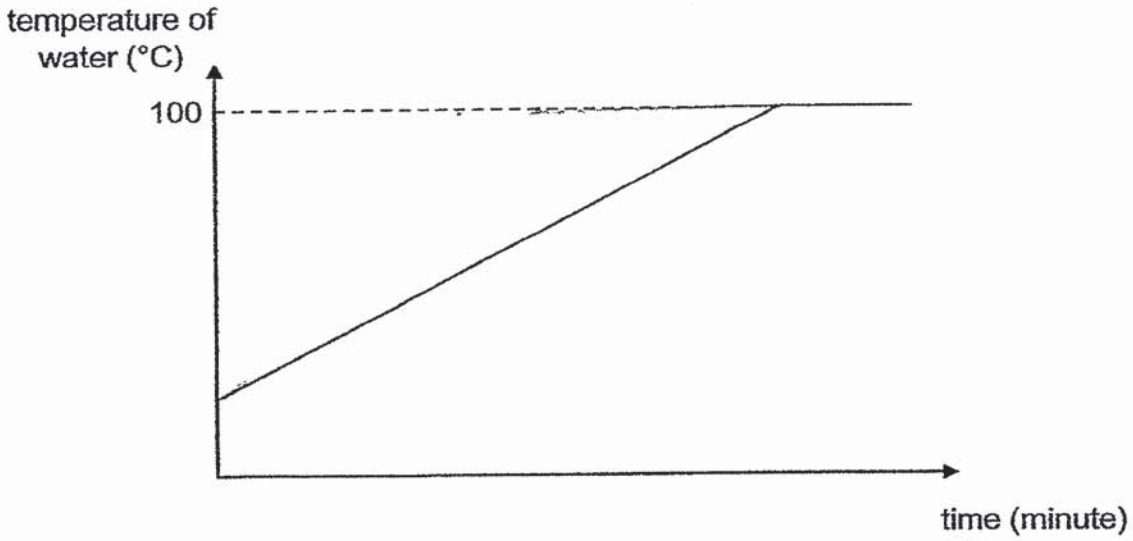
Score 4

39 Sarah bought a hotplate, A, as shown in the diagram below. Hotplate A has metal heating coils.

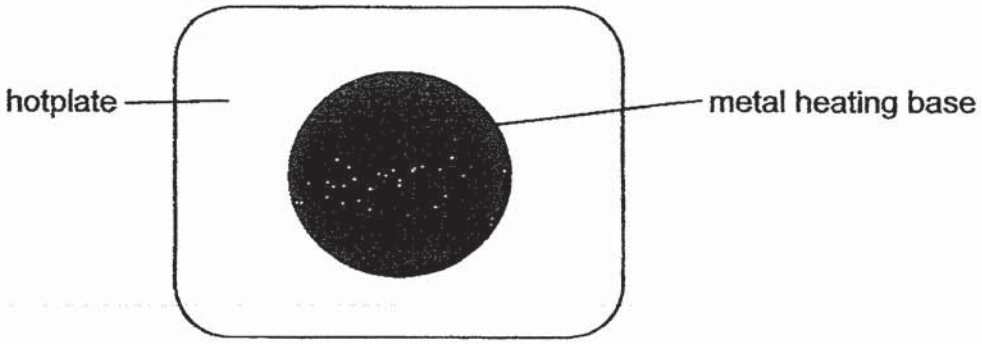


top view of hotplate A

Hotplate A is used to heat a pot of water. The change in the temperature of the water is recorded and plotted in a graph shown below.



Her sister then told her that she should have bought another hotplate, B, that has a metal heating base as shown below.



top view of hotplate B

(a) In the graph on the previous page, draw another line to represent the time taken for the same amount of water to boil should hotplate B be used. Label your line 'B'. [1]

(b) Based on the difference between the two hotplates, explain which hotplate will allow the water in the pot to boil faster. [2]

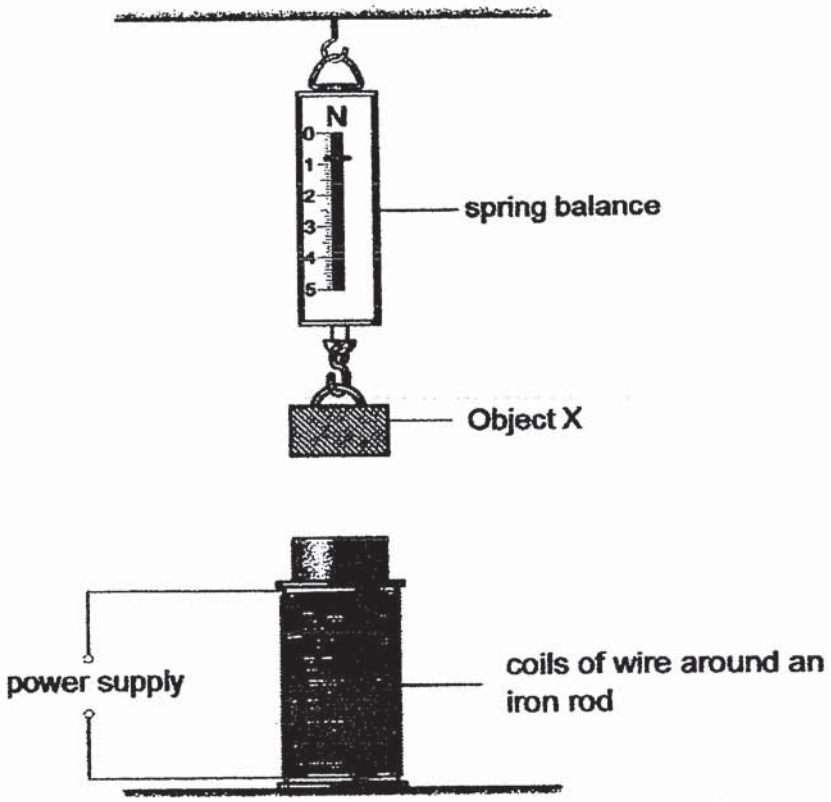
_____

_____

_____

Score	
	3

40 The set-up below was used to study the properties of three unknown objects, X, Y and Z. The iron rod turned into an electromagnet when the power supply was turned on.



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

Objects	Reading of the spring balance (unit)	
	Power supply turned off	Power supply turned on
X	0.8	0.8
Y	0.7	1.3
Z	1.2	0.9

(a) Based on the results, what can you infer about the material of object X? [1]

_____

(b) What are the main forces acting on object Y when it was hung on the spring balance and the power supply was turned on? [1]

(c) Based on the results, what can you infer about object Z? Explain your answer. [2]

Score	/4

41 The diagram below shows a ride at an amusement park.

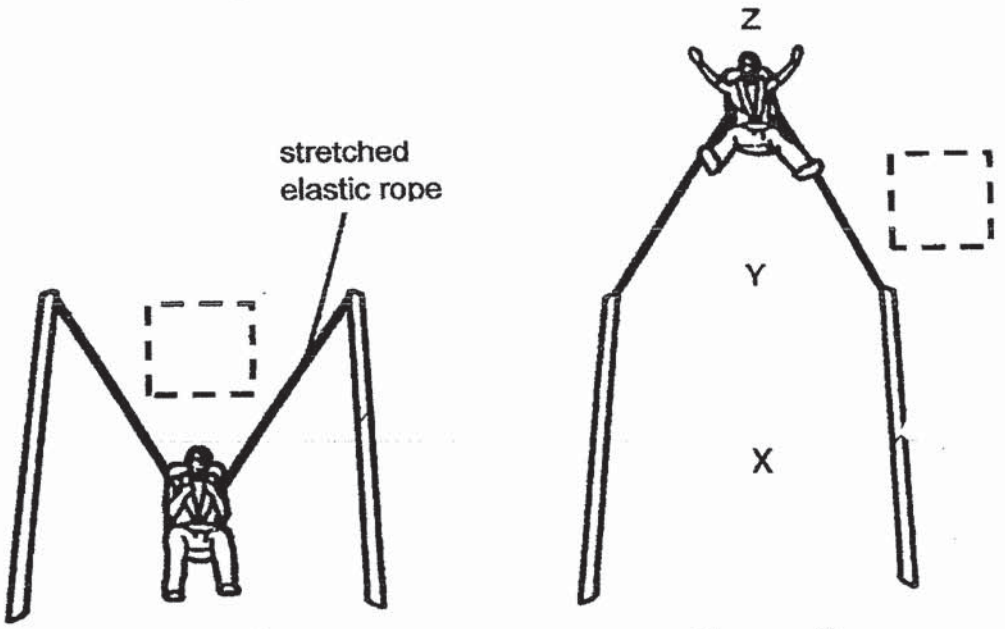


Diagram 1 Diagram 2

When Keok Ming sat on the seat, he stretched the elastic rope. When released, the stretched elastic rope pulled Keok Ming upwards until he reached point Z.

(a) In the two boxes provided in diagrams 1 and 2, draw the directions the elastic spring force of the stretched elastic rope were acting. [1]

(b) When the stretched elastic ropes were released, Keok Ming moved from X to Z. Identify the force that caused him to move more slowly from Y to Z than from X to Y. Explain your answer. [2]

_____

_____

_____

_____

(c) State the main form(s) of energy that Keok Ming possessed at position Z. [1]

_____

End of paper

Score	
	4