**MARIS STELLA HIGH SCHOOL (PRIMARY)**

**SA1 EXAMINATION**

**SCIENCE**

**16 MAY 2019**

**BOOKLET A**

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NAME: _____ (  )

CLASS: Primary 6 (  )

28 questions

56 marks

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

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FOLLOW ALL INSTRUCTIONS CAREFULLY.

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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). Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet (OAS).

(28 x 2 marks)

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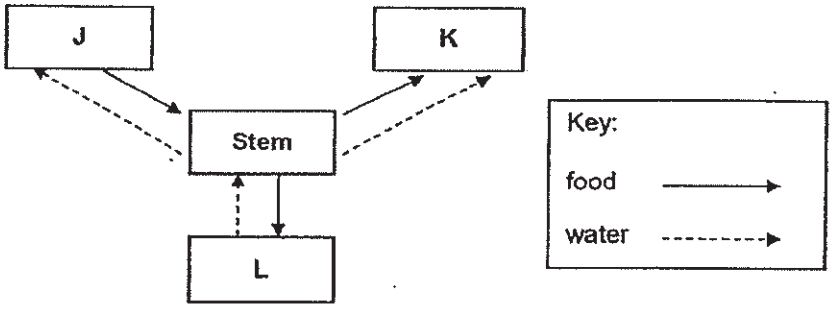
1 The table below shows the mass of organism X in January and February.

| Month | Mass (g) |
|---|---|
| January | 600 |
| February | 1200 |

Which of the following is the most likely reason for the difference in mass observed?

(1) The cells in X died.
(2) The cells in X became bigger.
(3) The number of cells of X decreased.
(4) The cells in X went through cell division.

2 The diagram below shows how food and water are transported in plants. J, K and L represent different plant parts.




Which of the following plant parts best represent J, K and L?

| | J | K | L |
|---|---|---|---|
| (1) | fruits | leaves | roots |
| (2) | leaves | roots | fruits |
| (3) | roots | fruits | leaves |
| (4) | leaves | fruits | roots |

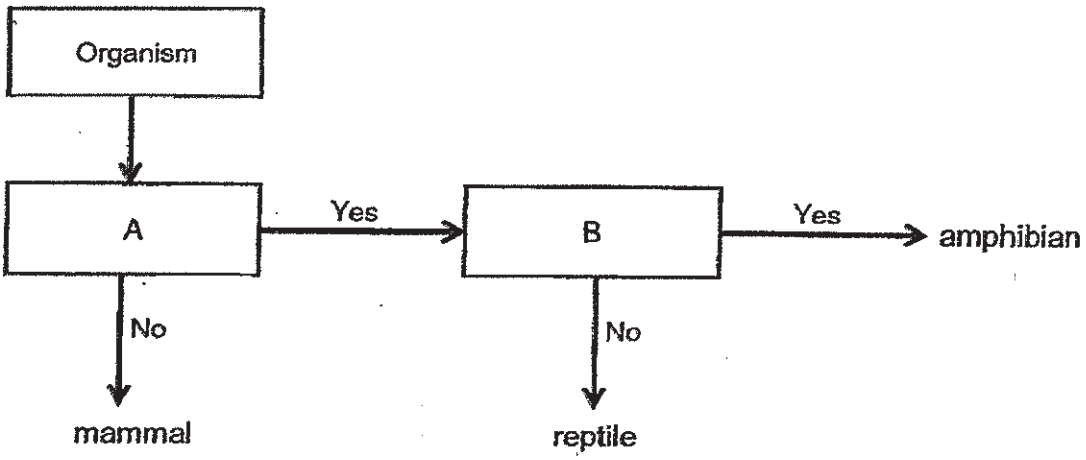


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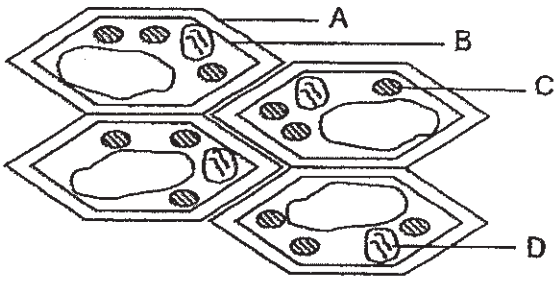
3 Study the flow chart below.




Which of the following shows the characteristics represented by A and B?

| | A | B |
|---|---|---|
| (1) | has lungs | has four legs |
| (2) | has four legs | lays eggs |
| (3) | has lungs | has dry scaly skin |
| (4) | lays eggs | has smooth moist skin |

4 Study the cells below.




Which of the following cell parts are correctly matched to the descriptions?

| | Gives plant cells its shape | Contains genetic information |
|---|---|---|
| (1) | A | C |
| (2) | A | D |
| (3) | B | C |
| (4) | B | D |

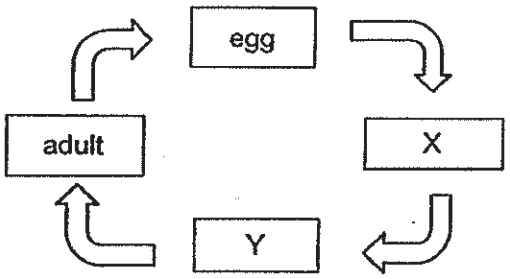


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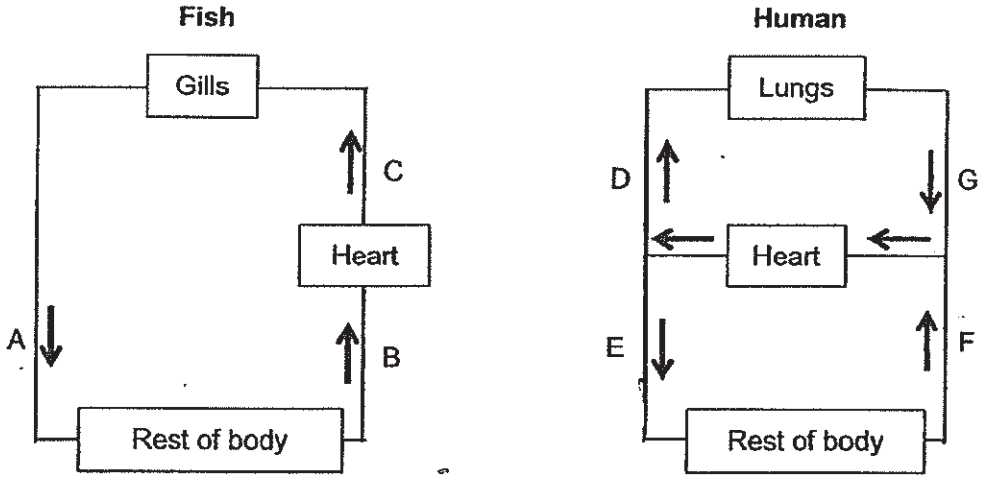
5 The diagram shows the stages in the life cycle of a mosquito.




Which of the following correctly describes the mosquito at stages X and Y?

| | X | Y |
|---|---|---|
| (1) | unable to fly | able to fly |
| (2) | feeds a lot | does not feed at all |
| (3) | lives on land | lives on land |
| (4) | does not look like adult | looks like adult |

6 The diagrams below show the circulatory systems of a fish and a human.




Which of the following pairs of blood vessels carry blood poor in oxygen?

(1) A and F
(2) A and E
(3) B and G
(4) C and D

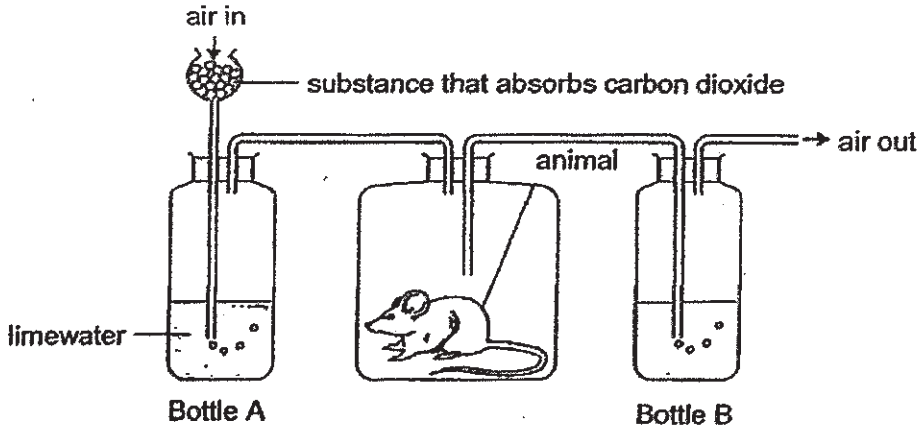


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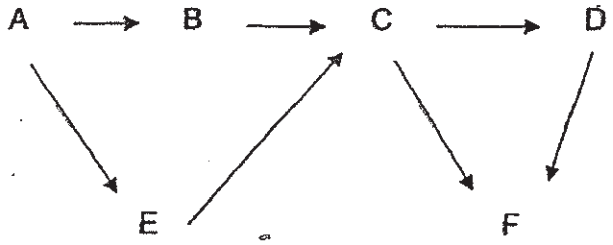
7 Cynthia carried out an experiment as shown below to investigate the difference between inhaled and exhaled air. Limewater turns chalky when carbon dioxide is present.




Which of the following shows the correct observations?

| | Limewater in Bottle A | Limewater in Bottle B |
|---|---|---|
| (1) | clear | clear |
| (2) | clear | chalky |
| (3) | chalky | clear |
| (4) | chalky | chalky |

8 The diagram below shows a food web.




Which organisms are both a prey and a predator?

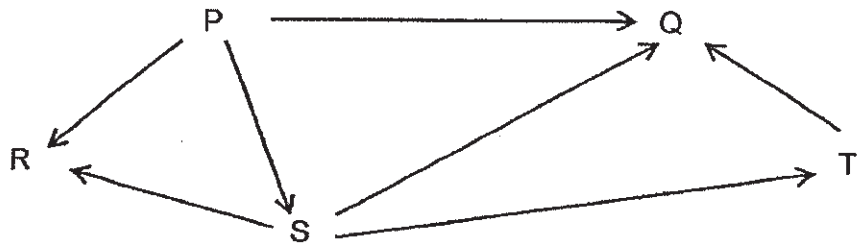
(1) B and E only
(2) C and D only
(3) C, D and F only
(4) B, C, D and E only



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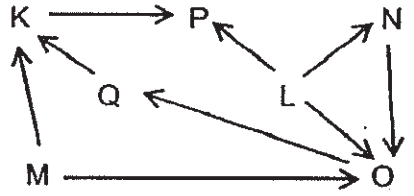
9 The diagram below shows part of a food web in a certain habitat.




Based on the information provided, what could most likely lead to an increase in the population size of S?

(1) Increase in the number of T
(2) Increase in the number of Q
(3) Decrease in the number of R
(4) Decrease in the number of P

10 The food web below shows the food relationships among various organisms in a particular community.




Based on the food web above, which one of the following statements is correct?

(1) O is a predator.
(2) L is a consumer.
(3) P eats meat only..
(4) M is the only producer

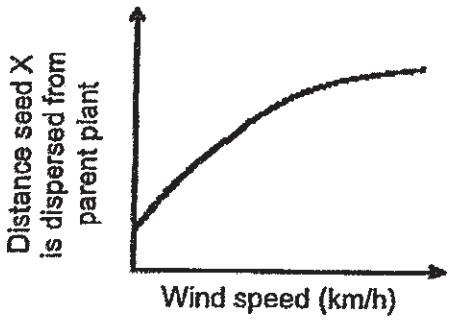


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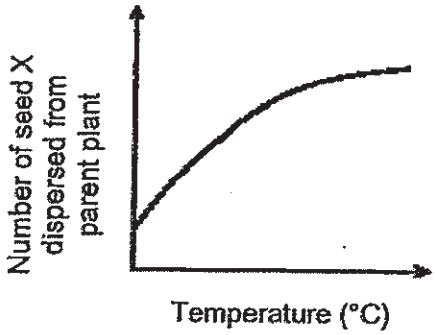
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11 Graphs A and B show how the dispersal of seed X is affected by wind and temperature.




**Graph A**




**Graph B**

Which conclusions about seed X can be drawn from graphs A and B?

A The stronger the wind, the more seeds are dispersed.
B The stronger the wind, the further the seeds are dispersed.
C The higher the surrounding temperature, the more seeds dispersed.
D The higher the surrounding temperature, the further the seeds are dispersed.

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

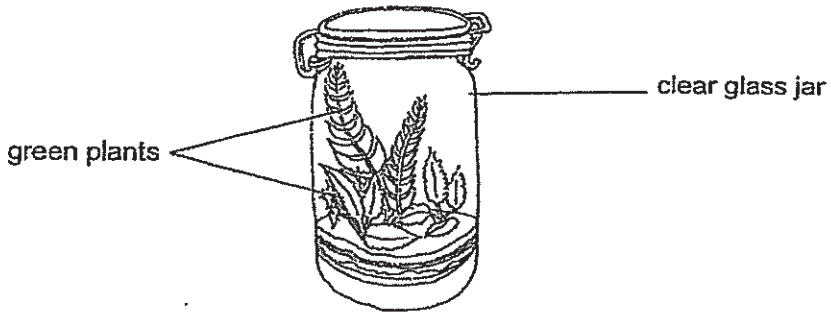


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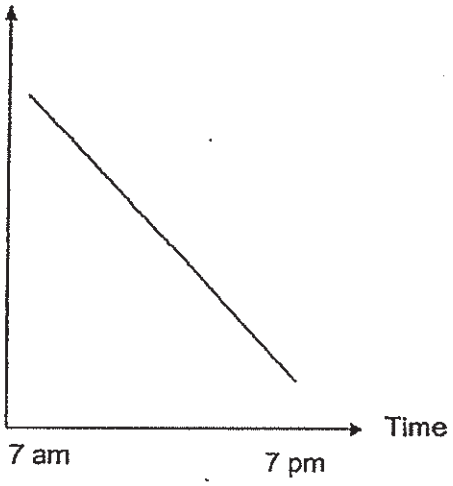
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12 The terrarium below is left near an open window.

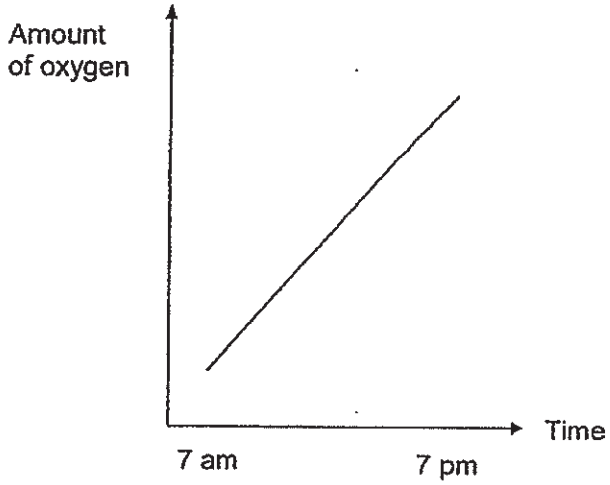



Which one of the following graphs shows the amount of oxygen found in the terrarium between 7 am and 7 pm?

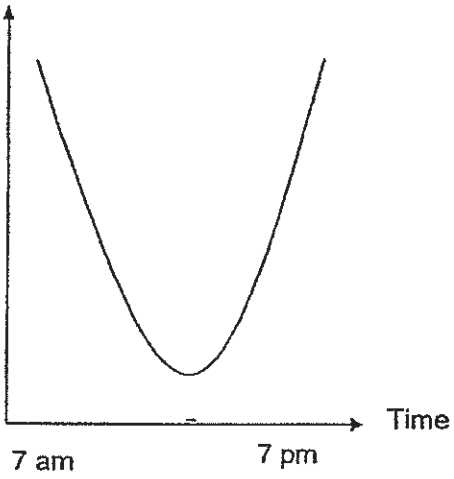
(1)



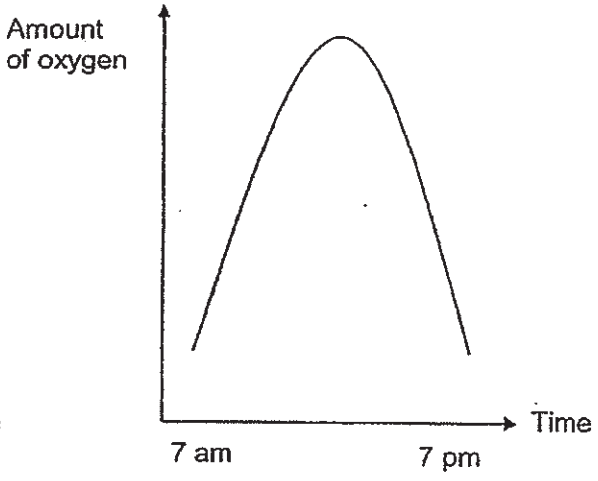

(2)




(3)




(4)



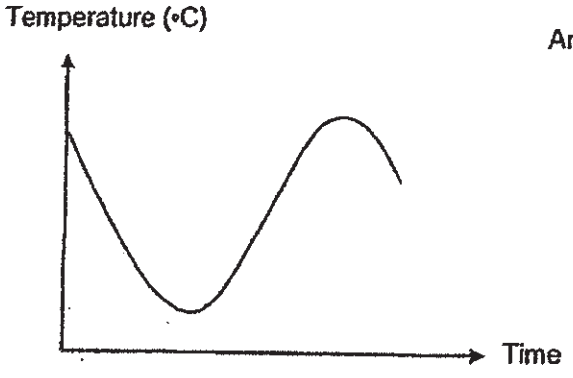



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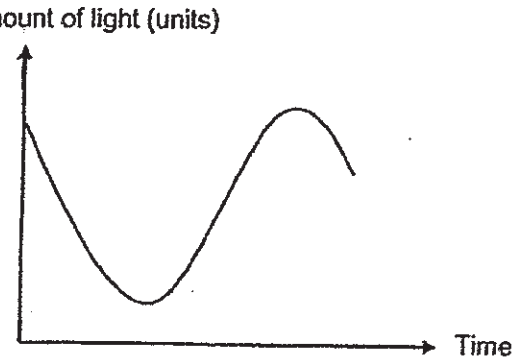
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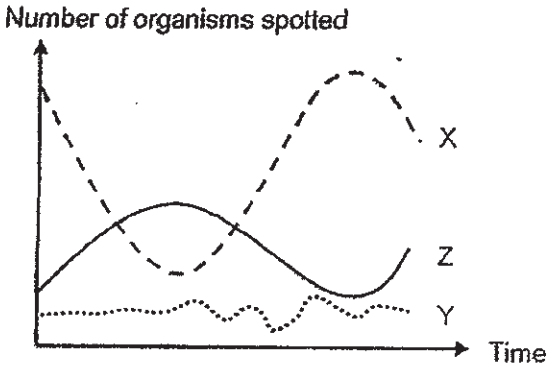
13 Graphs 1 and 2 show the temperature and amount of light in a certain area over a period of time. Graph 3 shows the number of three different organisms, X, Y and Z, spotted in the same period.




Graph 1




Graph 2




Graph 3

Which of the following can be concluded from the graphs?

A Organism X likes hot and bright places.

B Organism Y likes cool and dark places.

C The change in temperature and amount of light has the least effect on organism Z.

(1) A only

(2) C only

(3) A and B only

(4) B and C only



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14 Tree A grows at the bottom of a hill.




After some time, some seedlings of A were found growing on top of the hill.

Which of the following are possible methods of seed dispersal for tree A?

A wind
B water
C animal
D splitting

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

15 When a force is applied to a stationary object, several effects are possible.

Which of the following effects is **not** possible?

(1) The object rotates.
(2) The object does not move.
(3) The object changes shape.
(4) The object decreases in mass.

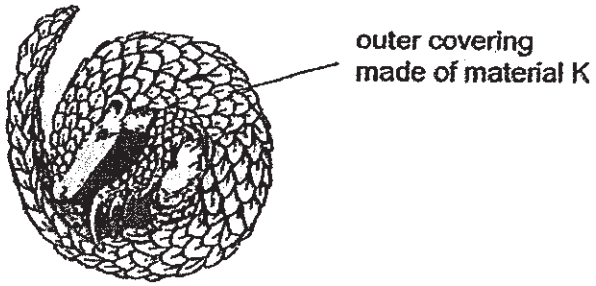


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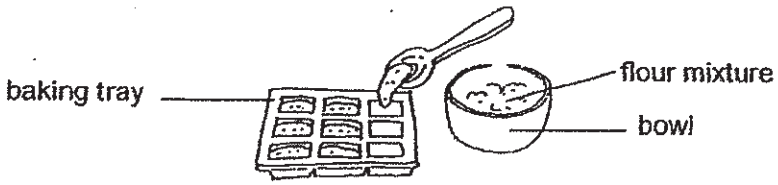
16 Animal P is a mammal that curls up into a ball when faced with predators. By doing this, predators cannot bite through it. Its outer covering is made of material K.




Which property of material K allows the outer covering to perform the functions described?

(1) strength
(2) waterproof
(3) transparency
(4) ability to float

17 Carrie transferred the flour mixture from a bowl into a baking tray as shown below.




Which of the following explains why the flour mixture can fill the spaces in the baking tray?

(1) The flour mixture has definite shape.
(2) The flour mixture has definite volume
(3) The flour mixture has no definite shape.
(4) The flour mixture has no definite volume.

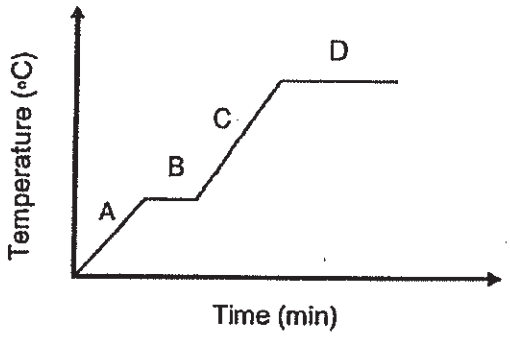


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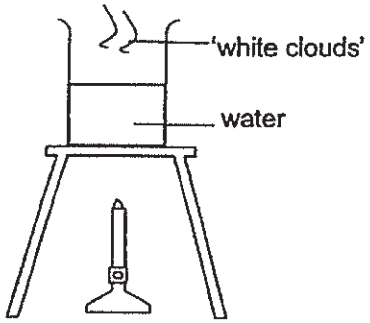
18 The graph below shows the changes in temperature of a beaker of water over time. A, B, C and D are different parts of the graph.




Which of the following best explains the change in temperature of water at part C of the graph?

(1) Water in the beaker was boiling.
(2) Water gained heat from a heat source.
(3) The beaker of water was placed into a freezer.
(4) Water in the beaker lost heat to the surrounding.

19 Jane boiled a beaker of water. Two processes, A and B, took place. Process A took place in the water and process B resulted in the formation of the 'white clouds'.




Which of the following is correct?

| | Process A | Process B |
|---|---|---|
| (1) | evaporation | condensation |
| (2) | boiling | evaporation |
| (3) | condensation | boiling |
| (4) | boiling | condensation |

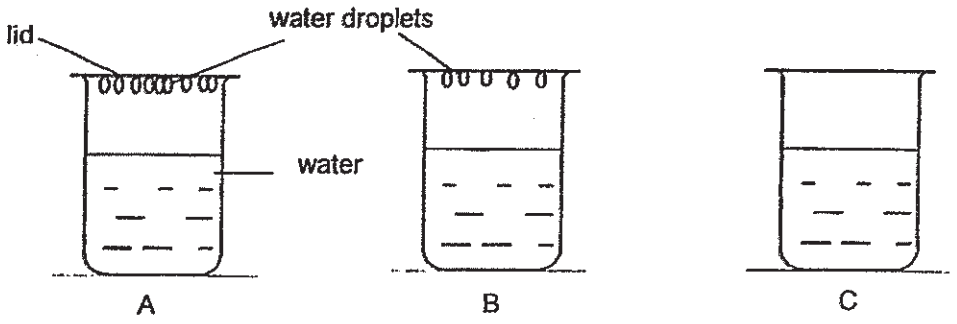


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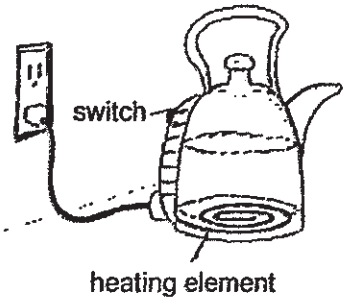
20 Three identical beakers were filled with water of different temperatures and covered with identical lids. The diagrams below show the observations made on the lids of the three beakers 20 minutes after they were placed in a room at 30°C.




Which of the following correctly shows the temperature of the water in each beaker at the start?

| | A | B | C |
|---|---|---|---|
| (1) | 90°C | 10°C | 30°C |
| (2) | 30°C | 90°C | 10°C |
| (3) | 90°C | 50°C | 30°C |
| (4) | 30°C | 40°C | 90°C |

21 The diagram below shows a kettle with its heating element.




Which of the following shows the energy conversion that will take place when the kettle is switched on?

(1) electrical energy → heat energy

(2) elastic potential energy → heat energy

(3) heat energy → electrical energy → heat energy

(4) chemical potential energy → electrical energy → heat energy

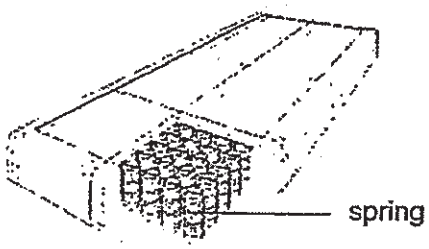


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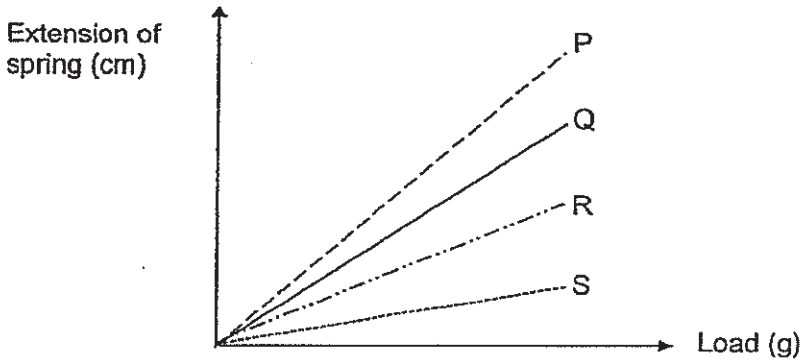
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22 The inside of spring mattresses are filled with springs to provide support.




spring mattress

A spring mattress manufacturer wants to make a firm spring mattress that can support heavy persons. The graph below shows the extension of four different springs, P, Q, R and S, when loads were hung on them. The springs used are similar except for the material of the spring.




Which spring should the manufacturer choose to make the mattress if he wants the firmest possible mattress?

(1) P
(2) Q
(3) R
(4) S

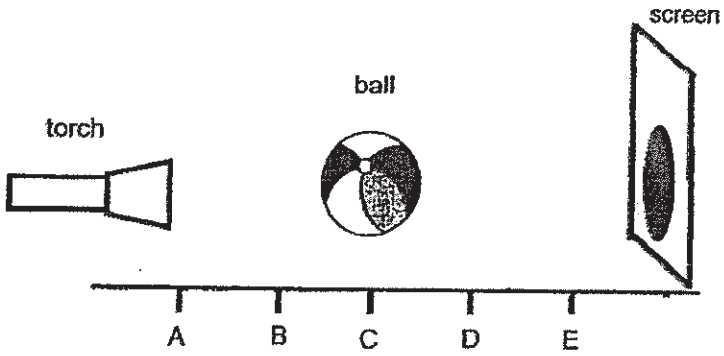


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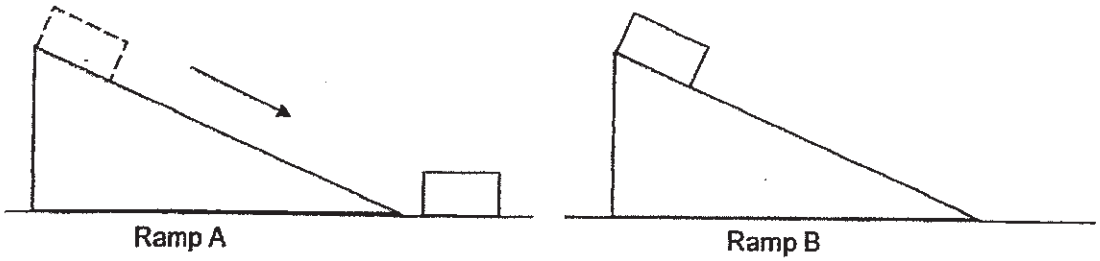
23 A ball is placed at position C. When a torch is shone from position A, a shadow is formed on the screen.




Without shifting the positions of the torch and screen, which position should the ball be placed to form the biggest shadow on the screen?

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

24 Ramps A and B are of the same size. Two identical blocks are placed on the ramps and released from the same height. The block on ramp A slid down but the block on ramp B did not move.




Which of the following statements is/are likely explanation(s) for the observations?

A Ramp A has a smoother surface than ramp B.
B Frictional force is present between the block and ramp B but not present on ramp A.
C The block on ramp A had more gravitational force acting on it than the block on ramp B.

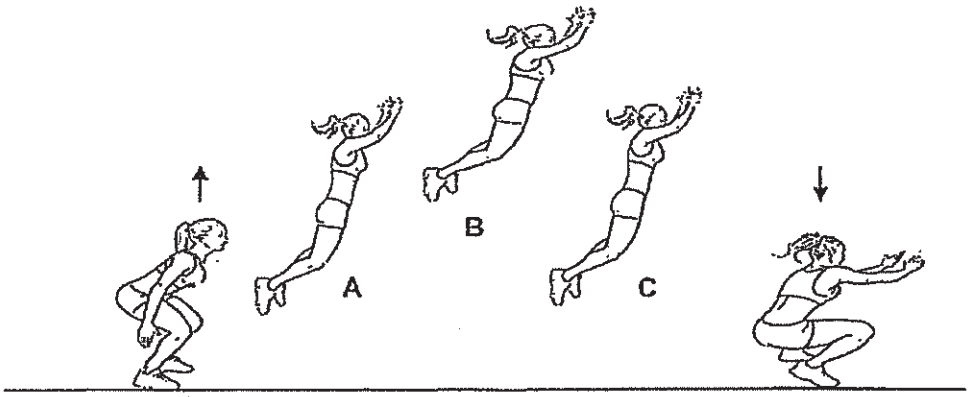
(1) A only
(2) A and C only
(3) B and C only
(4) A, B and C



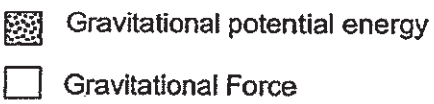
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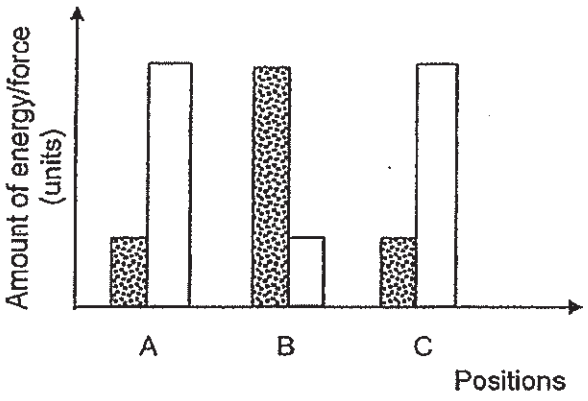
25 The diagram below shows a girl performing standing broad jump.



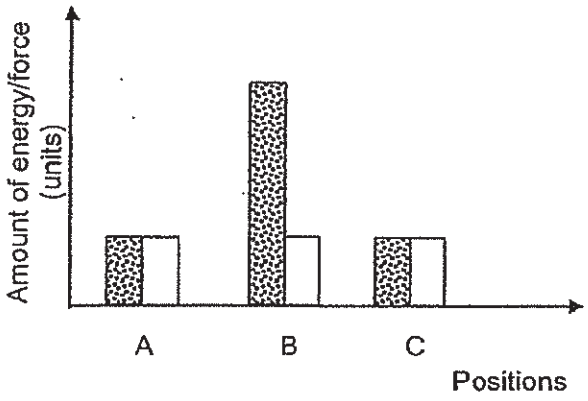

Which of the following shows the amount of gravitational potential energy and gravitational force of the girl at A, B and C?



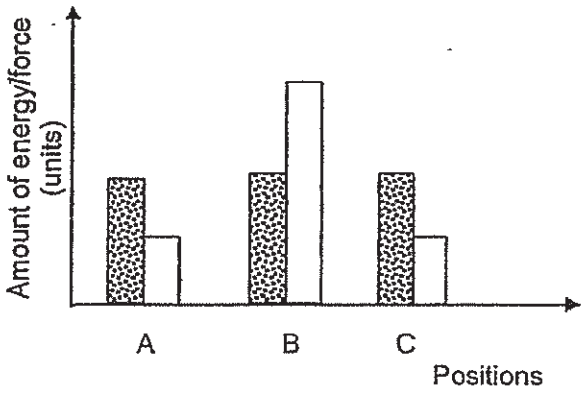

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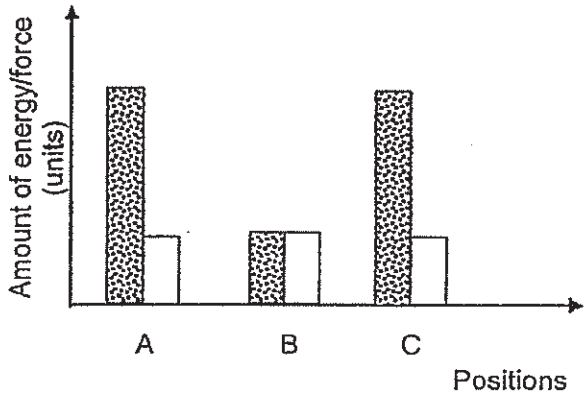

(2)




(3)




(4)



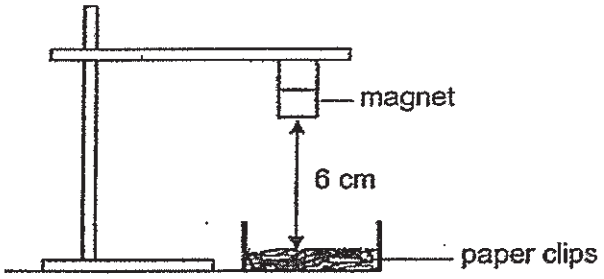



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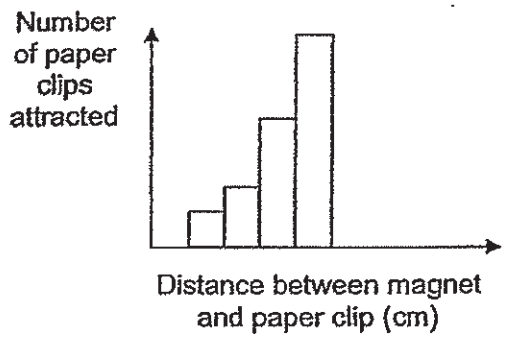
26 Kevin used a strong bar magnet to conduct the following experiment. He placed the magnet 6 cm away from 50 identical paper clips and counted the number of paper clips attracted to the magnet.



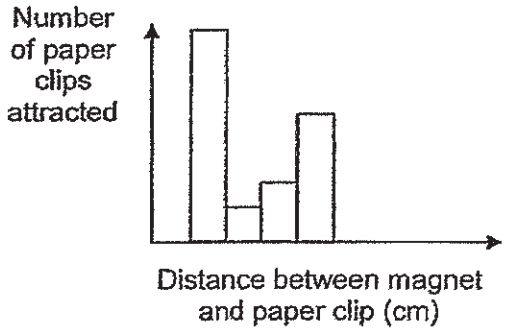

He repeated the experiment by increasing the distance between the magnet and paper clips.

Which of the following graphs is most likely the results of Kevin's experiment?

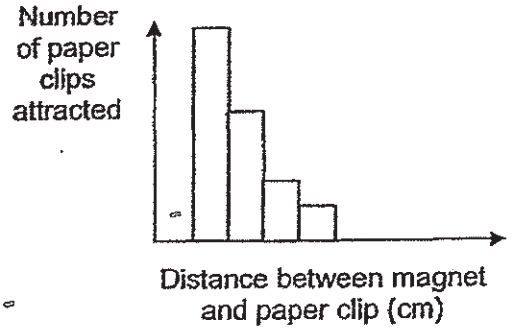
(1)



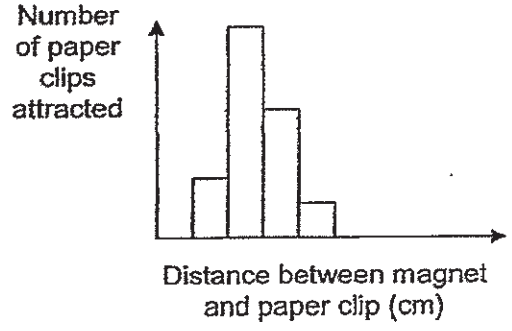

(2)




(3)




(4)



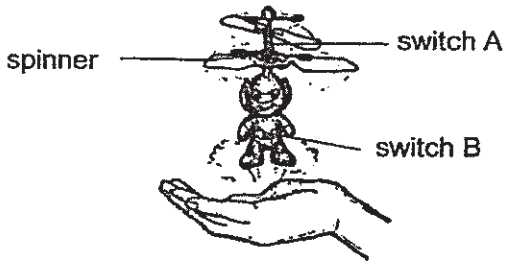



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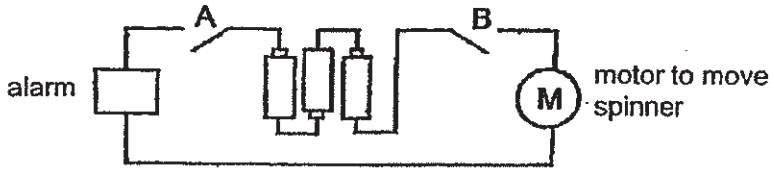
27 Luke has a toy that works on batteries.



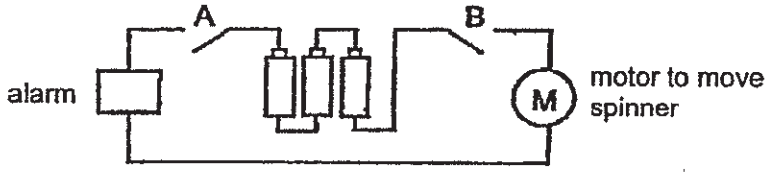

His observations of the toy when different switches are switched on are shown below.

| Switched on | Observation |
|---|---|
| Both A and B | Spinner turned.<br>Toy alarm made a sound. |
| B only | Spinner turned.<br>Toy alarm did not make a sound. |
| A only | Spinner did not turn.<br>Toy alarm made a sound. |

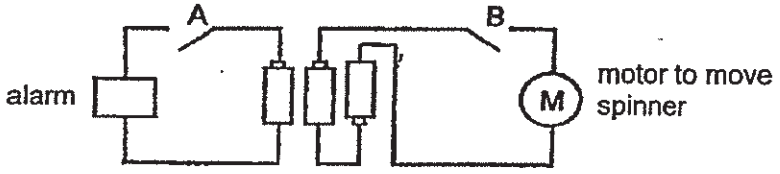
(1)



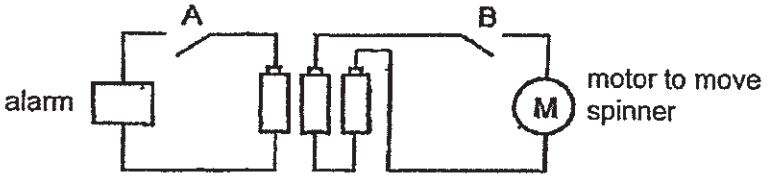

(2)




(3)




(4)



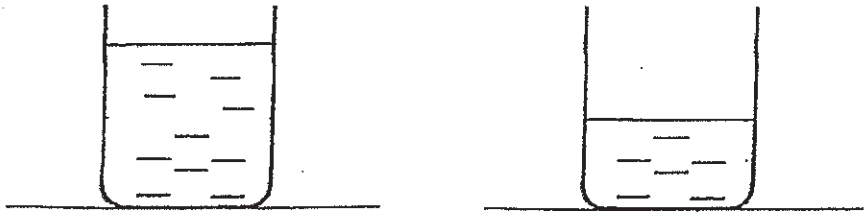



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28 Jane poured 450 $cm^3$ of boiling water into container A and 200 $cm^3$ of boiling water into container B. Containers A and B are identical.



Container A Container B

Which one of the following is correct?

(1)

| Container | Temperature of water (°C) | Amount of heat (units) |
|---|---|---|
| A | 100 | 1200 |
| B | 100 | 1200 |

(2)

| Container | Temperature of water (°C) | Amount of heat (units) |
|---|---|---|
| A | 100 | 1200 |
| B | 100 | 500 |

(3)

| Container | Temperature of water (°C) | Amount of heat (units) |
|---|---|---|
| A | 100 | 1200 |
| B | 90 | 500 |

(4)

| Container | Temperature of water (°C) | Amount of heat (units) |
|---|---|---|
| A | 100 | 1200 |
| B | 90 | 1200 |

## END OF BOOKLET A

*Go on to Booklet B*



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# MARIS STELLA HIGH SCHOOL (PRIMARY)

## SA1 EXAMINATION

## SCIENCE

## 16 MAY 2019

## BOOKLET B

---

NAME: _____ (  )

CLASS: Primary 6 (  )

13 questions

44 marks

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

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

FOLLOW ALL INSTRUCTIONS CAREFULLY.

| | |
|---|---|
| **Booklet A:** | **/ 56** |
| **Booklet B:** | **/ 44** |
| **Grand Total:** | **/ 100** |

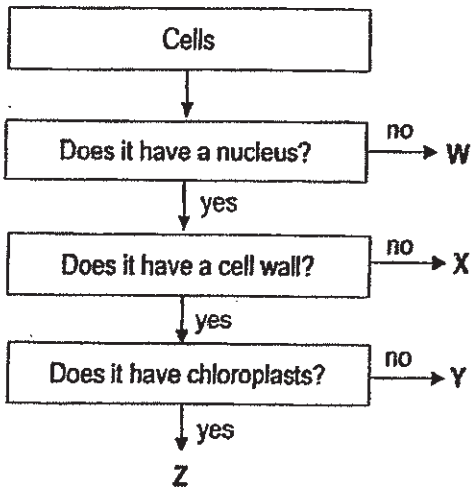
**Parent's Signature:** _____

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For questions 29 to 41, 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 Study the flowchart below.




(a) Which cell, W, X, Y or Z, cannot reproduce? [1]

(b) Which cell, W, X, Y or Z, is most likely taken from the root of a plant? Explain your answer. [1]

(c) State the function of the chloroplast. [1]

3



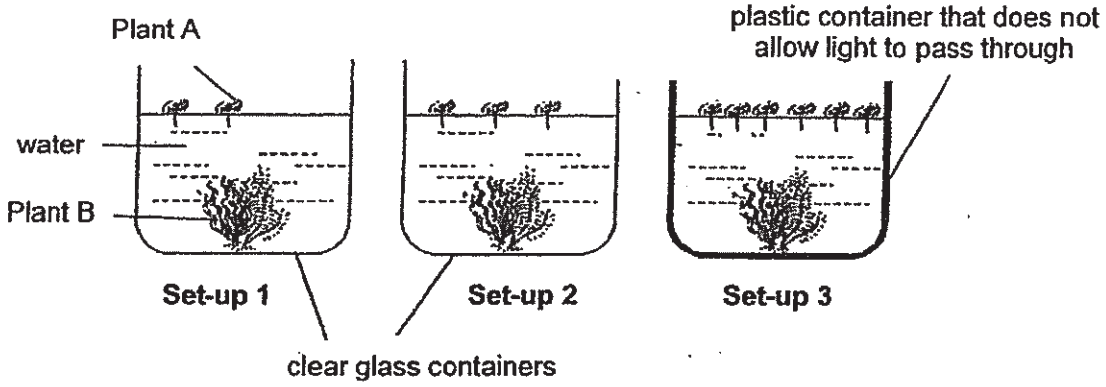
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30 Tom carried out an experiment to find out if the growth of Plant B is affected by the number of Plant A.

The diagrams below show the set-ups which he placed near the window for his experiment.




After 2 weeks, he noticed that the leaves of Plant B in Set-up 3 turned yellow.

(a) Explain why the leaves of Plant B in set-up 3 turned yellow. [1]

_____

_____

(b) Tom did not conduct a fair test.

Suggest a change to one of Tom's experimental set-ups to make it a fair test. [1]

_____

_____

(c) Suggest a control set-up to confirm that the growth of Plant B is only affected by the number of Plant A. [1]

_____

_____

| | 3 |
|---|---|

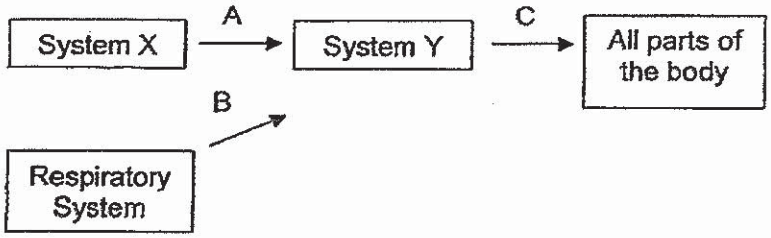


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31 The diagram below shows the direction of blood flow in some parts of the human body. Systems X and Y are two different human body systems.




**(a)** Identify systems X and Y. [1]

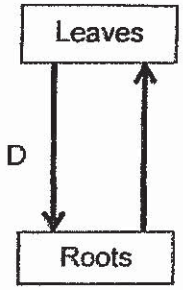
System X: _____

System Y: _____

**(b)** Name two substances that are transported by the blood in C. [1]

_____

The diagram below shows the plant transport system.




**(c)** Which arrow(s), A, B and/or C, in the human body system transport(s) similar substance as arrow D? [1]

_____

| | 3 |
|---|---|

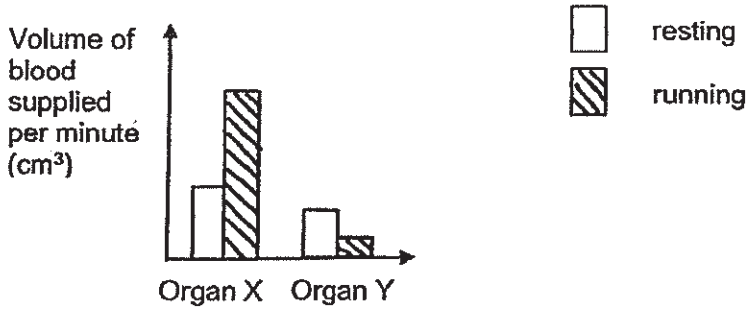


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The graph below shows the amount of blood supplied to the legs and small intestines of a person during resting and running.




**(d)(i)** Which organ, X or Y, represents the legs and small intestines? [1]

Legs: _____ Small intestines: _____

**(ii)** Using the graph above, explain why more blood is supplied to organ X when running. [1]

_____

_____

2

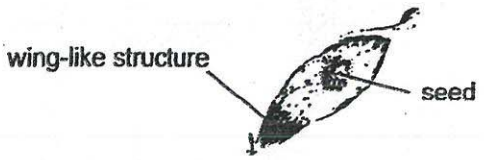


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32 Chee Beng was given two fruits from plant G. One fruit had its wing-like structure cut off and another fruit was left intact.




fruit with wing-like structure




fruit without wing-like structure

He dropped both fruits from a height of 10 metres and recorded the time the fruits took to reach the ground. His results are shown in the table below.

| | Time taken for fruit to reach the ground (s) | | | |
|---|---|---|---|---|
| | 1st try | 2nd try | 3rd try | Average |
| Fruit with wing-like structure | 8.6 | 8.1 | 8.5 | 8.4 |
| Fruit without wing-like structure | 4.5 | 4.8 | 4.2 | 4.5 |

(a) How are the fruits of plant G most likely dispersed? [1]

(b) Based on Chee Beng's results, explain how the fruit's wing-like structure helps the fruit in dispersal. [1]

(c) Other than having wing-like structures, state another likely characteristic of the fruits of plant G that helps them in dispersal. [1]

| | 3 |
|---|---|

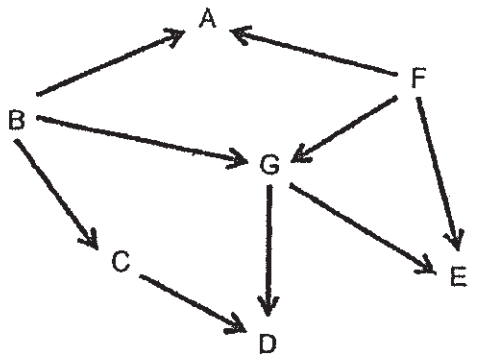


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33 Study the food web below.




**(a)** Fill in the table below with organisms from the food web. [1]

| Eats plant only | Eats meat only |
|---|---|
| | |

**(b)** What is likely to happen to the population of organism G if a disease killed all organism A in the community? Explain your answer. [2]

_____

_____

_____

**(c)** When organism P was introduced to the above community, the populations of both organism C and organism G increased within a short period of time.

Add organism **P** into the food web above. [1]

| | 4 |
|---|---|

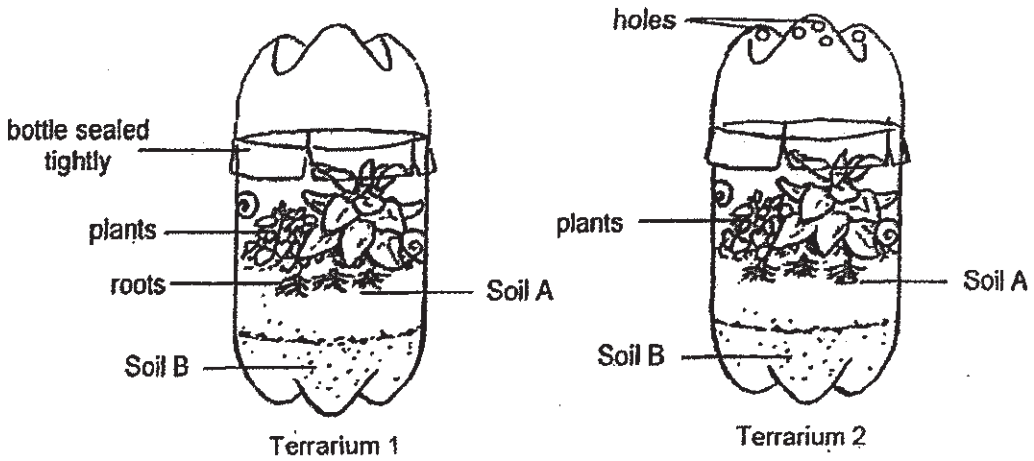


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34 Susan placed terrariums 1 and 2 by a window. Both terrariums are identical except that terrarium 2 has holes in its upper cover but terrarium 1 does not.




(a) Explain why terrarium 1 does not have to be watered as often as terrarium 2. [2]

(b) Susan used two types of soil, A and B, to build the terrariums. One of the soils had smaller soil particles than the other. Soils A and B are positioned such that the plants can take in as much water as possible.

Which soil, A or B, is likely to be the one with smaller soil particles? Give a reason for your answer. [1]

3

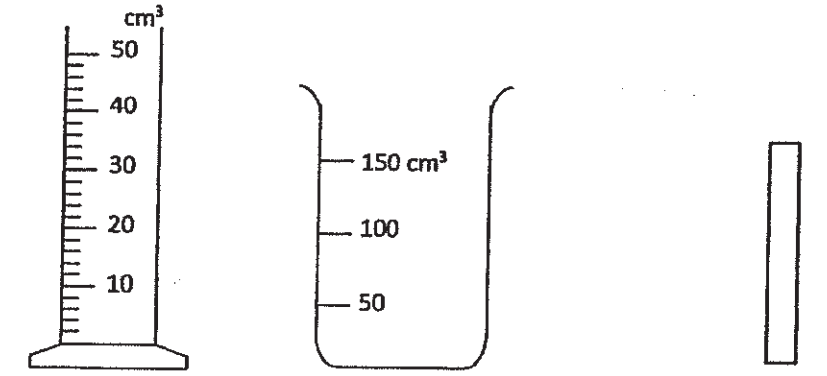


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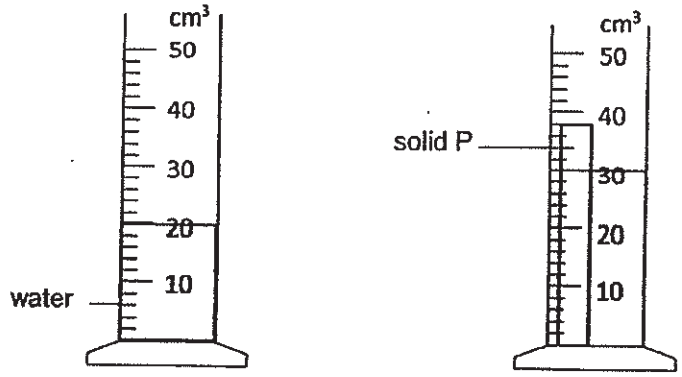
35 The diagrams below show a measuring cylinder, a beaker and solid P.




measuring cylinder A beaker B solid P

**(a)** The measuring cylinder is more suitable to measure the volume of solid P. Explain why. [1]

Roy placed solid P into measuring cylinder A and concluded that the volume of solid P is 10 cm³.




**(b)** Give a reason why it is wrong to say that the volume of object P is 10 cm³. [1]

**(c)** Max told Roy that in order to find the volume of solid P, he needs to fill cylinder A with 50 cm³ of water before placing solid P in.

Do you agree with Max? Explain your answer. [1]

3



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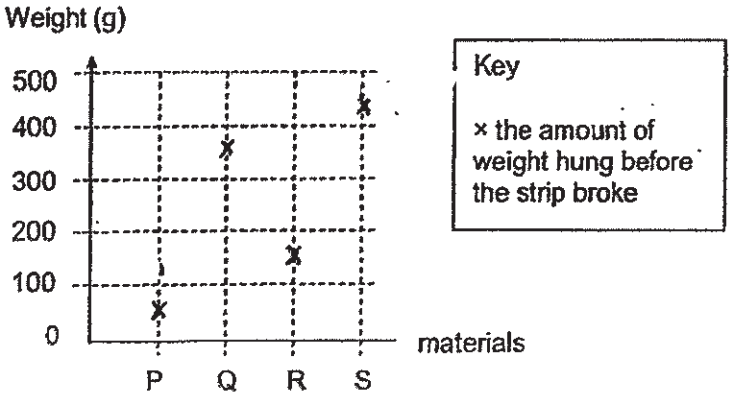
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36 Ron had 4 different strips of materials, P, Q, R, S, of the same length and thickness. He set up an experiment as shown below to test the strength of each material.




He hung 20-g weights, one at a time, on the strip made of material P until it broke. He repeated the experiment using strips Q, R and S. The graph below shows the amount of weight needed to break each material.




(a) Based on the graph, what can you conclude about materials P, Q, R and S? [1]

(b) What can Ron do to more accurately measure the strength of each material? [1]

(c) Other than the length and thickness of the strips, state another important variable that has to be kept the same for the experiment to be fair. [1]

3

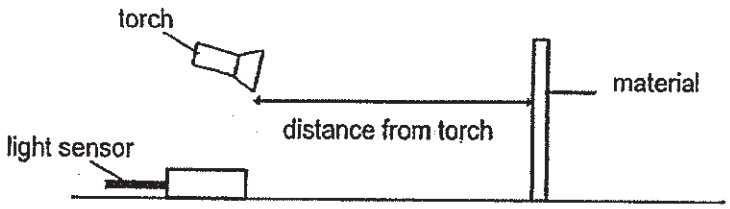


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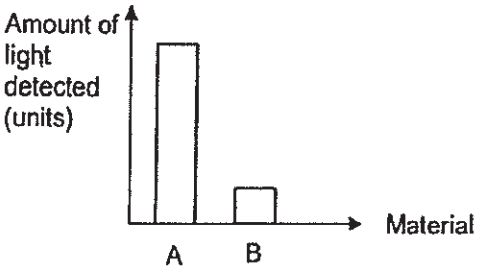
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37 Ethan conducted an experiment to find out how much light materials A and B reflect. He set up the experiment as shown below and placed materials A and B, one at a time, a fixed distance away from the torch.




He recorded the amount of light detected by the light sensor for each material. The graph below shows his results.




(a) Study the statements below and put a tick (✓) in the appropriate boxes. [2]

| | Statement | True | False | Not possible to tell |
|---|---|---|---|---|
| (i) | Material B allows light to pass through. | | | |
| (ii) | Material A reflects more light than material B. | | | |

(b) Explain why Ethan had to conduct the experiment in a dark room to ensure a fair test. [1]

_____

_____

| | 3 |
|---|---|

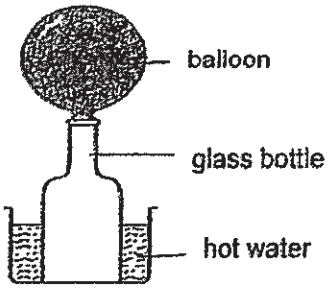


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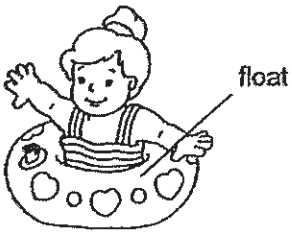
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38 Kim set up the experiment as shown below.




(a) Why did the balloon inflate when the glass bottle is placed in hot water? [1]

A float is used to keep someone afloat in the water.




(b) Kim observed that the float became firmer when she left it under the hot sun.
Give a reason for her observation. [1]

(c) Kim could continue to pump air into the float even when it was fully inflated.
What property of air does this show? [1]

3

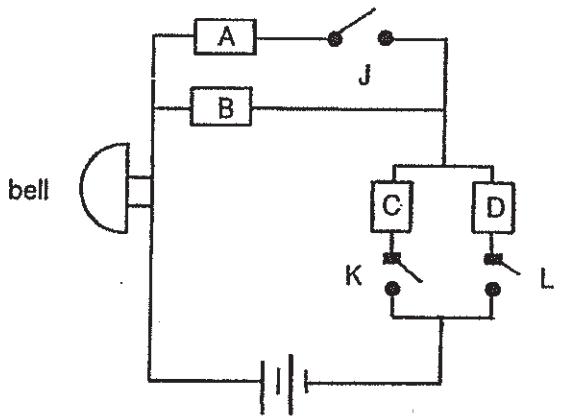


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39 Alex used the electrical circuit below to find out if materials A, B, C and D are conductors of electricity.




Alex's observations when different switches were closed are recorded in the table below.

| Switch J | Switch K | Switch L | Did the bell ring? |
|---|---|---|---|
| open | open | closed | Yes |
| open | closed | open | Yes |
| closed | open | closed | Yes |

(a) Study the statements below and put a tick (✓) in the appropriate boxes. [2]

| | Statement | True | False | Not possible to tell |
|---|---|---|---|---|
| (i) | Material A is a conductor of electricity. | | | |
| (ii) | Material B is a conductor of electricity. | | | |

(b) If material C is replaced with aluminium in the electrical circuit above, will the bell ring when all 3 switches, J, K and L, are closed? Explain your answer. [1]

_____

_____

| | 3 |
|---|---|

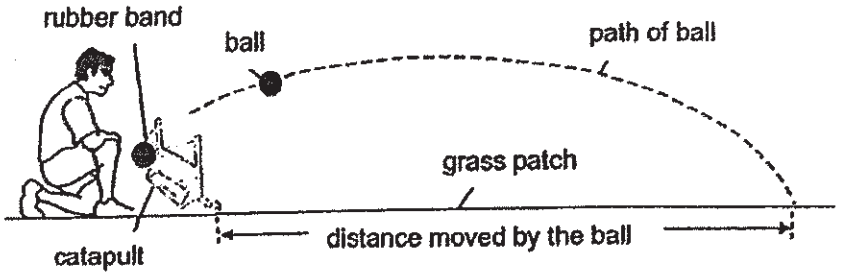


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40 Sam carried out an experiment with a catapult and a ball. When he pulls the rubber band back and releases it, the ball flies upwards before landing on the grass patch.




He measured the distance moved by the ball and recorded his results in the table below.

| | Distance moved by the ball (cm) |
|---|---|
| 1st try | 180 |
| 2nd try | 300 |
| 3rd try | 250 |

(a) Why is there a need for Sam collect results for three tries? [1]

_____

(b) Sam did not make any changes to his set-up for all three tries of his experiment. Suggest a reason for the big difference in the distance moved by the ball for each try. [1]

_____

_____

(c) Sam added 2 rubber bands to the catapult and repeated the experiment. How will this affect the distance moved by the ball? Explain your answer. [2]

_____

_____

(d) Sam's friend suggested that he conduct the experiment on a sand pit instead of the grass patch. How does the change help in measuring the distance moved by the ball? [1]

_____

_____

| | 5 |
|---|---|

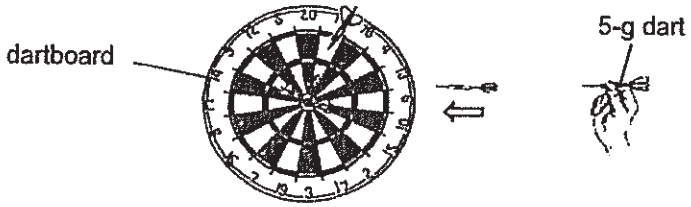


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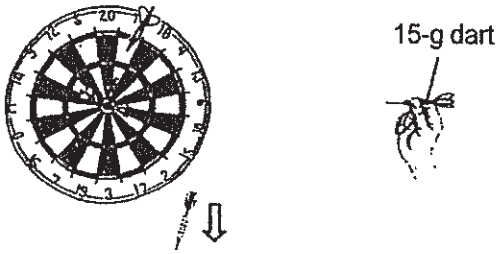
41 The picture below shows a dartboard. When Remy throws a 5-g dart onto the board, the dart remained on the board.




**(a)** Name the force that allowed the dart to remain on the board. [1]

_____

When Remy threw a 15-g dart onto the board, it stayed on the board for a while before falling to the ground.




**(b)** Give a reason for his observation made with the 15-g dart. [1]

_____

_____

**(c)** How can Remy throw the 15-g dart to ensure that it stays on the board after hitting the board? [1]

_____

_____

## END OF BOOKLET B

| | |
|---|---|
| | 3 |



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# ANSWER KEY

YEAR : 2019
LEVEL : PRIMARY 6
SCHOOL : MARIS STELLA
SUBJECT : SCIENCE
TERM : SA1

## BOOKLET A

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 |
|---|---|---|---|---|---|---|---|---|---|
| 4 | 4 | 4 | 2 | 2 | 4 | 2 | 2 | 3 | 1 |
| Q11 | Q12 | Q13 | Q14 | Q15 | Q16 | Q17 | Q18 | Q19 | Q20 |
| 2 | 4 | 1 | 2 | 4 | 1 | 3 | 2 | 4 | 3 |
| Q21 | Q22 | Q23 | Q24 | Q25 | Q26 | Q27 | Q28 | | |
| 1 | 4 | 1 | 1 | 2 | 3 | 3 | 2 | | |

## BOOKLET B

Q29 (a) Cell W.

(b) Cell Y. It has a nucleus and a cell wall but no chloroplasts.

(c) It traps sunlight and makes food.

Q30 (a) Set-up 3 was made with a plastic container that does not allow light to pass throught so the plant lesser sunlight to make food. Therefore, the leaves of Plant B turned yellow in set-up 3.

(b) Change set-up 3 to one with clear glass.

(c) Use the same container with the same amount of water with plant B but has no plant A.

Q31 (a) System X : Digestive system.
System Y : Circulatory system.

(b) Digested food and oxygen.

(c) C.

(d)(i) Legs : X Small intestines : Y

(ii) To allow the legs more oxygen and digested food to get more energy for

Q32 (a) By

(b) It to glide longer in the air and further away from the parent by wind.

(c) The seeds are light weight.

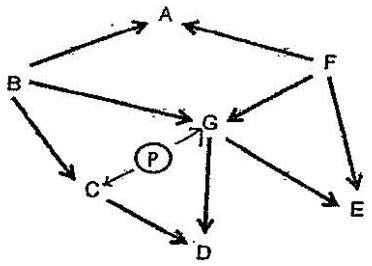
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Q33 (a) Eats plants only : A, C and G Eat meat only: D

(b) The population of organism G will increase as A feed on F and B. With no A, there would be more organism F and B as organism A feed on F and B. Organism G feeds on B amd F so with more organism B and F, G will have more food and organism G will increase.

(c)




Q34 (a) In terrarium 1, water from the soil and water, lost through to stomata will evaporate and water vapour will condense on the cooler surface of the top of the terrarium. The water vapour will condense to water droplets and drip down to soil. But water vapour can escape in terrarium B.

(b) Soil A. It has smaller air spaces to retain more water.

Q35 (a) Measuring cylinder A. It has smaller units of measurement which will give a more accurate reading.

(b) Solid P is not fully submerged.

(c) No. No reading above $50cm^3$ and water will overflow.

Q36 (a) S is the strongest followed by Q, R and P.

(b) Use smaller unit of weights.

(c) The weight of the weight. <OR> Distance between the planks position at which the weights were hung.

Q37 (a)(i) Not possible to tell.

(ii) True

(b) To ensure th[illegible]ted by the light sensor is only the reflected light [illegible]nd not other light sources.

Q38 (a) The [illegible]e gaine heat from the hot water and expanded and occupi[illegible]ore space. Therefore, the ballon will inflate.

(b) Air in the float gained heat from the sun and expanded. The air was more compressed causing the float became firmer.

(c) Air does not have a definite volume.



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Q39 (a)(i) Not possible to tell.

(ii) True

(b) Yes. Aluminium is a conductor of electricity so current can flow through and the circuit made the bell to ring.

Q40 (a) Increase reliability of results.

(b) Sam pulled the rubber band back to different distance.

(c) The distance moved by the ball will increase as more rubber bands. there will be more elastic potential energy to convert kinetic energy.

(d) A mark will be made on the sand.

Q41 (a) Frictional force.

(b) Gravittional force is greater than the frictional force between the dart and the board.

(c) Throw the dart with more force.



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