Index No. | | | | | | – | |

MAHA BODHI SCHOOL
2018 PRELIMINARY EXAMINATION
PRIMARY 6
SCIENCE
(BOOKLET A)

Name : _____ ( )

Class : Primary 6 _____

Date : 14 August 2018

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

INSTRUCTIONS TO CANDIDATES:

1. Write your Index No. in the boxes at the top right-hand corner.
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 answers in the Optical Answer Sheet (OAS) provided.

This booklet consists of 23 printed pages.

BOOKLET A : **[28 x 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). **Shade your answer on the Optical Answer Sheet.**

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1. Which of the following characteristics are most likely to be observed in each type of flower?

	wind-pollinated flower	insect-pollinated flower
(1)	large petals	small petals
(2)	feathery stigma	sticky stigma
(3)	produces nectar	does not produce nectar
(4)	gives off unpleasant smell	gives off pleasant smell

2. Which of the following cannot be found in the human circulatory system?

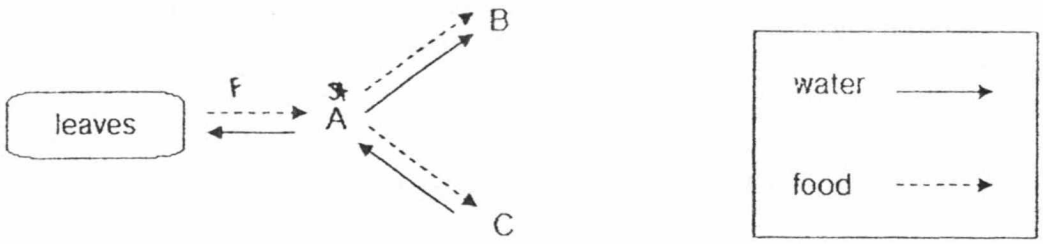
(1) water

(2) oxygen

(3) carbon dioxide

(4) undigested food

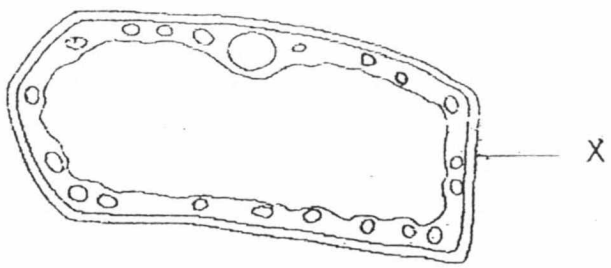
3. The diagram below shows how water and food are transported in a plant.



Which of the following shows the parts of the plant correctly?

	A	B	C
(1)	flowers	roots	stem
(2)	roots	stem	flowers
(3)	stem	flowers	roots
(4)	leaves	stem	leaves

4. The diagram below shows a cell.



What is the function of the part labelled X?

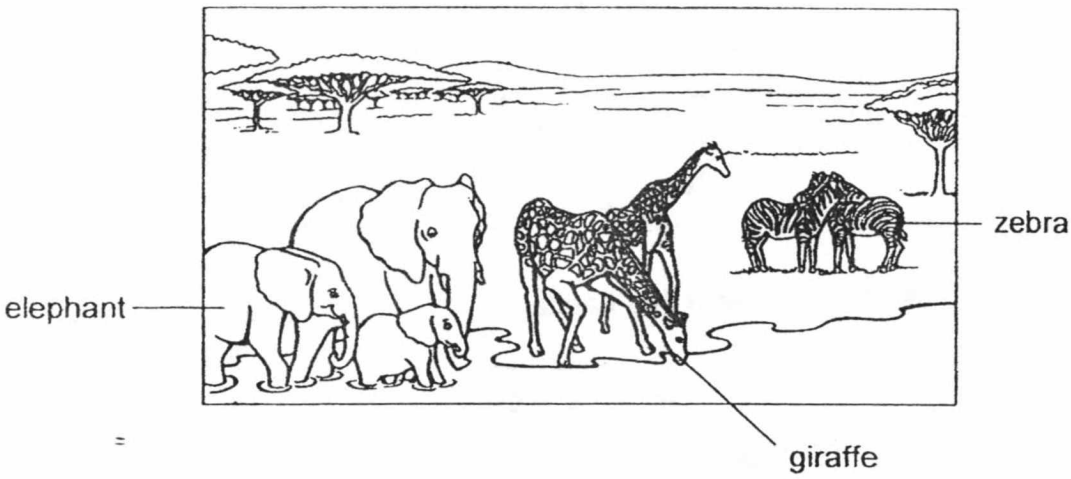
(1) To trap sunlight to make food.

(2) To control all activities in the cell.

(3) To allow activities to take place there.

(4) To support and give the cell its shape.

5. The diagram below shows a picture of a habitat.



Which of the following statements is true?

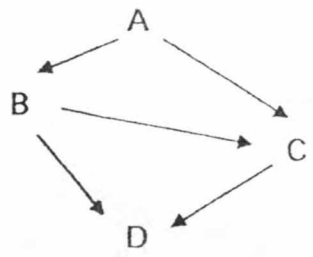
(1) The group of elephants form one community.

(2) The elephants, giraffes and zebras form 7 populations.

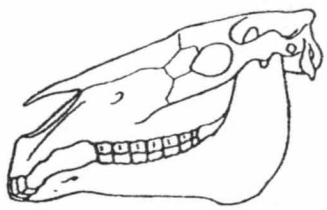
(3) The groups of elephants, giraffes and zebras form one population.

(4) The groups of elephants, giraffes and zebras form one community.

6. The diagram below shows a food web in a habitat.



A skull of an organism is found in that habitat.



skull

Based on the information above, which organism, A, B, C or D is most likely to have such a skull?

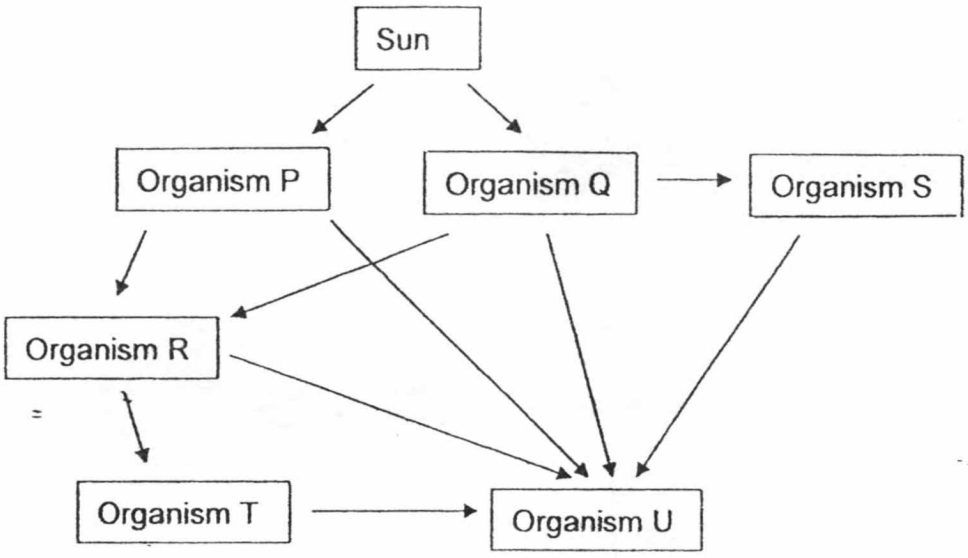
(1) A

(2) B

(3) C

(4) D

7. Study the transfer of energy shown in the diagram below.



Which of the following statements are true?

A. Organism U is a decomposer.

B. Organism T is an animal eater.

C. There are three food producers.

D. Organisms R and S are plant-and-animal eaters.

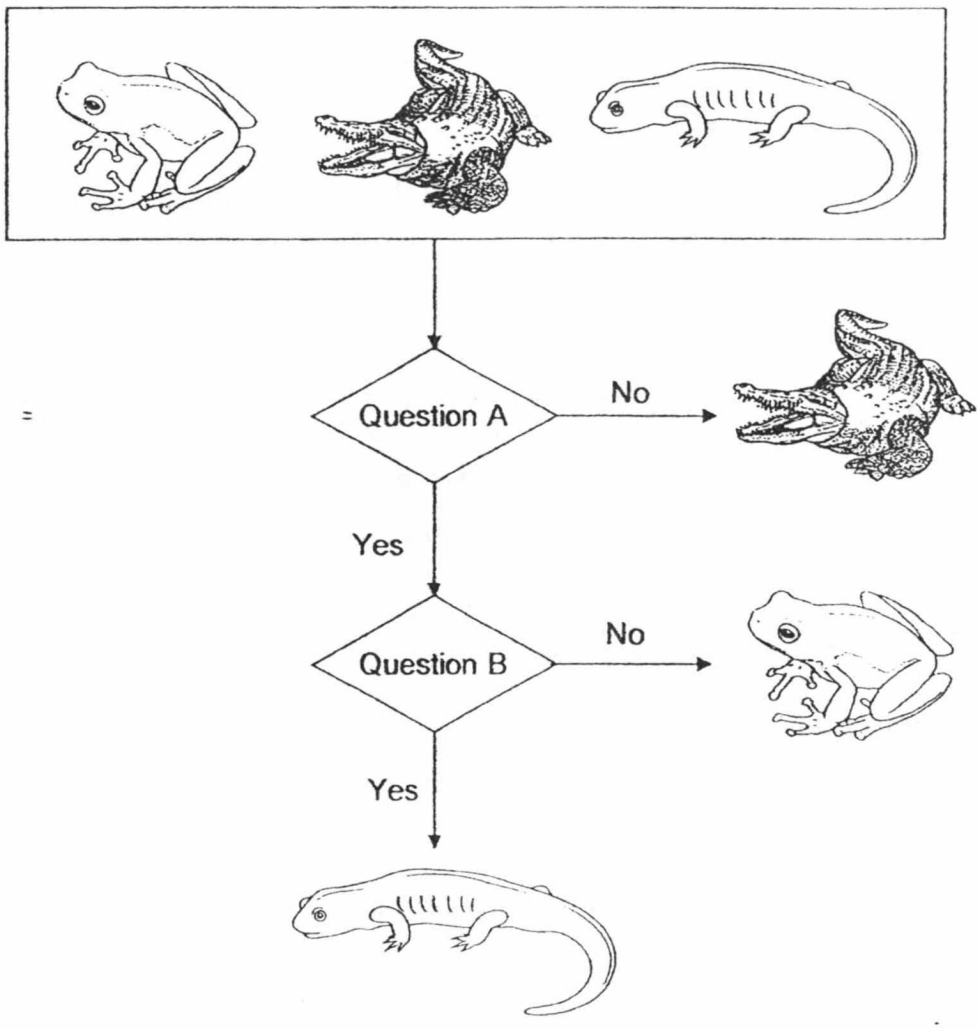
(1) A and B only

(2) C and D only

(3) B, C and D only

(4) A, B, C and D

8. Eva classified three animals using the chart shown below.



What are the two questions, A and B?

	Question A	Question B
(1)	Lays eggs?	Breathes through lungs?
(2)	Has moist skin?	Has scales?
(3)	Has moist skin?	Does the adult have a tail?
(4)	Breathes through skin?	Lays eggs?

9. Devi grew some seeds on four trays of cotton wool inside a room. The experimental conditions and results are shown in the table below.

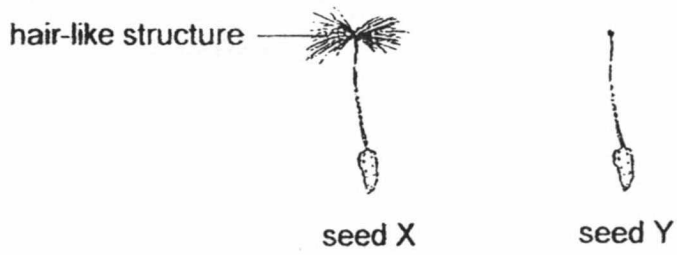
Tray	Presence of light	Presence of warmth	Average length of root (cm)
W	no	no	0
X	yes	yes	3
Y	yes	no	0
Z	no	yes	2

Devi wanted to confirm if germination would require light and warmth.

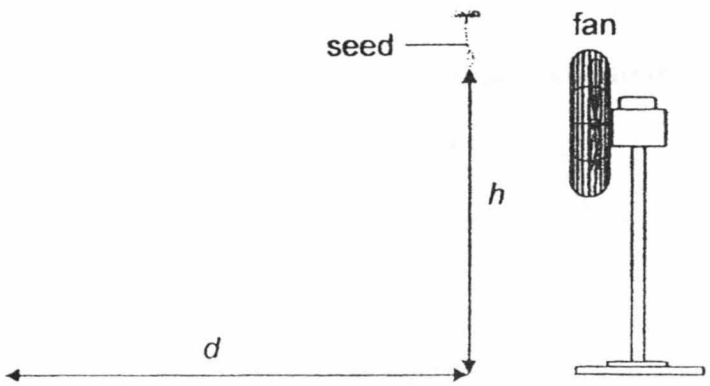
Which sets of trays should she compare in her investigation?

	Germination requires	
	light	**warmth**
(1)	W and X	Y and Z
(2)	W and Y	W and X
(3)	X and Z	W and Z
(4)	Y and Z	X and Y

10. Gina conducted an experiment using two seeds of similar size to find out how the height at which they were dropped would affect the distance they travelled. One of the seeds had its hair-like structure removed.



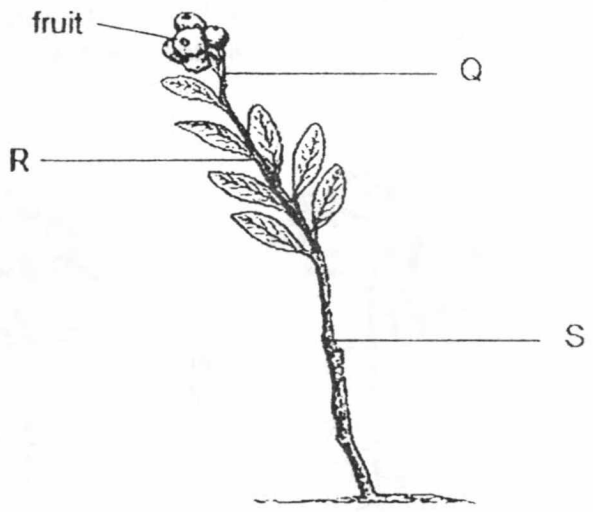
She dropped seed X from different heights, *h*, in front of a fan as shown. She measured the distance, *d*, travelled by seed X. She repeated the experiment with seed Y.



Which of the following distances were most likely to be observed by Gina?

	seed X		seed Y	
	***h* = 120 cm**	***h* = 60 cm**	***h* = 120 cm**	***h* = 60 cm**
(1)	30 cm	60 cm	20 cm	10 cm
(2)	30 cm	60 cm	10 cm	20 cm
(3)	60 cm	30 cm	10 cm	20 cm
(4)	60 cm	30 cm	20 cm	10 cm

11. The diagram below shows a plant which is bearing fruits. The plant has thick and long roots in the ground.



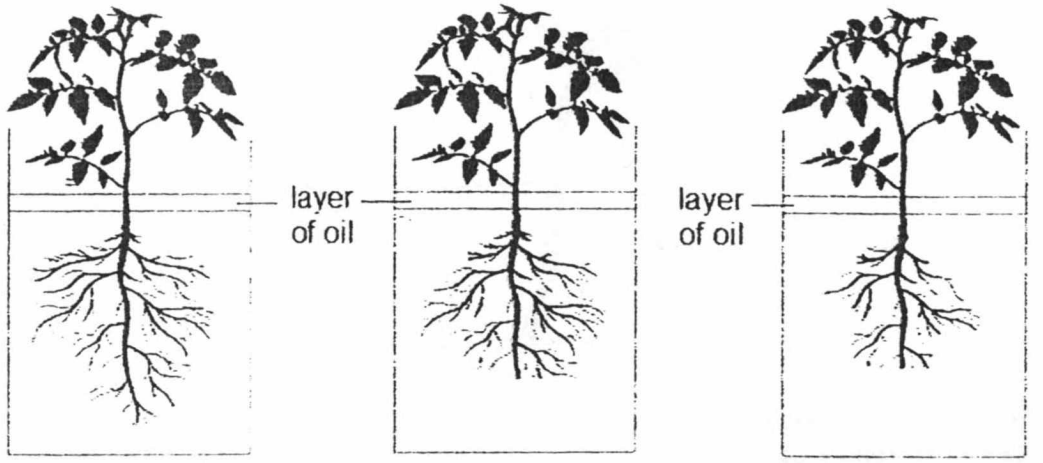
Position Q, R and S are locations where the food-carrying tube can be removed from the plant by cutting away the outer ring of its stem.

Which of the following shows correctly where the food-carrying tubes have been removed from the plant which results in the observations made?

	Observations about the plant	
	the fruit becomes the biggest	**the plant wilts the fastest**
(1)	Q	R
(2)	R	S
(3)	S	Q
(4)	S	S

12. Kelly conducted an experiment using the set-ups shown below. She placed three similar plants in identical containers with equal amounts of water. She added a layer of oil on the water surface.

She then coated some surfaces of the leaves with oil and trimmed off some of the roots, as shown below, before placing all the containers in the same location.



Container A (no oil coated on the leaves)

Container B (oil coated on the leaves)

Container C (no oil coated on the leaves)

The amount of water left in each container after one day was recorded.

Which of the following statements about the amount of water left in the container is/are true?

A Container A has the most amount of water left.

B. Container B has the least amount of water left.

C. Container C has the least amount of water left.

D. It cannot be determined if Container B has more water than Container C.

(1) C only

(2) D only

(3) A and D only

(4) A and B only

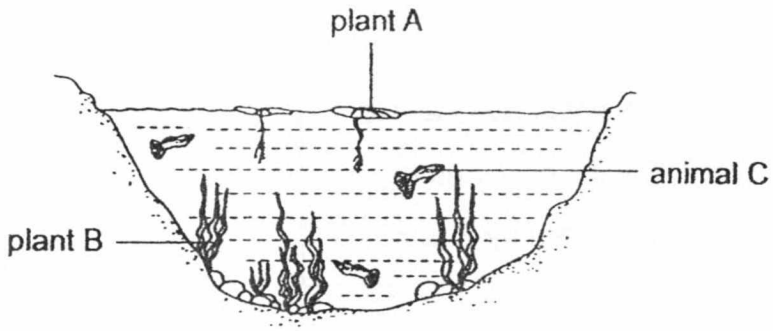
13. The following relationships were observed among five organisms P, Q, R, S and T.

S is eaten by Q and R.
P feeds on T and R.
Q is eaten by R and T.

Which one of the following classifications is correct?

	plant-eater	animal-eater	plant and animal eater
(1)	Q	T	R
(2)	Q	P and T	R
(3)	R	P	Q
(4)	R and T	Q and S	-

14. A large amount of animal waste flowed into a pond.



After some time, the population of plant B decreased.

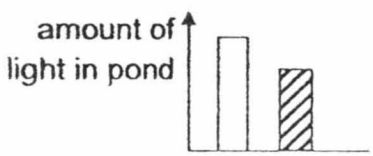
Which pair of graphs does not represent the effect of animal waste entering the pond?

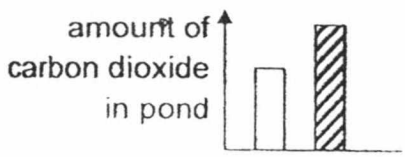
Key

□ before animal waste entered the pond

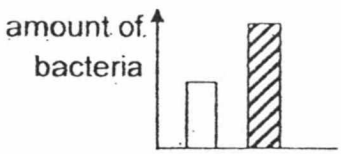
▨ after animal waste entered the pond

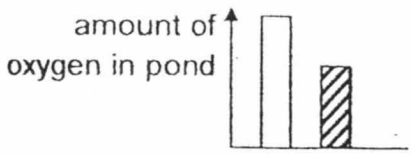
(1)



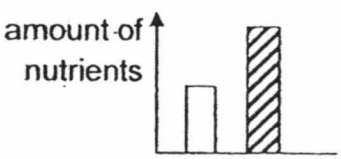


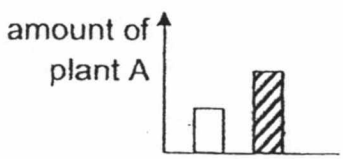
(2)



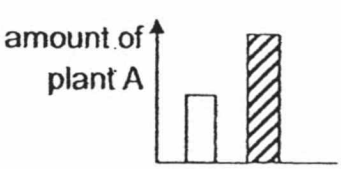


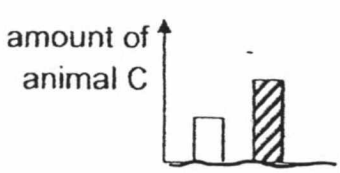
(3)



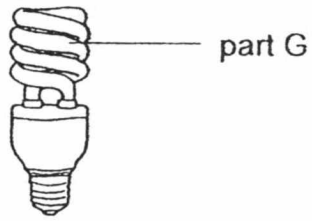


(4)





15. The diagram below shows a light bulb that gives off a lot of light when it is switched on.



Which property of part G enables the bulb to light up a room?

(1) flexible

(2) conductor of electricity

(3) good conductor of heat

(4) allows light to pass through

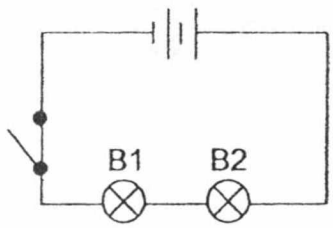
16. Alex prepared a classification table as shown below.

Group A	Group B
a tree an apple ink from a pen a metal ruler	heat from a flame sound from a police siren shadow of a dog

Which of the following shows the correct heading for each group?

	Group A	Group B
(1)	solids	non-solids
(2)	matter	non-matter
(3)	has definite shape	has no definite shape
(4)	has definite volume	has no definite volume

17. Study the circuit shown below.



Which of the following would make bulb B2 less bright?

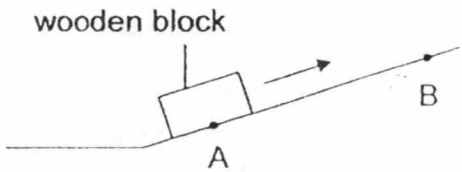
(1) Add a bulb in series arrangement

(2) Add a bulb in parallel arrangement.

(3) Add a battery in series arrangement.

(4) Replace bulb B1 with a piece of wire.

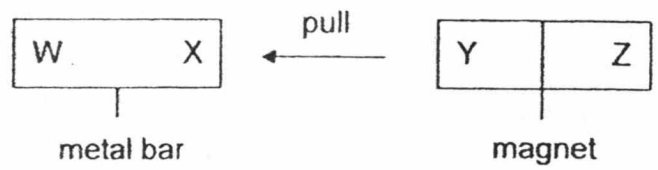
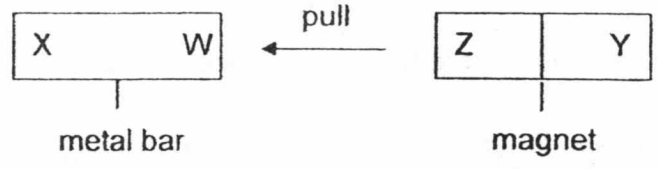
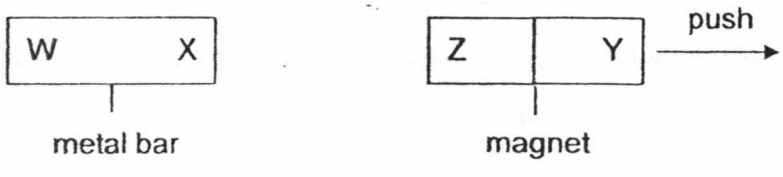
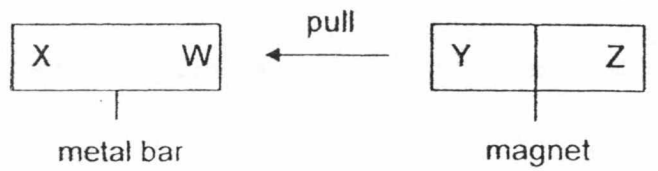
18. A wooden block was pushed up a slope as shown.



Which of the following about the amount of gravity and the direction of friction acting on the wooden block is correct as the block moved from A to B?

	Amount of gravity	Direction of friction
(1)	increased	→
(2)	increased	←
(3)	remained the same	→
(4)	remained the same	←

19. Lisa wanted to find out if a metal bar is a magnet. She drew four diagrams A, B, C and D as shown below.

Diagram A	
Diagram B	
Diagram C	
Diagram D	

Which pair of diagrams allows her to confirm that the metal bar is a magnet?

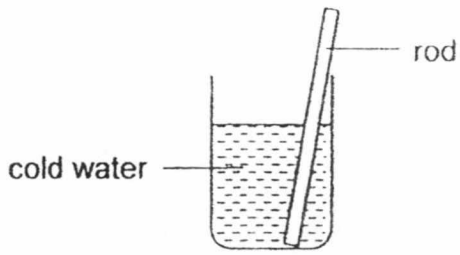
(1) A and B

(2) A and D

(3) B and C

(4) C and D

20. Hugo placed a metal rod into a container of cold water as shown below. After some time, his hands felt cold when he touched the rod.



Which one of the following correctly explains Hugo's observation?

(1) The rod lost heat to the water and to his hand.

(2) The rod gained heat from the water and from his hand.

(3) The rod lost heat to the water and gained heat from his hand.

(4) The rod gained heat from the water and lost heat to his hand.

21. The table below shows the properties of a substance at different temperatures.

Temperature (°C)	Has fixed volume?	Has fixed shape?
0	Yes	Yes
100	Yes	Yes
150	Yes	No
250	No	No

Which of the following statements about the substance is/are definitely true?

A. It is water.

B. It melts at 150°C.

C. It is a gas at 250°C.

D. Its freezing point is lower than 150°C.

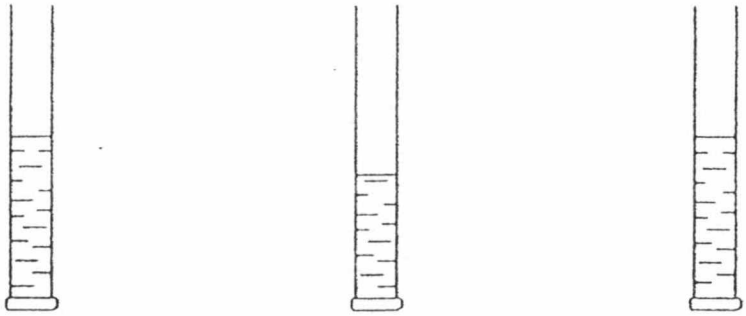
(1) A and D only

(2) B and C only

(3) C and D only

(4) B, C and D only

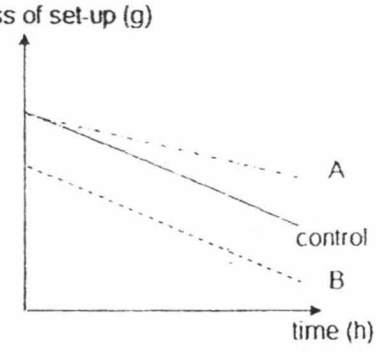
22. An experiment was conducted to determine the factors that affect the rate of evaporation of water. Three set-ups were used in the experiment, as shown below.



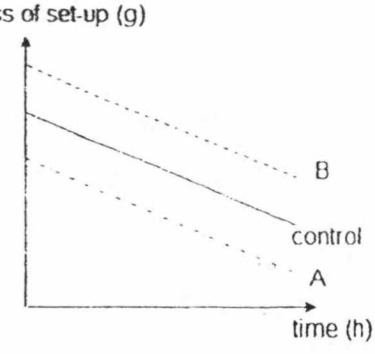
Control	A	B
70 ml of water	50 ml of water	70 ml of water
30°C	30°C	40°C

Which of the following graphs shows most accurately, the change in mass of the set-ups over a period of time?

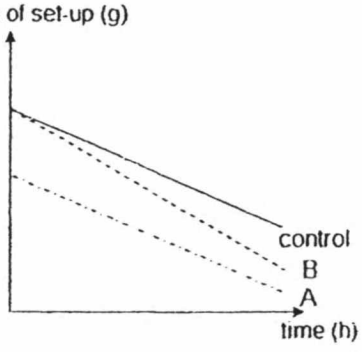
(1)



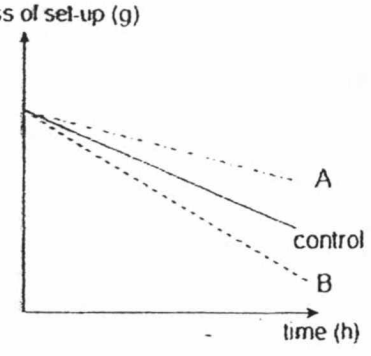
(2)



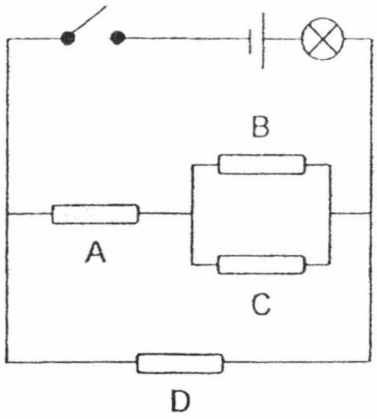
(3)



(4)



23. Beverly wanted to investigate whether four rods, A, B, C and D were electrical insulators. She used the circuit as shown below.



The bulb lighted up when the switch was closed.

The table below shows what happened when the switch was closed and certain rod(s) was/were removed.

Rod(s) removed from circuit	Did the bulb light up?
A	yes
D	yes
B and D	yes
C and D	no

Which rod(s) was/were electrical insulator(s)?

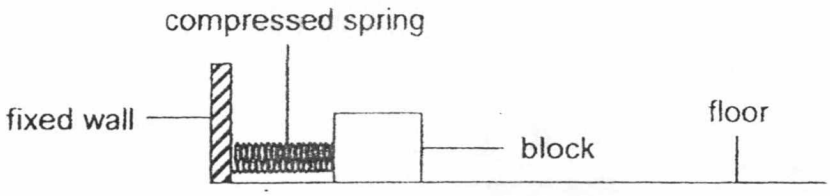
(1) B only

(2) A and B only

(3) B and D only

(4) C and D only

24. Megan conducted an experiment to find out how mass affected friction.



She pushed the block against the spring at a fixed length before releasing it. She measured the distance moved by the block. She repeated the experiment using blocks made of the same material but of different mass.

Her results are shown below.

Block	Length of compressed spring (cm)	Distance moved by block (cm)
A	8	12
B	6	15
C	8	15
D	4	12

Based on the results, which of the following is true?

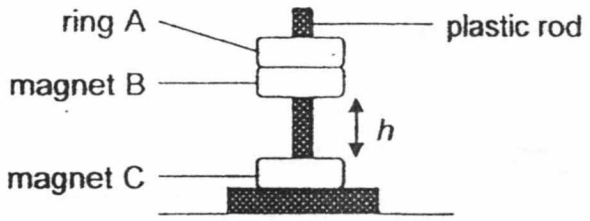
(1) Block C was the lightest in mass.

(2) Block A was the heaviest in mass.

(3) There was more gravity acting on block B than on block C.

(4) The amount of friction acting on blocks A and D was the same.

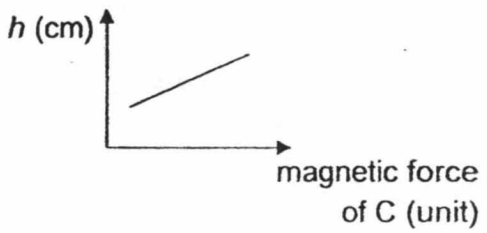
25. In the set-up below, three rings, A, B and C passed through a smooth plastic rod.

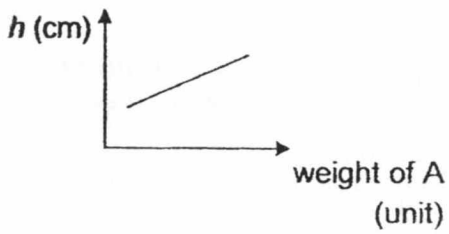


Height *h* represents the distance between the two ring magnets.

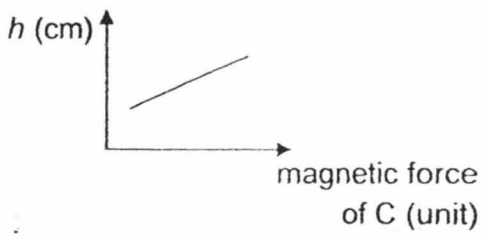
Which pair of graphs correctly shows the relationships between the forces acting on magnet B and height *h*?

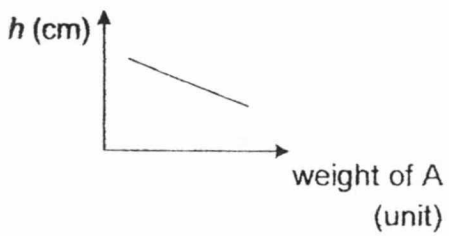
(1)



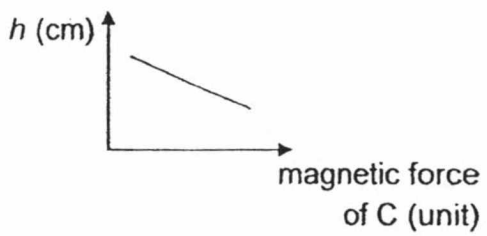


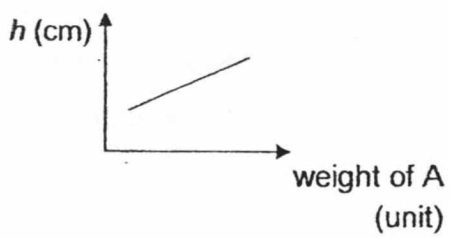
(2)



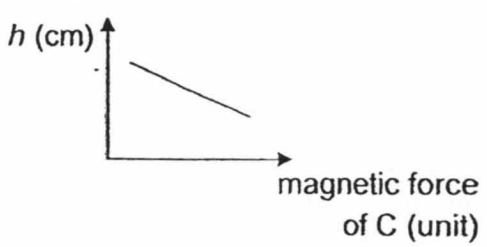


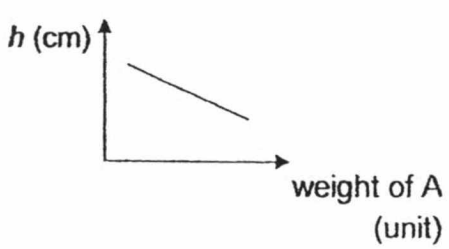
(3)





(4)





26. A steel bar AB was magnetised using the "stroke" method as shown in Diagram 1 below. A compass was then placed near end B and the north pole of the compass needle faced end B as shown in Diagram 2.

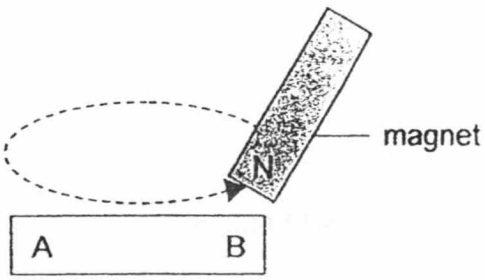


Diagram 1

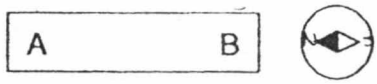


Diagram 2

Another steel bar CD was magnetised using a magnet as shown in Diagram 3.

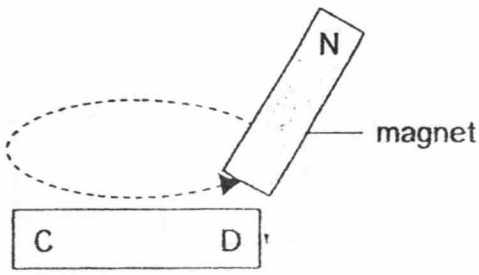
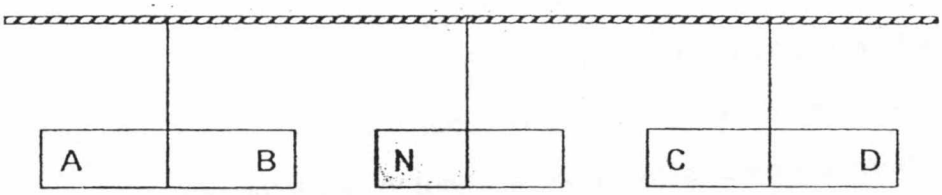


Diagram 3

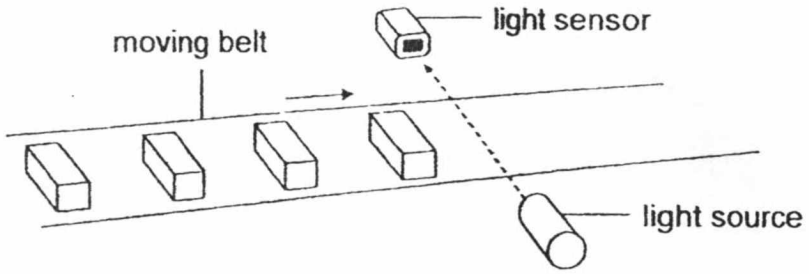
The magnet and the two magnetised steel bars were then suspended by metal wires as shown below.



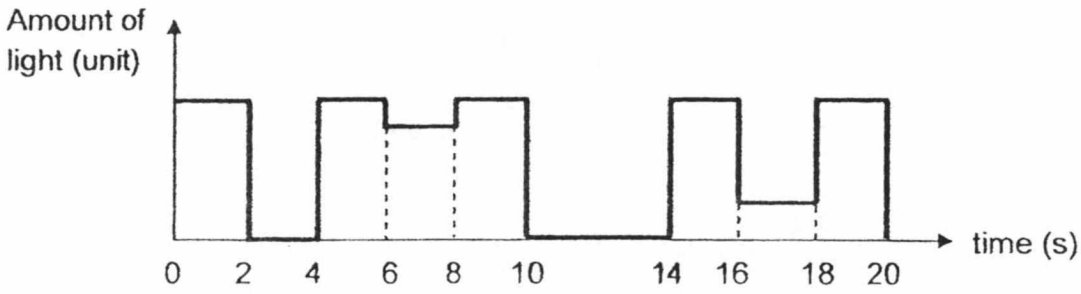
What would most likely to be observed for steel bars AB and CD?

	steel bar AB	steel bar CD
(1)	attracted to magnet	attracted to magnet
(2)	attracted to magne	repelled by magnet
(3)	repelled by magnet	attracted to magnet
(4)	repelled by magnet	repelled by magnet

27. The set-up below uses a light sensor to count the number of objects on a moving belt. The objects are of the same size.



The graph below shows the data recorded when the objects passed the light sensor within a period of 20 seconds.



Based on the graph above, which of the following statements is/are correct?

A. Five objects moved past the light sensor

B. The belt did not move at a constant speed

C Two of the objects were placed further apart.

D All the objects allowed same amount of light to reach the sensor.

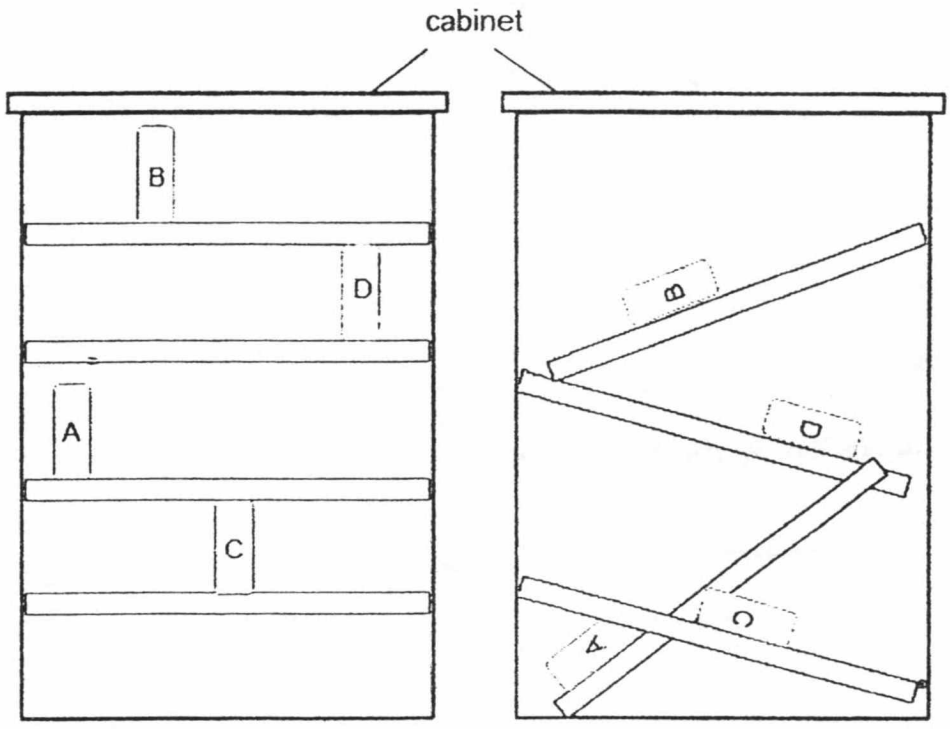
(1) B only

(2) A and C only

(3) B and D only

(4) A, C and D only

28. Four books, A, B, C and D, of equal mass and size were placed in a cabinet. The support for the shelves in the cabinet broke and the books came falling down with the shelves.



before the shelves fell

after the shelves fell

Which of the books lost the greatest amount of energy when the shelves fell as shown in the second diagram above?

(1) A

(2) B

(3) C

(4) D

END OF BOOKLET A

GO ON TO BOOKLET B

Index No. | | | | | | – | |

MAHA BODHI SCHOOL
2018 PRELIMINARY EXAMINATION
PRIMARY 6
SCIENCE
(BOOKLET B)

Name : _____ ( )

Class : Primary 6 _____

Date : 14 August 2018

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

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5. Write all your answers in this booklet.

Booklet	Marks Obtained	Max Marks
A		56
B		44
Total		**100**

Parent's Signature : _____

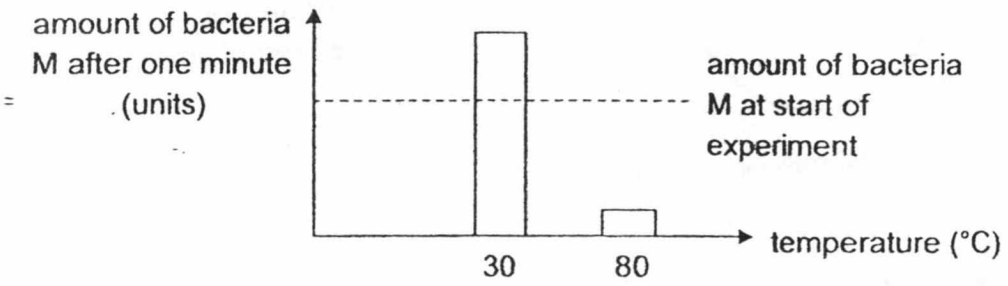
This booklet consists of **20** printed pages.

BOOKLET B : [44 marks]

For questions 29 to 41, write your answers in this booklet.

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

29. (a) Andrew carried out an experiment to find out the growth rate of bacteria M. He prepared the same amount of bacteria at different temperatures and monitored them for one minute. His results are shown below.



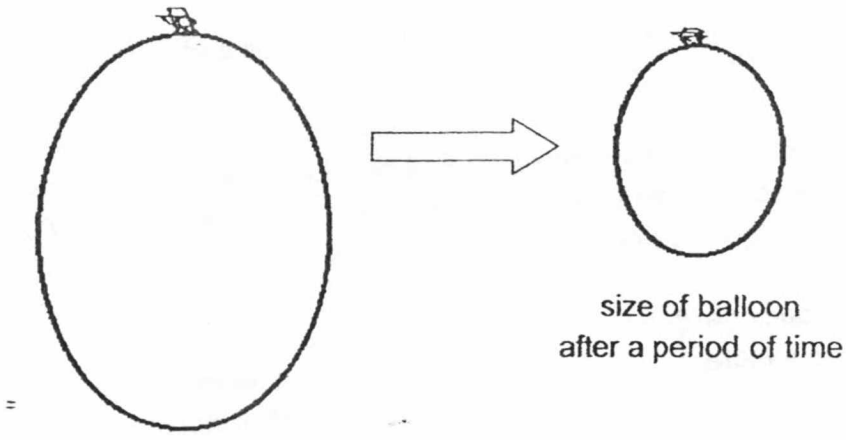
Based on the results, explain why it would be safer to eat food that is constantly heated than to eat food that is kept at room temperature. [1]

(b) (i) Some food packets have all the air removed from their packaging. Explain how this way could prevent the food in the packet from spoiling. [1]

(ii) Besides the factors mentioned above, name and explain how another factor could prevent the food in the packet from spoiling. [1]

Marks : / 3

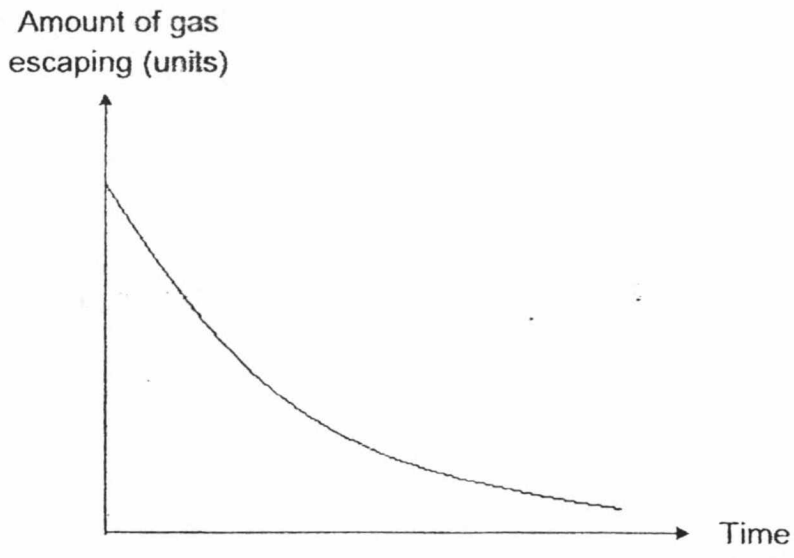
30. The diagram below shows the change in size of a balloon when gas escaped from the entire surface of a balloon over a period of time.



size of balloon
after a period of time

size of balloon
at the beginning

The amount of gas escaping from the balloon was recorded over a period of time and represented in the graph below.



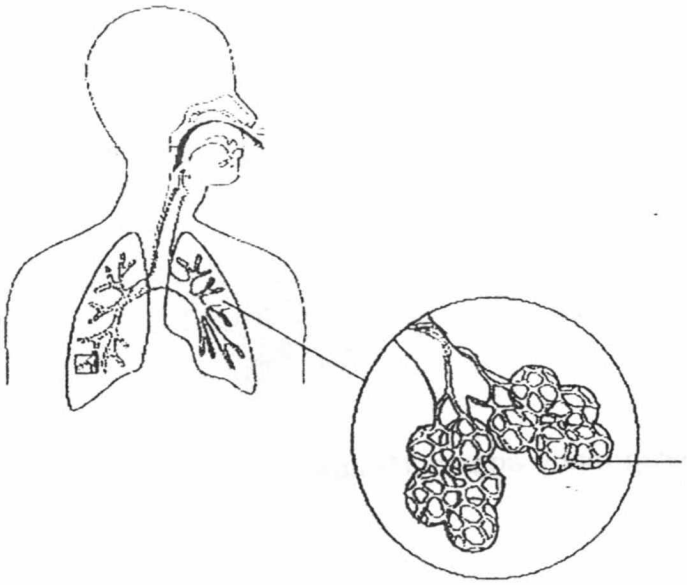
(a) Based on the above results, how would the size of the balloon affect the rate at which gas escaped from the balloon? [1]

_____

_____

Marks : / 1

(b) The diagram below shows a close-up diagram of the human lungs.



The human lungs have numerous tiny air sacs which allow the exchange of gases.

(i) Explain the purpose of the blood vessels surrounding the air sacs. [1]

_____

_____

(ii) In some patients with lung diseases, the tiny air sacs become smaller.

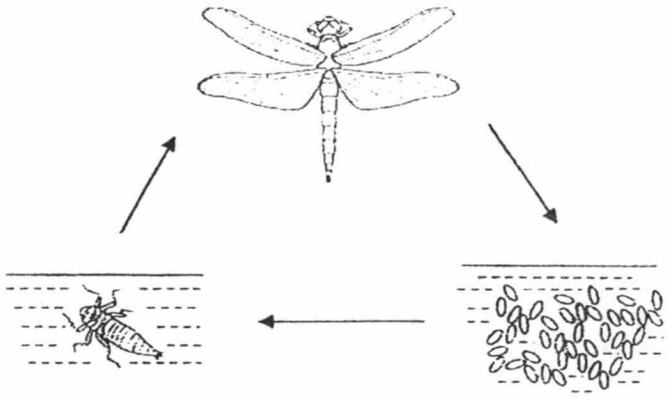
Explain how this affects the rate of absorption of oxygen. [1]

_____

_____

Marks : / 2

31. The diagram below shows the life cycle of insect X.



(a) Explain how by laying many eggs each time can help insect X in their survival. [1]

_____

_____

(b) The nymphs of insect X live in water while the adult insect X lives out of water. This helps insect X to survive better.

Suggest two advantages for the young and the adult to live in different surroundings. [2]

Advantage 1 : _____

_____

Advantage 2 : _____

_____

Marks : ____ / 3

32. Plant R bears flowers that look and smell like female bees.

(a) Explain how these structural adaptations enhance the survival of plant R. [1]

_____

_____

(b) Animal Q is a predator of bees.

(i) Explain how animal Q, by building its nest near plant R, can enhance its own survival. [1]

_____

_____

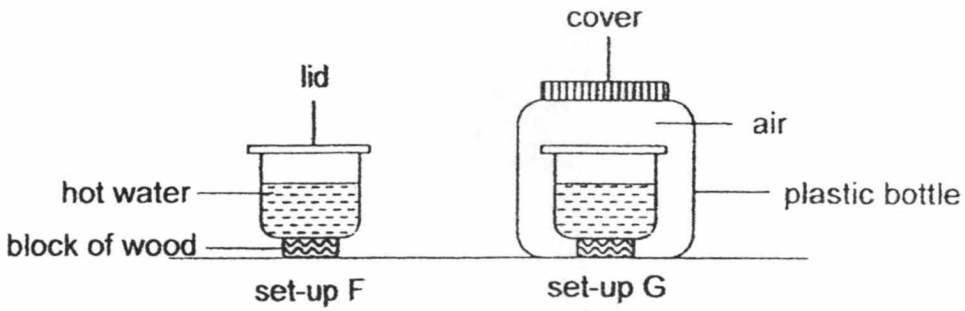
(ii) With animal Q living in the same habitat, how would the population of plant R change after some time? Explain your answer. [1]

_____

_____

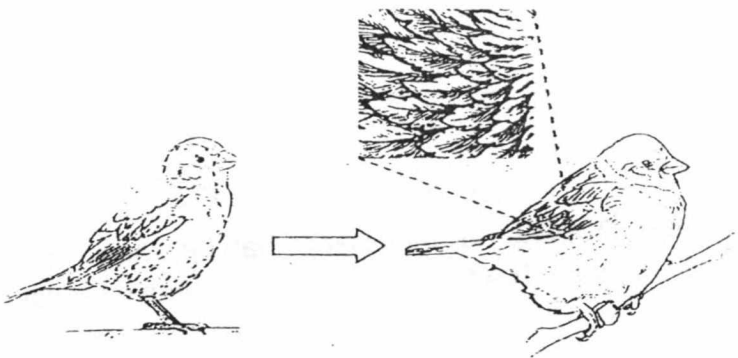
Marks : / 3

33. Jacky conducted an experiment using the set-ups shown. The two containers were identical and contained hot water at the same temperature.



(a) After some time, Jacky observed that the temperature of water in set-up G was higher than that in set-up F. Explain Jacky's observation. [2]

(b) On cooler mornings, bird W puffs up its feathers.



puffs up its feathers

Based on the results of Jacky's experiment, explain how puffing up the feathers of bird W would help to keep it warm. [1]

Marks : / 3

(c) Bird W can coat special oil on its feathers so that they could become waterproof.

uncoated feather

coated feather

Suggest two reasons how coating feathers helps to keep bird W warm.

= [2]

Reason 1:

_____

_____

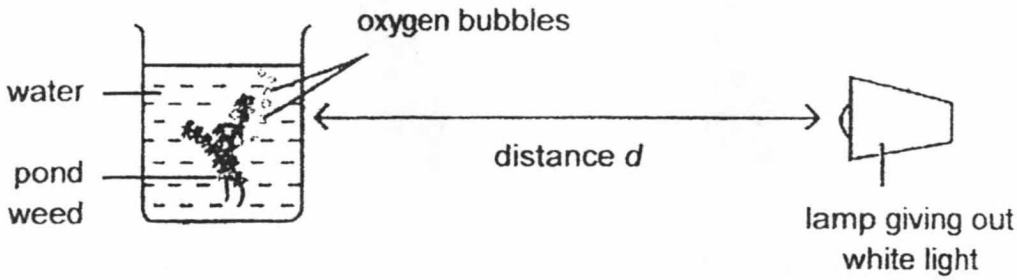
Reason 2:

_____

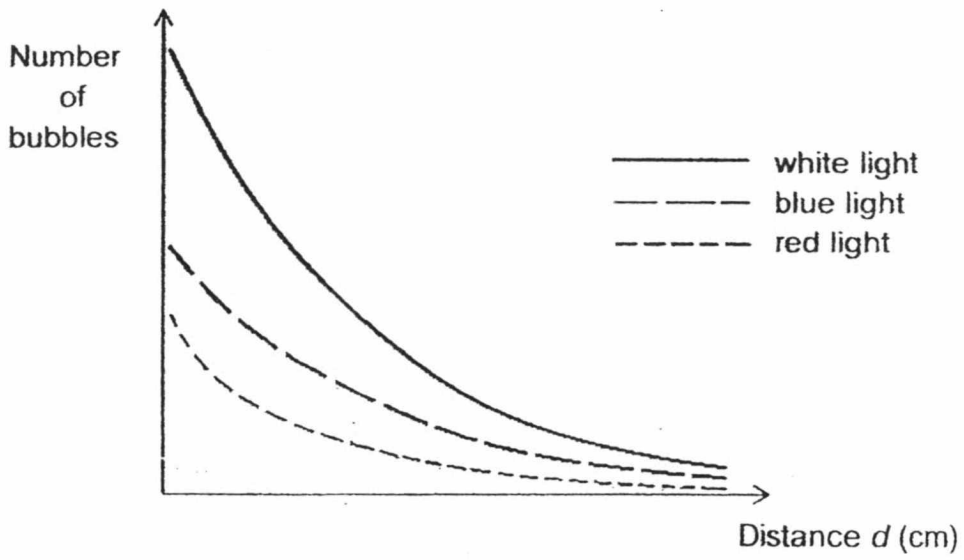
_____

Marks : / 2

34. Tom wanted to investigate the effect of the intensity of different coloured lights on the rate of photosynthesis. The experiment was set up as shown below.



He measured the number of bubbles given out at different distances. He repeated the experiment using blue and red light. The results are shown in the graph below.



(a) Explain why the number of bubbles decreased as distance *d* increased.

[1]

_____

_____

Marks : ____ / 1

(b) Tom had some fishes and pond weeds in his aquarium at home.
Based on the results, which coloured light was most suitable for the survival of the fishes? Explain your answer. [1]

_____

_____

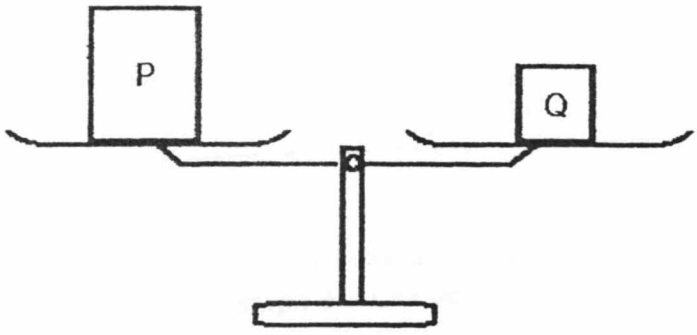
(c) Explain how the number of bubbles given out by the plant would be affected if more fish are added into the aquarium. [1]

_____

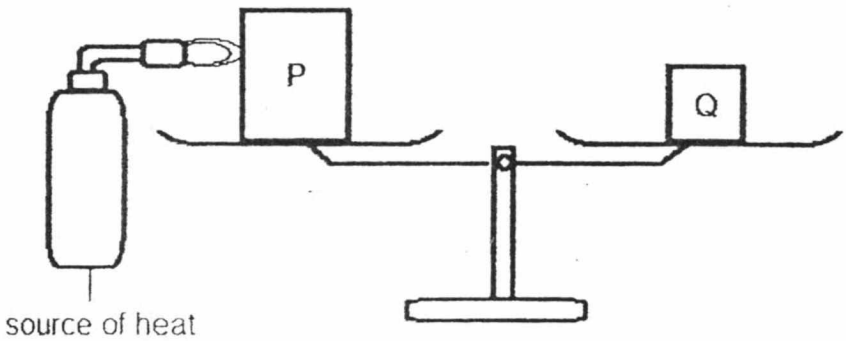
_____

Marks : ____ / 2

35. The diagram below shows a beam balance with two metal blocks, P and Q. The beam is horizontal.



Metal P is then heated as shown in the next diagram below.

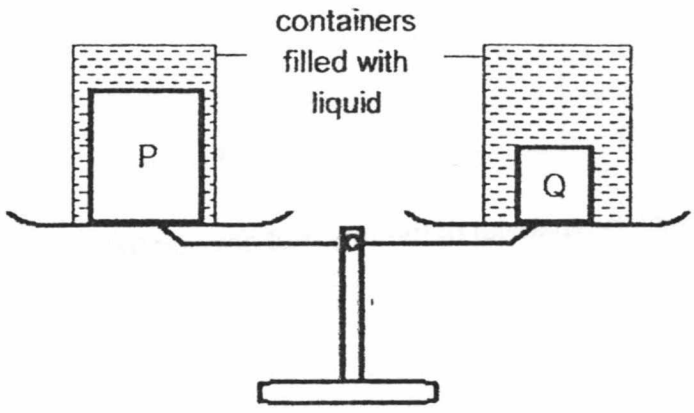


(a) State what would happen to metal block P after heating it for some time. [1]

(b) Would metal block P move up, move down or remain stationary on the beam balance as it is being heated? Explain your answer. [1]

Marks : / 2

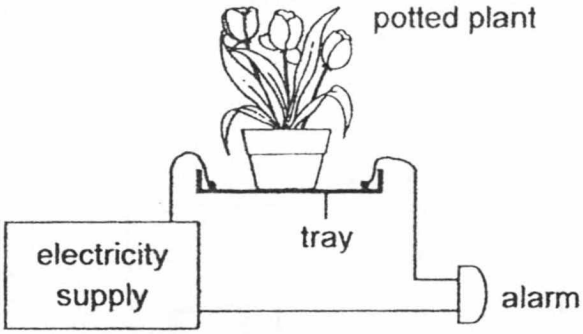
(c) The metal block Q and the heated metal block P are now placed inside identical containers filled to the brim with a liquid and placed on the beam balance. The liquid is able to maintain the temperature of the metal blocks.



Would metal block P now move up, down or remain stationary on the beam balance? Explain your answer. [1]

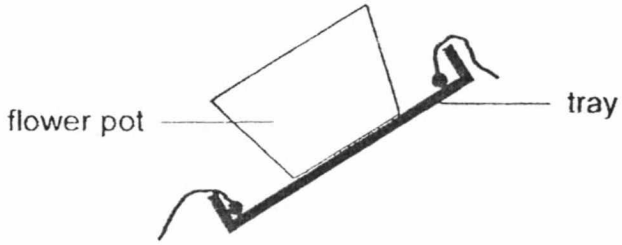
Marks : / 1

36. Francis designed a set-up that could alert him if water was collected in the tray of the potted plant. The alarm would sound off when the metal contacts were in contact with water.



(a) State a property of the material of the tray that allowed the set-up to work properly. [1]

(c) The tray was tilted and the flower pot was secured so that it did not slide downwards.



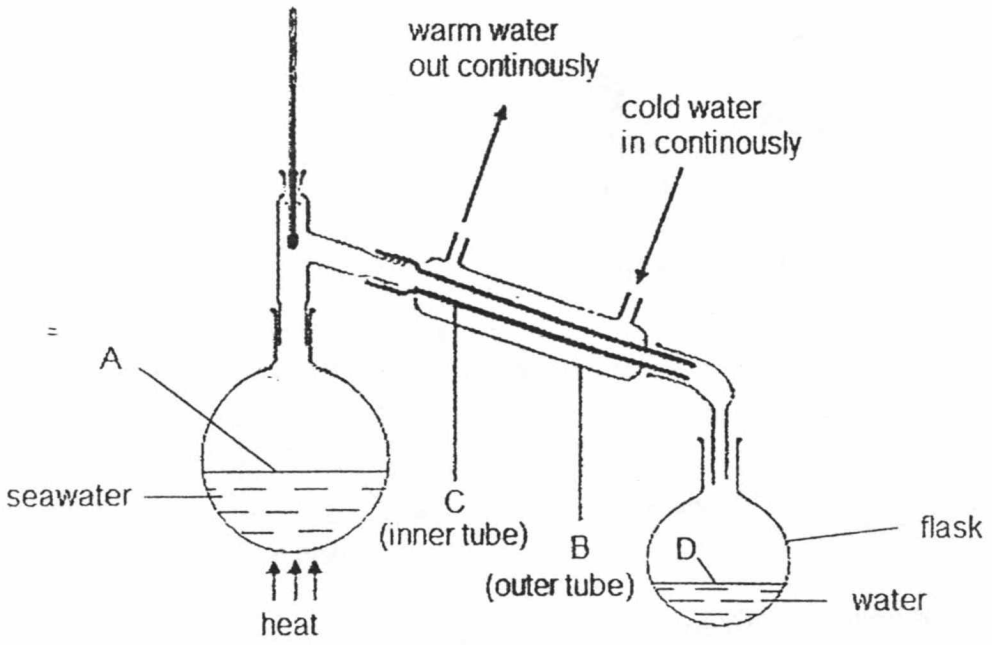
Would the set-up still work if water continued to be collected in the tilted tray? Explain your answer. [1]

(b) The set-up was unable to work properly if too little water flowed out from the flower pot.

Without adding or removing any parts in the set-up, suggest a way to make the alarm give off sound when less water is collected in the tray. [1]

Marks : / 3

37. The diagram below shows a set-up used to obtain water by heating sea water. Cold water is passed through the outer tube continuously. Water is then collected in the flask.



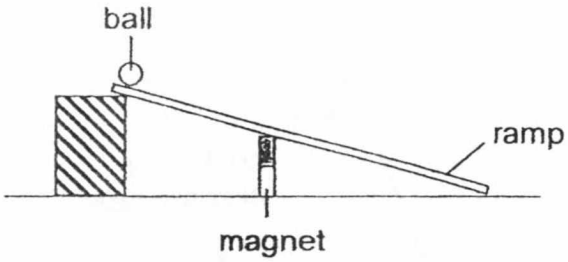
(a) In which part of the set-up labelled A, B, C or D, does evaporation and condensation take place? [1]

Evaporation	
Condensation	

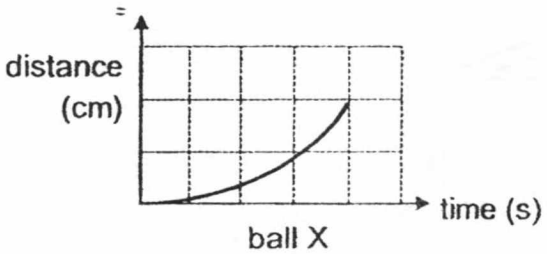
(b) Explain why the rate at which water collected in the flask decreases when cold water stops flowing through the outer tube. [2]

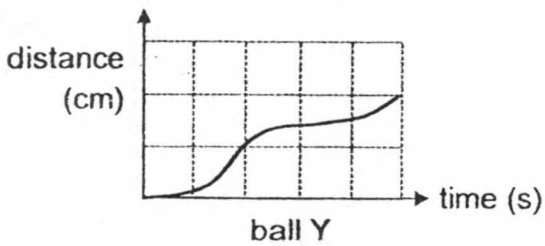
Marks : / 3

38. Kathy wanted to compare how fast different metal balls can move using the set-up below. She released the ball, measured the distance moved by the ball down the ramp and the time taken to reach to the end of the ramp.



Her results are shown in the graph below.





(a) Both metal balls X and Y had the same mass and size.
State the property of the material of each of the two balls that caused the difference in the results. [1]

Ball X: _____

Ball Y: _____

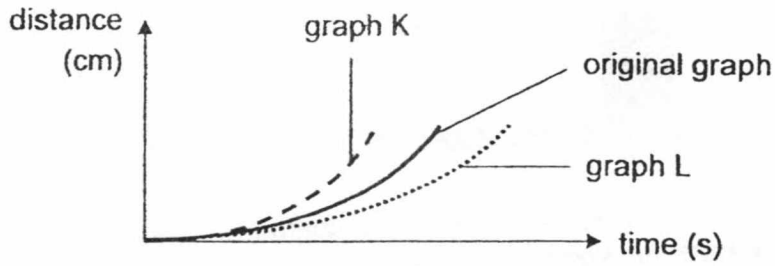
(b) Based on the results, how could Kathy tell that a different force had acted on ball Y? [1]

_____

_____

Marks : ____ / 2

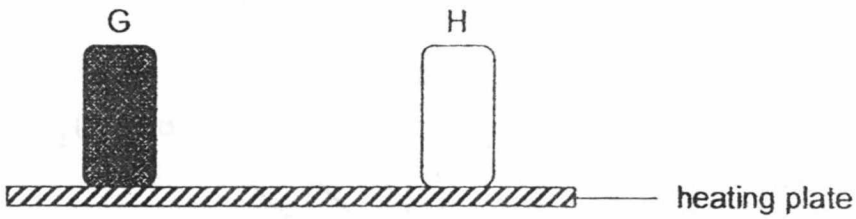
(c) Kathy also wanted to compare how fast ball X can move on different ramps. She conducted the experiment using different ramps of the same length. The results are shown below.



Which graph, K or L, shows the correct results when a rougher ramp was used? Explain your answer. [1]

Marks : / 1

39. Irene conducted an experiment using two identical sealed metal containers, G and H, as shown. Container G had a surface painted black while Container H had a surface painted white.



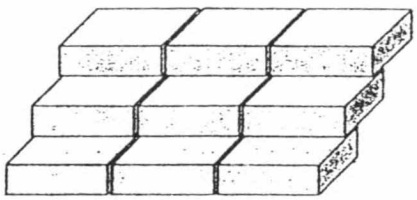
Before heating, the temperatures of air in the containers were the same. After heating the containers for some time, Irene observed that the temperature in container G was higher than that in container H.

(a) Based on her observation, what could Irene conclude about the difference between the surface of containers G and H? [1]

_____

_____

(b) (i) Irene observed that a building has thick black tiles on the roof.



Based on Irene's experiment, explain why it is more likely for the thick black tiles to crack on a very hot day. [1]

_____

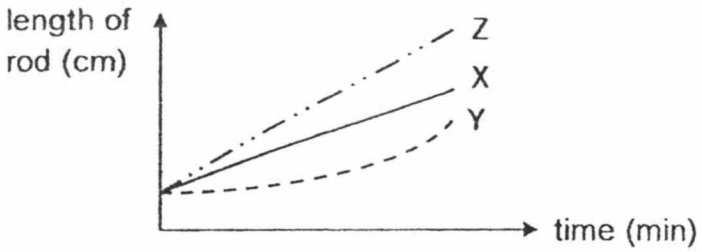
_____

(ii) Suggest one change to the roof tiles so that they would not crack easily on a very hot day. [1]

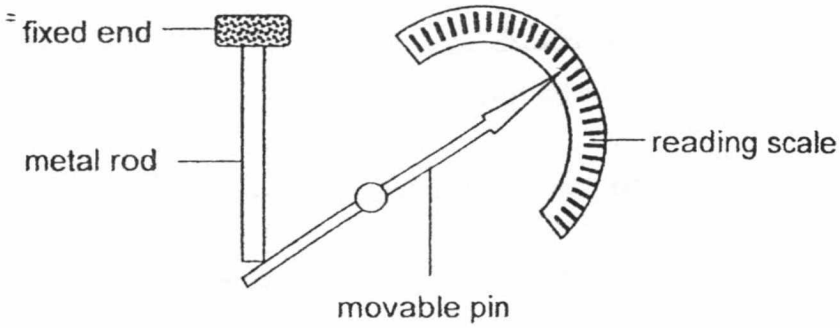
_____

Marks : ____ / 3

Irene conducted another experiment by heating three similar metal rods, X, Y and Z for a period of time. The results are shown in the graph below.



Irene made a model of a thermometer shown below.



When the metal rod expands, it pushes the end of the pin down. The pin will then move and point to a marking on the reading scale.

(c) (i) Based on the results of the experiment, explain why metal rod Z is more suitable to be used in the model. [1]

_____

_____

(ii) Based on the results of the experiment, give a reason why using metal rod Y in the model would give inaccurate reading. [1]

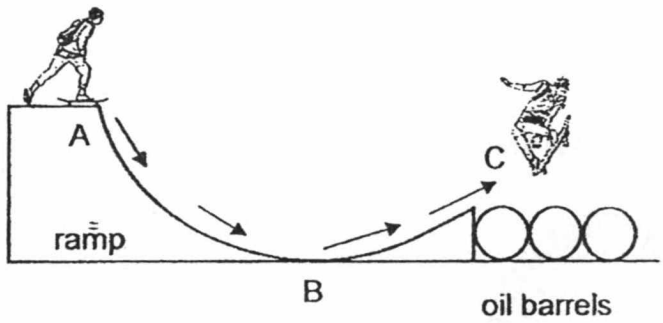
_____

_____

Marks : ____ / 2

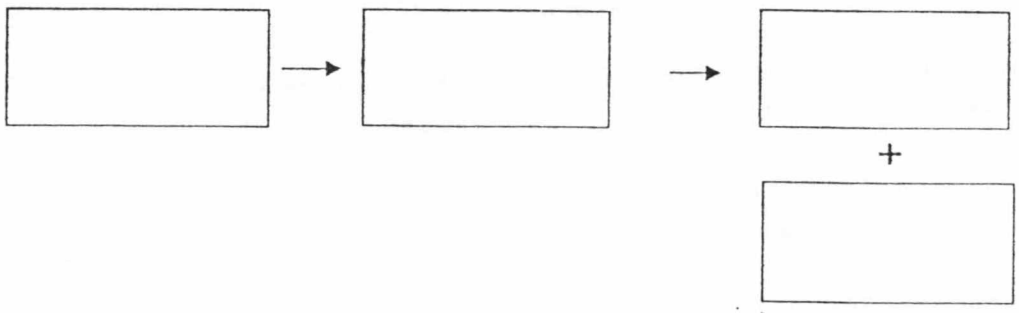
40. A stuntman did a jump over three oil barrels on his skateboard.

He was balancing at the edge of the top of the ramp before he moved down as shown in the diagram below. He took off into the air when he reached the end of the ramp.

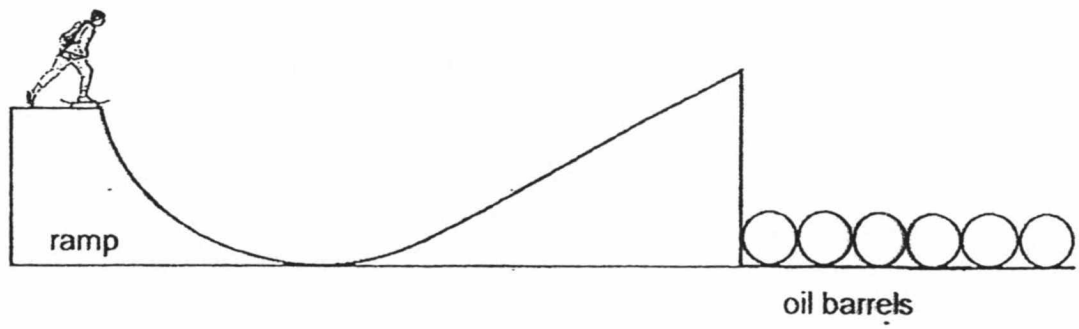


(a) State the energy conversion that took place from point A to point C. [1]

Energy at A: Energy at B: Energy at C:



The stuntman wanted to jump over six oil barrels on his skateboard. He extended the ramp to go further and higher.



Marks : / 1

(b) Explain why the stuntman would not succeed in jumping over the six oil barrels. [2]

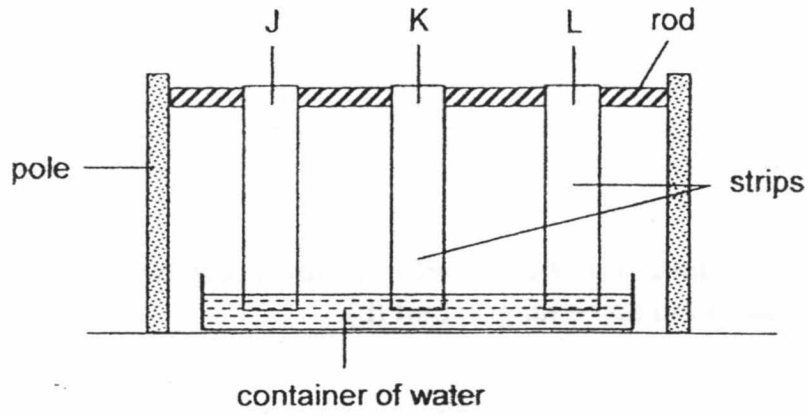
(c) Suggest what the stuntman could do in order to jump successfully over the six oil barrels using the same ramp in part (b). [1]

(d) A thin coat of oil is applied on the ramp.

Explain how this coat of oil enables the stuntman to jump higher in terms of energy changes. [1]

Marks : / 4

41. Calvin set up an experiment as shown below to find out how fast materials, J, K and L, would absorb water. One end of each strip of material was hung on a rod while the other end was soaked in water.



The distance travelled by the water up each strip of material at the end of the experiment is shown in the table below.

Material	J	K	L
Distance travelled by water (cm)	5	9	7

(a) Based on the results, which material can dry a table in the shortest time? Explain your answer. [1]

_____

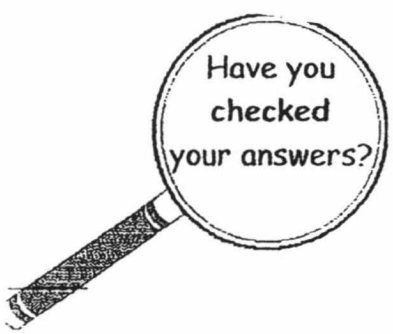
_____

(b) Explain how using a stiff rod makes the experiment a fair test. [1]

_____

_____

~ END OF PAPER ~



Marks : ____ / 2

ANSWER KEY

YEAR : 2018
LEVEL : PRIMARY 6
SCHOOL : MAHA BODHI SCHOOL
SUBJECT : SCIENCE
TERM : PRELIMINARY EXAMINATION

BOOKLET A

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

BOOKLET B

Q29a) More bacteria are killed, so there is less bacteria in the food.

Q29b) i: Without air, bacteria cannot reproduce because they need air to respire.

ii: Presence of water. Decomposers need water to survive.

Q30a) The smaller the size of the balloon, the slower the rate of gas escaping from the balloon.

Q30b) i: To allow oxygen in the lungs to enter the blood vessels and be carried to other plants of the body and carbon dioxide in the blood vessels to enter the lungs.

ii: The rate of absorption of oxygen is decreased as the surface area / area of contact between the air sacs and the blood vessels for absorption becomes smaller.

Q31a) It increases the chance of eggs hatching and growing into adults to continue the life cycle.

Q31b) i: Less competition for food

ii: When one habitat becomes unfavourable, the other stage of insect X can still survive.

Q32a) Male bees or predators of bees will be attracted to the flower and help in the pollination of flowers.

Q32b) i: When bees visit the flowers of plant R, animal Q is nearby and can eat the bees. This ensures animal Q gets its food easily.

ii: Population of plant R would decrease. With fewer bees to pollinate the flower, reproduction of the plant cannot take place.

Q33a) The air in the bottle is a poor conductor of heat. The air slowed down heat loss from the hot water.

Q33b) When the bird puffs up its feathers, more air is trapped. Air reduces the loss of heat from the body.

Q33c) i: Water would not reach the body, so no water can gain heat from the body to evaporate.

ii: The feathers can trap more air to reduce loss of heat from the body.

Q34a) The intensity of light decreased and this led to a decrease in the rate of photosynthesis.

Q34b) White light was most suitable (Claim) because the most number of bubbles were produced. (Evidence) The amount of oxygen produced for the fruit to breathe would be the highest.

Q34c) The number of bubbles would increase. More fish would produce carbon dioxide which would increase the rate of photosynthesis.

Q35a) The metal will gain heat and expand.

Q35b) The metal block P remain stationary. There is no change in weight/mass when the metal block P expands.

Q35c) The metal block P moves up as there is less liquid in the container.

Q36a) The tray is not a conductor of electricity.

Q36b) No, the set-up will not work. Only one end of the wire would be in contact with the water, resulting in an open circuit.

Q36c) Place the wires closer to the pot. Tilt the tray. Place both wires at the lower end of the tilted tray.

Q37a) i: A or D or both
ii: C or B or both

Q37b) When the cold water stops flowing, the temperature of C gradually increases and heat is not removed. As the water vapour loses less heat, less water vapour condenses to form water.

Q38a) Ball X: non-magnetic
Ball Y: magnetic

Q38b) The magnetic force slowed down the ball as it moved down the ramp, so it took a longer time to reach the end of the ramp.

Q38c) Graph L. The ball took a longer time to move down the ramp. There was more friction on the rougher ramp to slow down the ball.

Q39a) Black surface absorbs / gains more heat than a white surface.

Q39b) i: The top surface of the block tile will gain more heat than the bottom surface and so expand more. The uneven expansion causes the tile to crack.

ii: Change to white / lighter coloured tiles

Q39c) i: Metal rod Z increased in length the most. The thermometer will be able to detect the change in temperature more accurately.

ii: Rod Y did not expand at the same rate.

Q40a) gravitational potential energy → kinetic energy → Gravitational potential energy → kinetic energy.

Q40b) The end of the ramp is higher than where he started out from. He would not have enough gravitational potential energy converted into kinetic energy to go higher than his starting height to the top.

Q40c) Applying a push when he comes down the ramp.

Q40d) The layer of oil will reduce the friction between the skateboard and the ramp. This reduces the amount of energy lost as heat. So more kinetic energy will be converted to gravitational potential energy.

Q41a) Material K. Water travelled the longest distance. Material K absorbed most amount of water.

Q41b) The rod will not bend. This ensures the area of cloth in contact with the water remains the same. Hence only one variable, the material of the strip, is changed.

END