CATHOLIC HIGH SCHOOL

PRELIMINARY EXAMINATION (2022)

PRIMARY SIX

SCIENCE

BOOKLET A

Name: _____ ( )

Class: Primary 6 - _____

Date: 24 August 2022

28 questions

56 marks

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

INSTRUCTIONS TO CANDIDATES

Do not turn over this page until you are told to do so.
Follow all instructions carefully.
Answer all questions.
Shade your answers in the Optical Answer Sheet (OAS) provided.

This booklet consists of 19 printed pages, excluding the cover page.

Booklet A (28 × 2 marks)

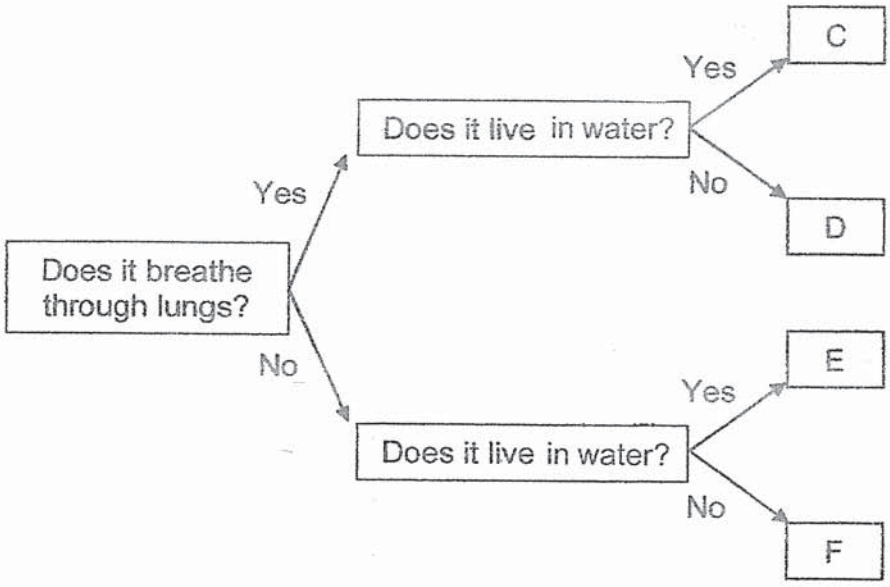
For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). Shade your answer on the Optical Answer Sheet. (56 marks)

1 Which statement(s) about both birds and insects is/are not correct?

A Both have three body parts.
B Both reproduce by laying eggs.
C Both of their young look like the adult.
D Both have the same type of body covering.

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

2 The diagram shows how some living things are grouped.



Which of the following about organisms, C, D, E or F, is correct?

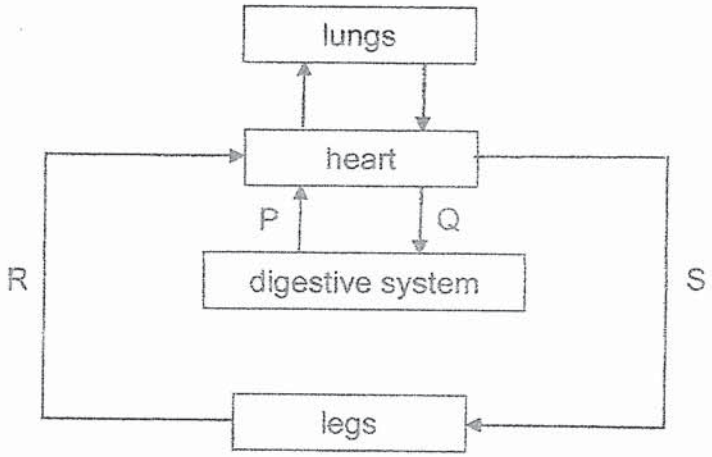
(1) E is a bird.
(2) F is a fish.
(3) C is an insect.
(4) D is a mammal.

3 Which statement(s) about the human respiratory system is/are correct?

A Air enters through the nose.
B It is made up of the nose, windpipe, lungs and heart.
C Only carbon dioxide is released when we breathe out.

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

4 The diagram shows the flow of blood through blood vessels P, Q, R and S.



Which blood vessels transport blood richer in oxygen?

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

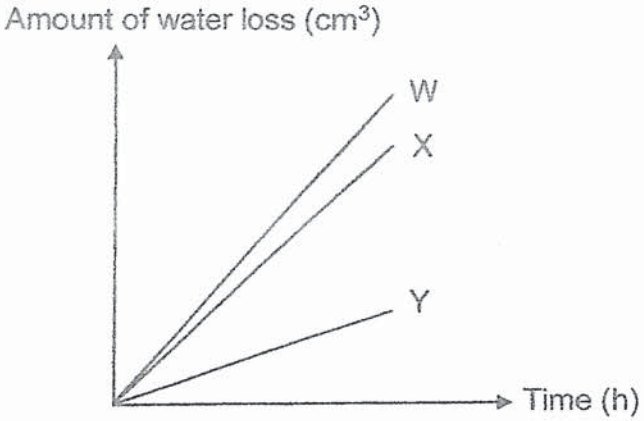
5 Which substances are transported in the transport system of plants?

A food
B water
C oxygen

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

6 Most land plants have more tiny openings found on the lower surface of leaves. Leaves lose water through these tiny openings.

The graph below shows the amount of water loss from three leaves, W, X and Y, of the same land plant placed in a well-ventilated room.



Which of the following correctly identifies the leaves and its surfaces which were coated with oil?

	Upper surface only	Lower surface only	Upper and lower surfaces	None of the surfaces
(1)	X	Y	W	-
(2)	X	Y	-	W
(3)	Y	X	-	W
(4)	-	X	W	Y

7 Rashid observed three different cells, A, B and C, under a microscope and identified them as shown.

A	human cheek cell
B	root cell
C	leaf cell

Which of the following is correct based on Rashid's identification?

(1)

Parts of a cell	A	B	C
nucleus	✓	✓	✓
chloroplast		✓	
cell wall	✓	✓	
cell membrane	✓	✓	✓

(2)

Parts of a cell	A	B	C
nucleus	✓	✓	✓
chloroplast	✓		
cell wall	✓	✓	
cell membrane	✓	✓	✓

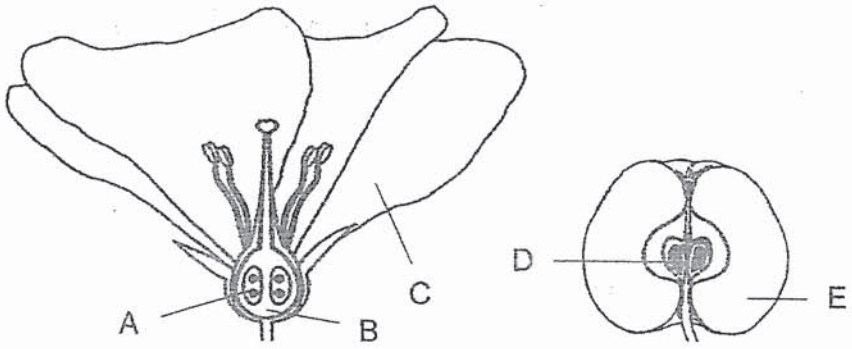
(3)

Parts of a cell	A	B	C
nucleus	✓	✓	✓
chloroplast			✓
cell wall		✓	✓
cell membrane	✓	✓	✓

(4)

Parts of a cell	A	B	C
nucleus	✓	✓	✓
chloroplast		✓	✓
cell wall		✓	✓
cell membrane	✓		✓

8 The diagrams show the cross sections of the parts of a flower and a fruit.



flower fruit

Which statement(s) is/are correct after fertilisation has taken place in the flower?

A Part C wilts and falls off.
B Part A develops into part D.
C Part B develops into part E.

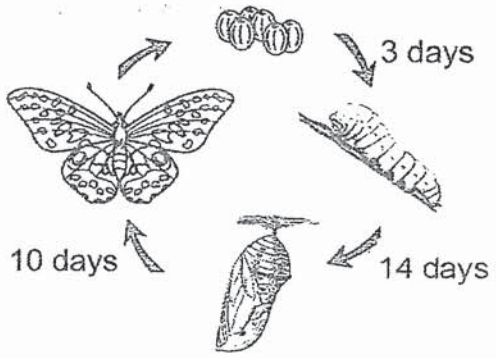
(1) A only
(2) A and B only
(3) B and C only
(4) A, B and C

9 Which statement(s) about photosynthesis is/are correct?

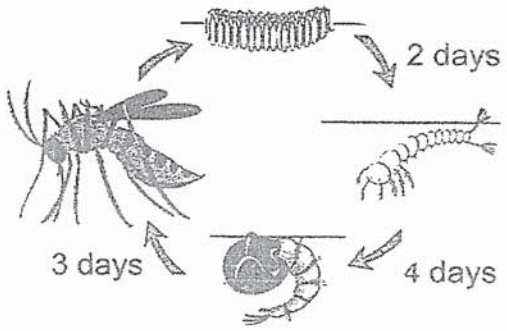
A Plants require only light for photosynthesis.
B Plants convert light energy to potential energy through photosynthesis.
C The rate of photosynthesis in plants increases with higher light intensity.

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

10 The diagrams show the life cycles of two animals, X and Y.



animal X



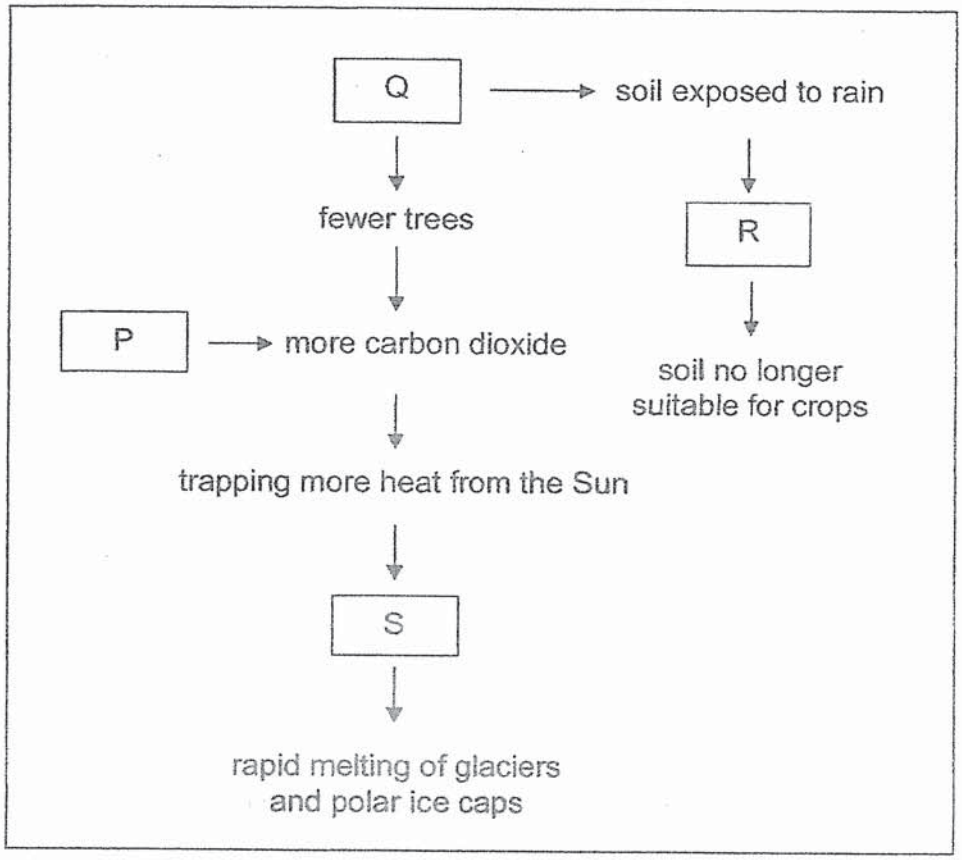
animal Y

Based on the information above, which statement(s) about animals X and Y is/are **not** correct?

A The young of X resembles its adult but the young of Y does not.
B The pupa of X takes a longer time to develop into an adult than Y.
C The young of X only feeds on leaves but the young of Y does not.
D The young of X takes a shorter time to develop into an adult than Y.

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

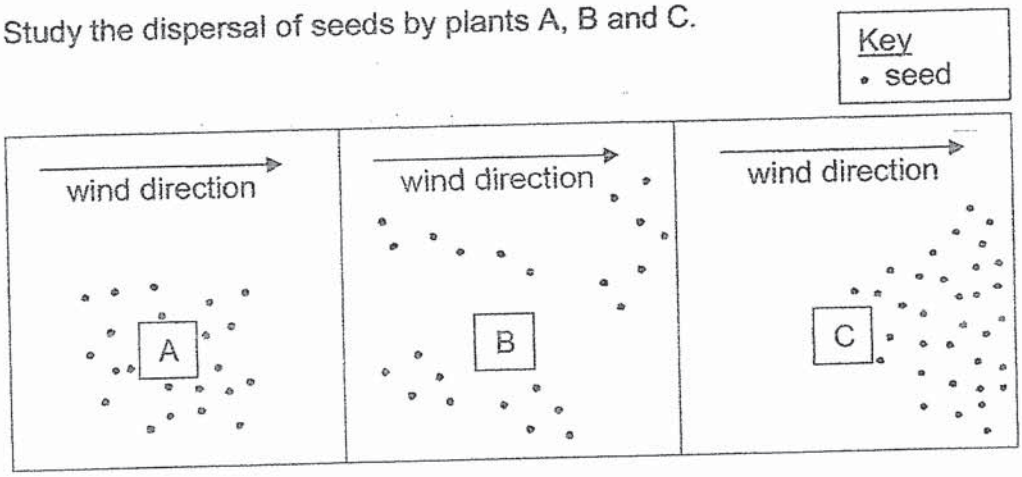
11 The diagram is a representation of Man's activities which can have a negative impact on the environment.



Which of the following best represents P, Q, R and S?

	P	Q	R	S
(1)	deforestation	global warming	burning fossil fuels	soil erosion
(2)	global warming	soil erosion	deforestation	burning fossil fuels
(3)	soil erosion	deforestation	global warming	burning fossil fuels
(4)	burning fossil fuels	deforestation	soil erosion	global warming

12 Study the dispersal of seeds by plants A, B and C.



How were the seeds dispersed?

	A	B	C
(1)	animal	explosive action	wind
(2)	explosive action	animal	wind
(3)	animal	wind	explosive action
(4)	wind	animal	explosive action

13 John wanted to find out how the amount of substance Z added to the soil help plants grow healthily. He used similar potted plants, one of which was a control.

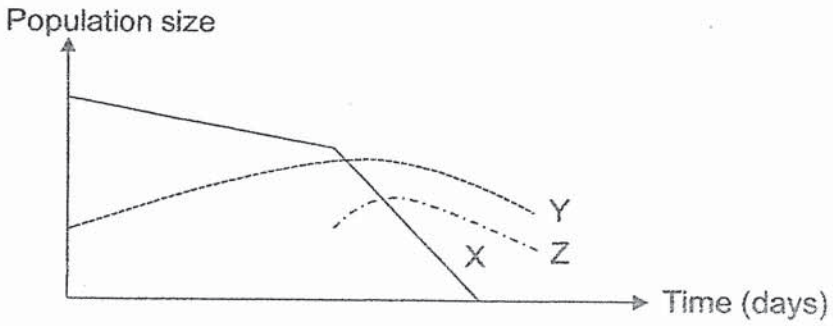
	Pot				
	P	Q	R	S	T
Amount of water given (cm^3)	100	80	100	100	80
Amount of substance Z (g)	10	0	5	0	10
Surrounding temperature (°C)	30	30	30	30	30

Which potted plants did John use for his experiment?

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

14 The graph shows the changes in the population sizes of organisms X, Y and Z.

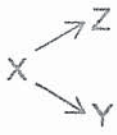
At the start, organisms X and Y were the only living things in a water tank. Organism Z was added into the tank later.

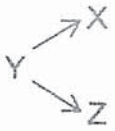


Which of the following correctly shows the food relationship of organisms X, Y and Z?

(1) X → Z → Y

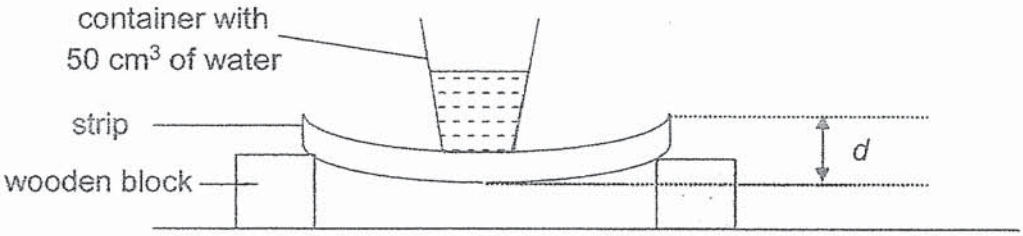
(2) Y → X → Z

(3)


(4)


15 The set-up is used to study a certain property of materials.

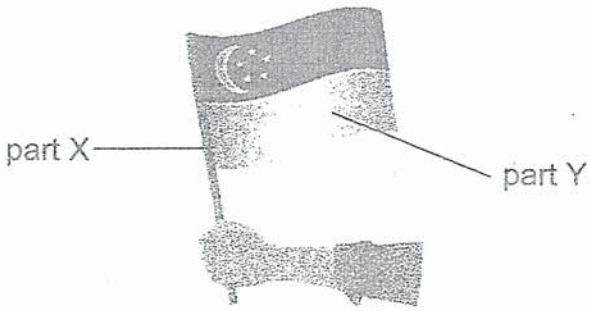
A container with 50 cm^3 of water is placed on similar strips, A, B, C and D, made of different materials.



The distance, *d*, between the highest and lowest point of the strip is measured. The results are as shown.

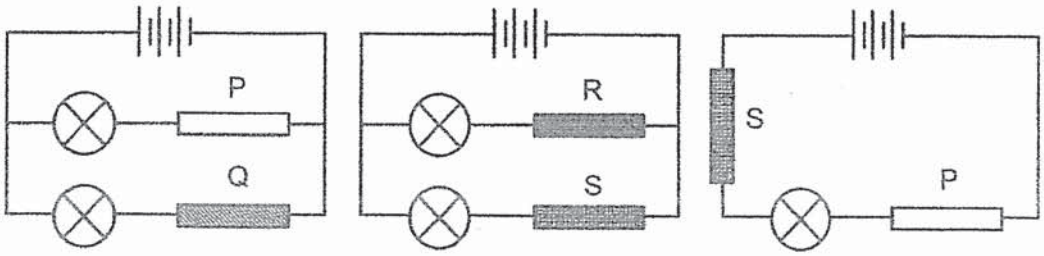
Strip	*d* (mm)
A	36
B	14
C	11
D	1

Based on the results of the study, which material is most suitable to make parts X and Y of a handheld flag?



	Part X	Part Y
(1)	B	C
(2)	D	C
(3)	B	A
(4)	D	A

16 Sally set up three circuits connecting materials P, Q, R and S using identical batteries and bulbs. The batteries and bulbs are in good working condition.



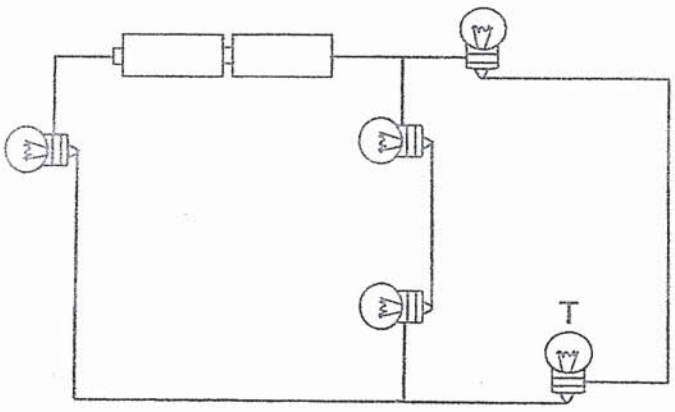
circuit X circuit Y circuit Z

She observed that only bulbs in circuit Y lit up.

Based on her observation, which of the following is correct?

	Electrical conductors	Electrical insulators
(1)	P and Q	R and S
(2)	P and R	Q and S
(3)	Q and R	P and S
(4)	R and S	P and Q

17 Study the circuit below. The batteries and bulbs are in good working condition.



How many bulbs will continue to light up when bulb T fused?

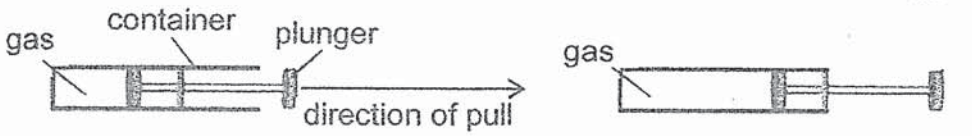
(1) 1

(2) 2

(3) 3

(4) None of the bulbs

18 Some gas was trapped in the container. The plunger was pulled towards the open end of the container as shown.



before the plunger was pulled after the plunger was pulled

How was the volume and mass of the gas in the container affected by the movement of the plunger?

	Volume	Mass
(1)	increased	increased
(2)	increased	remained the same
(3)	decreased	decreased
(4)	remained the same	remained the same

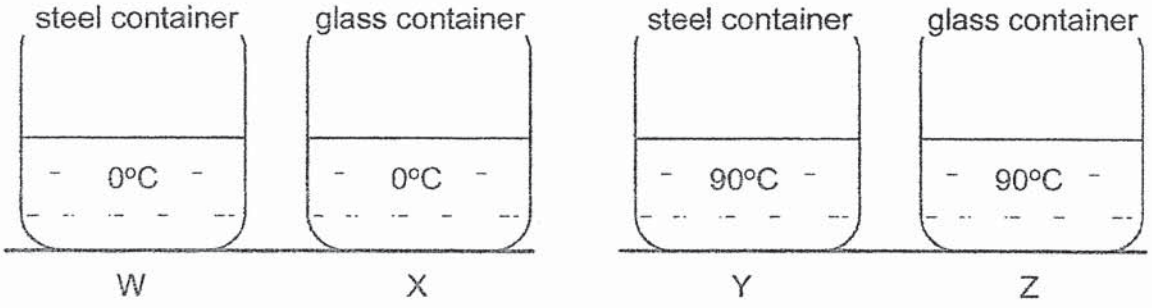
19 The table shows the states of substances, D, E and F, at different temperatures.

Substance	State of substance at		
	30°C	50°C	70°C
D	solid	solid	solid
E	solid	solid	liquid
F	solid	liquid	liquid

Based on the information, which of the following is a correct conclusion?

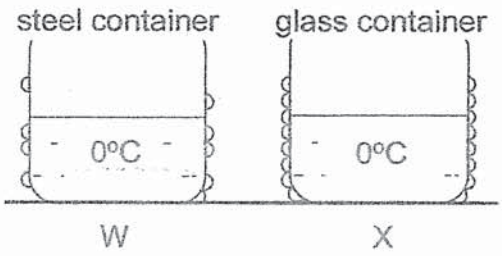
(1) Substance D has the highest melting point.
(2) The boiling point of substances E and F is 70°C.
(3) The melting point of substances E and F is 50°C.
(4) Substance E has a lower boiling point than substance D.

20 Four containers, W, X, Y and Z, made of either steel or glass were set up in a Science Room as shown. The same amount of water was poured into the containers, each of which was of the same thickness, size and shape.

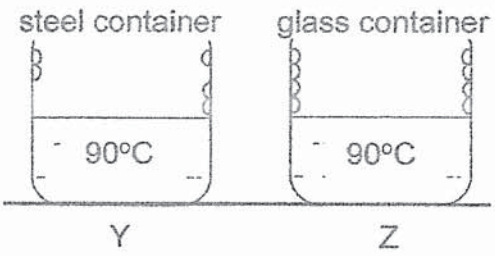


Which of the following correctly show where the water droplets would form after a short while?

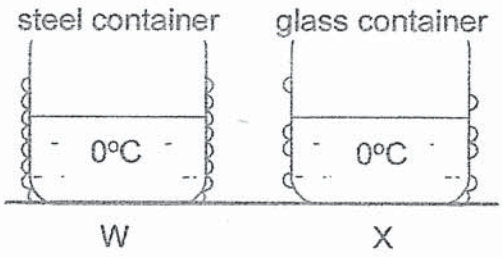
(1)



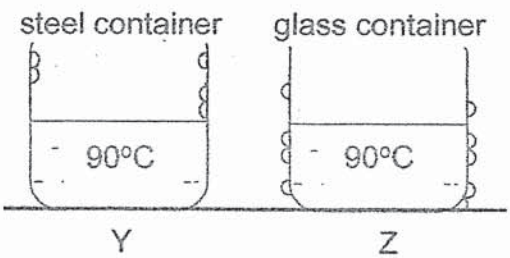
(2)



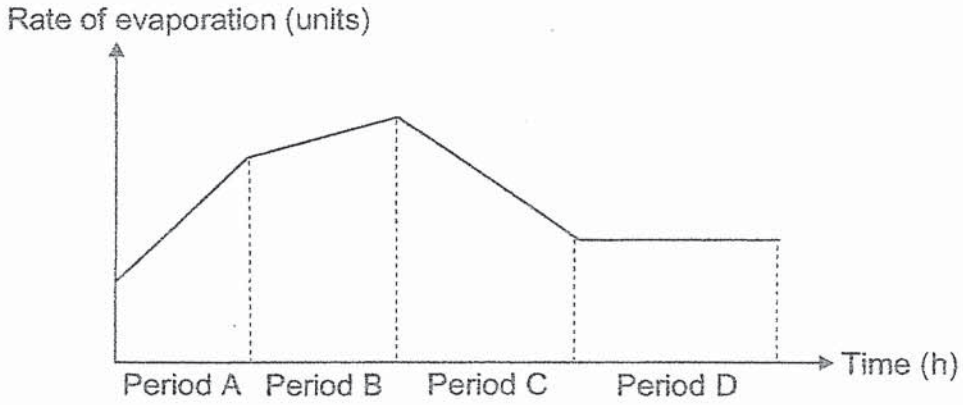
(3)



(4)



21 The graph shows the changes in the rate of evaporation of water in a container over a period of time.

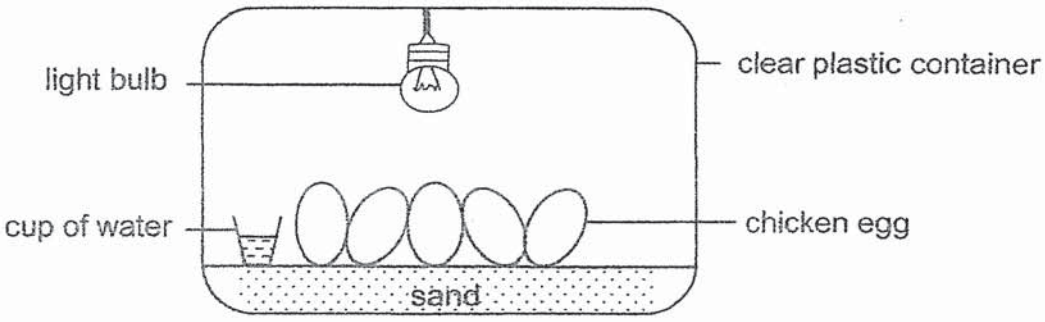


Which is a possible explanation for the change in the rate of evaporation of water?

	Period	Explanation
(1)	A	The amount of water in the container at the start was the most.
(2)	B	There was a decrease in the temperature of the surroundings around the container.
(3)	C	There was a decrease in the exposed surface area of the water when the container of water was partially covered with a lid.
(4)	D	All the water in the container had evaporated.

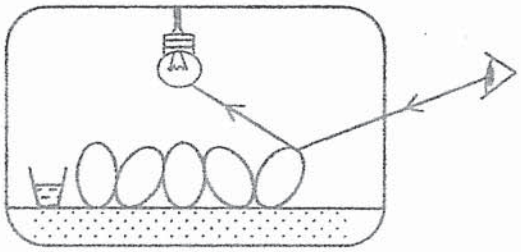
Use the information below to answer questions 22 and 23.

Stephen made a device to hatch some fertilised chicken eggs.

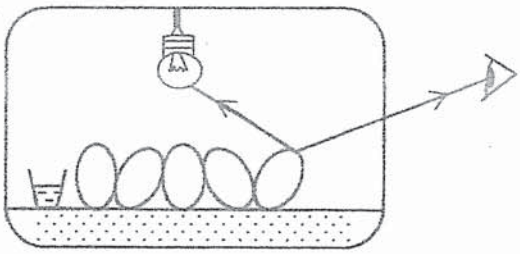


22 Which of the following correctly shows the path of light that allowed Stephen to see the chicken eggs in the container?

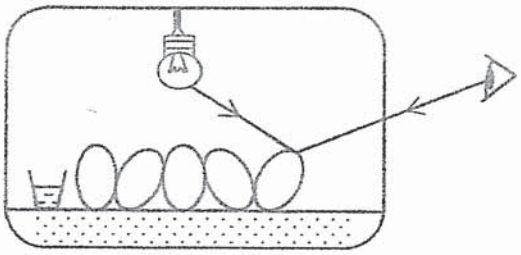
(1)



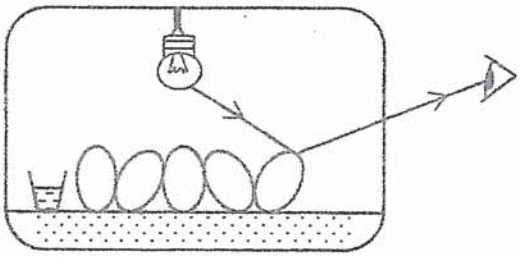
(2)



(3)



(4)



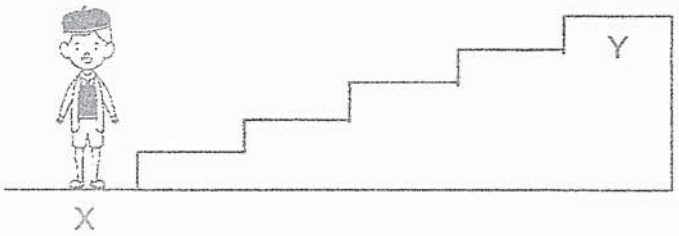
23 Stephen wanted to find out the best temperature for the chicken eggs to hatch.

Which variable(s) should be kept the same?

A volume of container
B number of chicken eggs
C distance between light bulb and chicken eggs

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

24 Ishak stood at point X before running up a flight of stairs from point X to point Y. He stopped once he reached point Y.



Which of the following correctly states the amount of energy Ishak had when he reached point Y compared to point X?

	Potential energy	Kinetic energy
(1)	more than	same as
(2)	more than	more than
(3)	less than	less than
(4)	less than	same as

25 Which of the following is/are **not** a source of energy that can be replaced quickly once they are used up?

A Sun
B Coal
C Wind

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

26 Maisy pushed a toy, which was attached to a spring, into a cup and closed the lid as shown in diagram 1. When she opened the lid, the toy jumped up as shown in diagram 2.

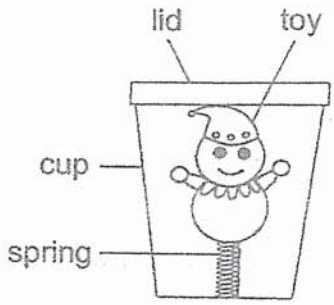


diagram 1

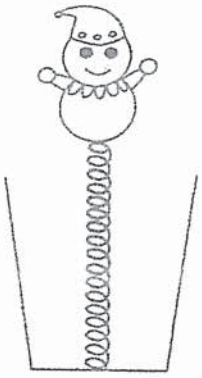


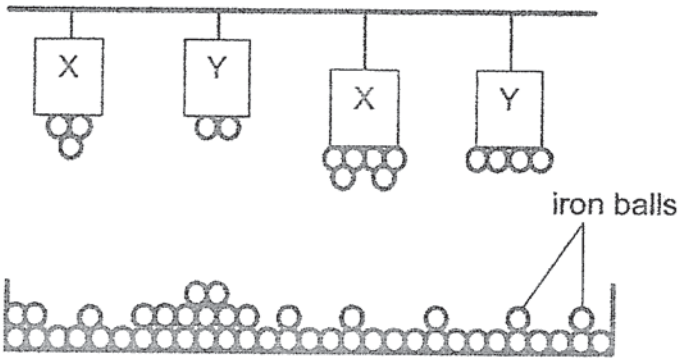
diagram 2

What could Maisy do to make the toy jump higher?

(1) use a taller cup
(2) use a heavier toy
(3) use oil to coat the spring
(4) use a spring that is less stiff

27 Simone used similar-sized iron balls and magnets made of materials X and Y in the set-up to confirm her claims about magnetic force.

The results are shown in the set-up.

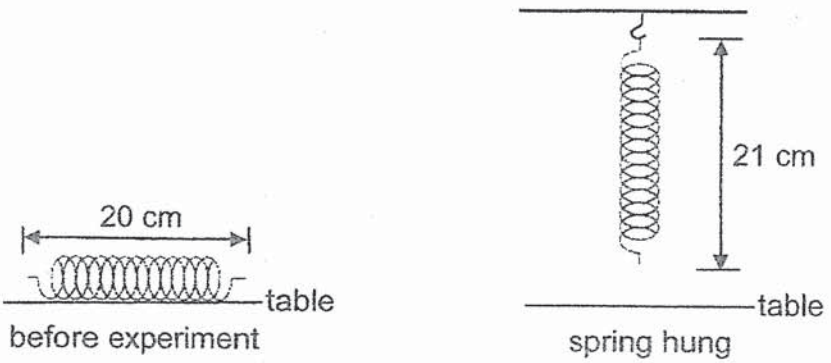


Based on the results, which statement(s) is/are correct?

A A larger magnet has a greater magnetic force than a smaller magnet.
B Only an object made of a magnetic material is attracted to a magnet.
C A magnet made of material X has greater magnetic force than that made of material Y.
D Magnetic force is affected by the distance of the magnet from the object it is to attract.

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

28 A spring of original length, 20 cm, was hung and came to rest as shown in the diagram.



Which statement(s) is/are correct about the spring that was hung?

A Gravitational force had caused the spring to extend.
B There was more gravitational force acting on the spring.
C There was less elastic spring force in the spring that was hung than the one before the experiment.

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

End of Booklet A

CATHOLIC HIGH SCHOOL

PRELIMINARY EXAMINATION (2022)

PRIMARY SIX

SCIENCE

BOOKLET B

Name: _____ ( )

Class: Primary 6 - _____

Date: 24 August 2022

Parent's Signature: _____

Booklet A	56
Booklet B	44
Total	100

12 questions

44 marks

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

INSTRUCTIONS TO CANDIDATES

Do not turn over this page until you are told to do so.
Follow all instructions carefully.
Answer all questions.
Write your answers in this booklet.

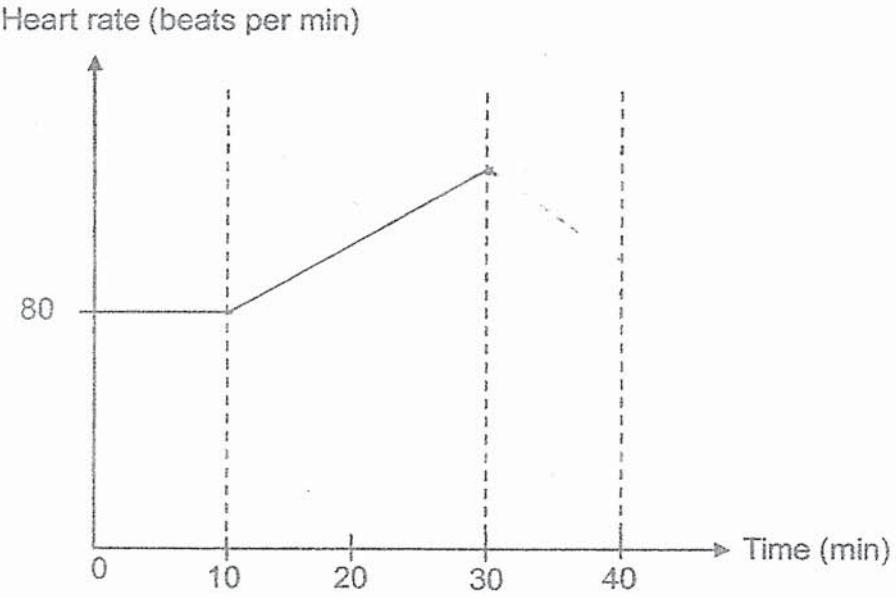
This booklet consists of 18 printed pages, excluding the cover page.

Booklet B (44 marks)

For questions 29 to 40, write your answers in this booklet.
The number of marks available is shown in brackets [ ] at the end of each question or part question. (44 marks)

29 Muthu started to walk slowly for the first 10 minutes of his exercise routine. For the next 20 minutes, he ran continuously. In the last 10 minutes, he walked slowly again.

(a) The heart rate for the first 10 minutes has been drawn.
Complete the graph to show how Muthu's heart rate changes during his exercise routine of 40 minutes. [1]



(b) Other than oxygen, state one other substance that must be supplied faster to his legs to provide him with energy to run continuously. [1]

_____

(c) While Muthu was running, describe how carbon dioxide produced by his body was released into the environment. [2]

_____

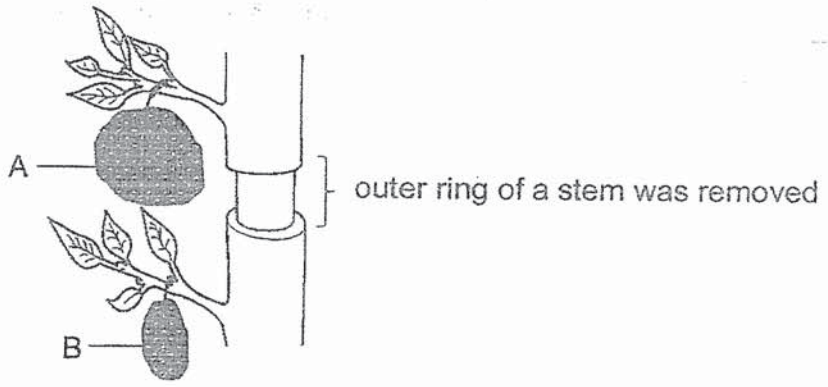
_____

_____

(Go on to the next page)

SCORE	/ 4

30 Ming En removed the outer ring of a stem from a potted plant as shown.



A few weeks later, Ming En observed that the size of fruits A and B were different.

(a) Identify the part of the stem that was removed. [1]

_____

(b) Explain why there was a difference in the size of fruits A and B. [2]

_____

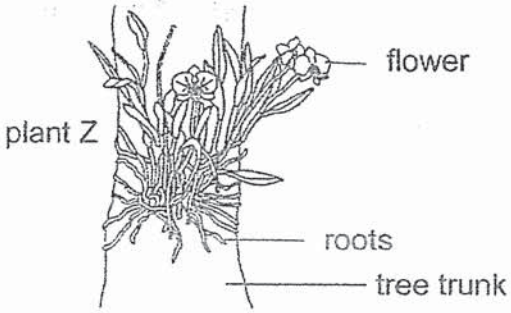
_____

_____

(Go on to the next page)

SCORE	/ 3

31 The roots of plant Z are green and contain chlorophyll.

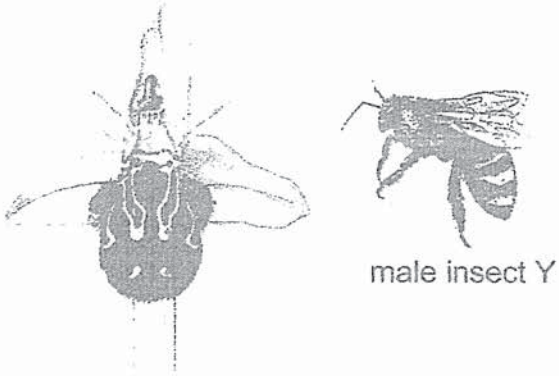


(a) Explain why chlorophyll is found in the roots. [1]

_____

_____

The flower of plant Z does not produce nectar but looks like female insect Y to attract its pollinator, male insect Y.



flower of plant Z

(b) Explain why looking like female insect Y is an advantage to the flower of plant Z. [1]

_____

_____

(Go on to the next page)

SCORE	2

Continue from Question 31

(c) Other than the method used in (b) to attract pollinators, many flowers still produce nectar.

Explain why it is more beneficial to produce nectar to attract pollinators. [1]

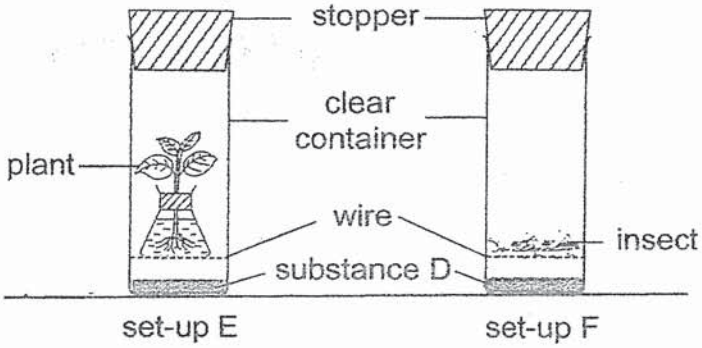
_____

_____

(Go on to the next page)

SCORE	/ 1

32 Both set-ups E and F were left near a lamp in a classroom.



At the start, the colour of substance D in both set-ups were red. The colour of substance D will change from red to yellow with an increase in amount of carbon dioxide.

(a) What is the colour of substance D in each of the set-up three hours later? [1]

Set-up	Colour of substance D
E	
F	

(b) Explain your choice of colour of substance D in set-up E in (a). [1]

_____

_____

(c) How does using a similar size container for both set-ups ensure a fair test? [1]

_____

_____

(d) Suggest a control set-up for the experiment. [1]

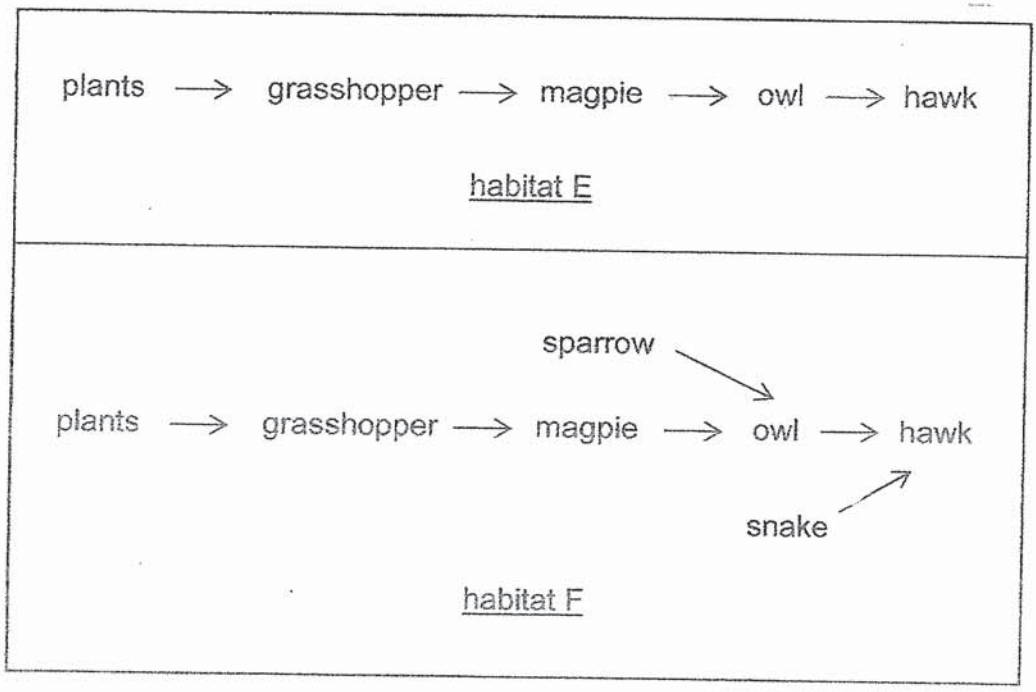
_____

_____

(Go on to the next page)

SCORE 4

33 The diagrams show the food relationships among the organisms in two habitats.



Magpies are birds which can be killed by a disease-causing virus.

(a) If this happens, in which habitat, E or F, will the population of hawks be affected less? Explain why. [2]

_____

_____

_____

(b) Give a reason why deforestation can cause a decrease in the population size of many kinds of animals. [1]

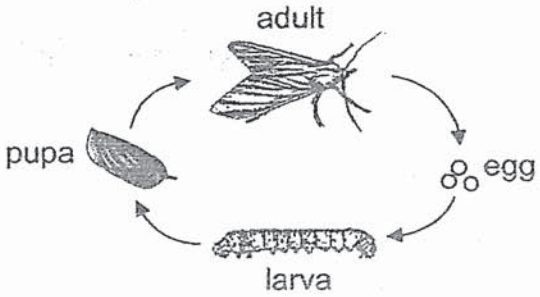
_____

_____

(Go on to the next page)

SCORE	3

34 The diagram shows the life cycle of organism G.



(a) Organism G is classified as an insect.

State one characteristic of the adult that helped classify organism G as an insect. [1]

_____

Organism H is a mammal that feeds on plants found in the trees of the rainforest.

organism H

The statements, which are in order of sequence, describe the behaviours of organisms G and H:

- H climbs down to pass out its droppings in a hole it digs at the foot of the tree
- female adults of G that lives on the body of H fly towards the droppings to lay their eggs
- H covers its droppings with leaves and branches

(b) Explain how these behaviours ensure the survival of organism G. [2]

_____

_____

_____

(Go on to the next page)

SCORE	3

Continue from Question 34

The hair of organism H appears green as a green plant-like organism grows on it.

(c) Suggest how the green plant-like organism is a benefit to organism H. [1]

_____

_____

Organism H has a digestive system similar to that of a human.

Organism H loses a quarter of its body weight when it passes out its droppings because one part of its digestive system is larger than the same part in a human.

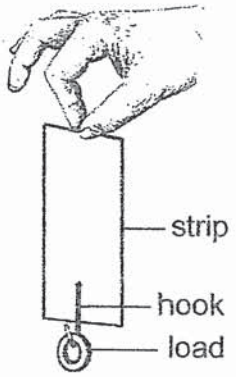
(d) Name the part of the digestive system of organism H. [1]

_____

(Go on to the next page)

SCORE	/ 2

35 Rashid used the set-up to study a certain property of material.



In his study, he used strips made of different materials, P, Q and R. He hung loads of equal mass until each strip tore. The table shows his results.

Material	Number of loads when strip tore
P	3
Q	2
R	5

(a) State the property of material that Rashid studied. [1]

_____

(b) Based on the results, which material, P, Q or R, is most suitable to be used as grocery bags? Give a reason. [1]

_____

_____

(c) Other than the size and thickness of each strip, state two variables Rashid needed to keep constant for the study. [1]

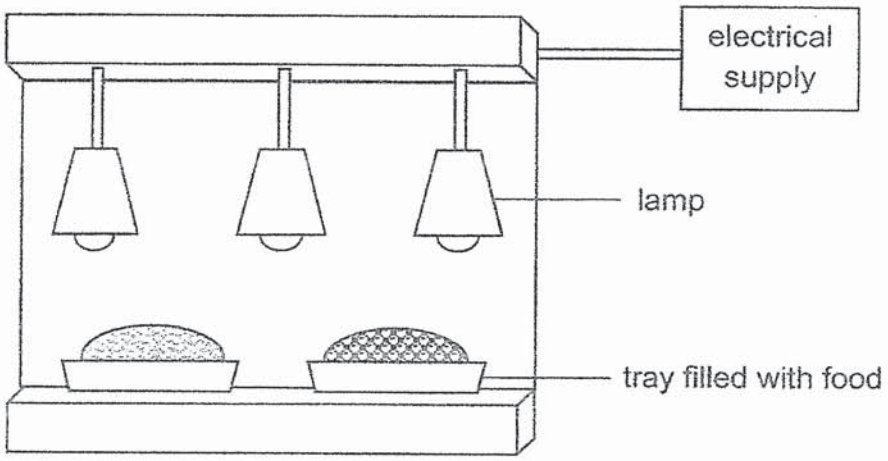
(i) _____

(ii) _____

(Go on to the next page)

SCORE 3

36 The diagram shows a set-up used to keep food warm in an air-conditioned room. When the lamps are turned on, they become hot to keep the food warm.



(a) How does heat given off by the lamp keep the food warm? [1]

_____

_____

(b) What does this set-up tell you about heat transfer? [1]

_____

_____

(c) The tray that is filled with food is made of ceramic.

How does ceramic help to keep the food warm for long period of time? [1]

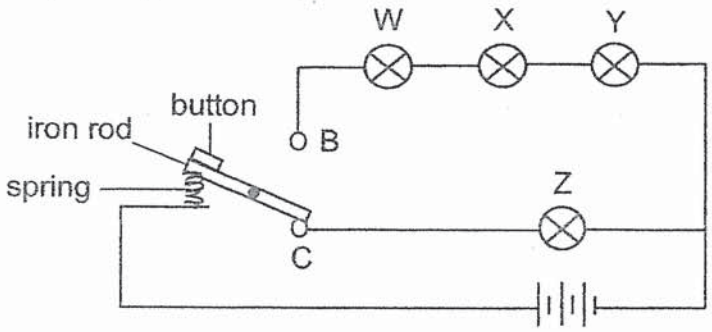
_____

_____

(Go on to the next page)

SCORE	/ 3

37 Jonathan sets up the following circuit as shown. All the bulbs and batteries used are in working condition.



Before the button is pressed, the iron rod is in contact with point C. When the button is pressed, the iron rod swings upwards and comes in contact with point B.

(a) How many bulb(s) remain unlit before the button is pressed? [1]

_____

(b) Explain why none of the bulbs lights up when a plastic rod is used. [1]

_____

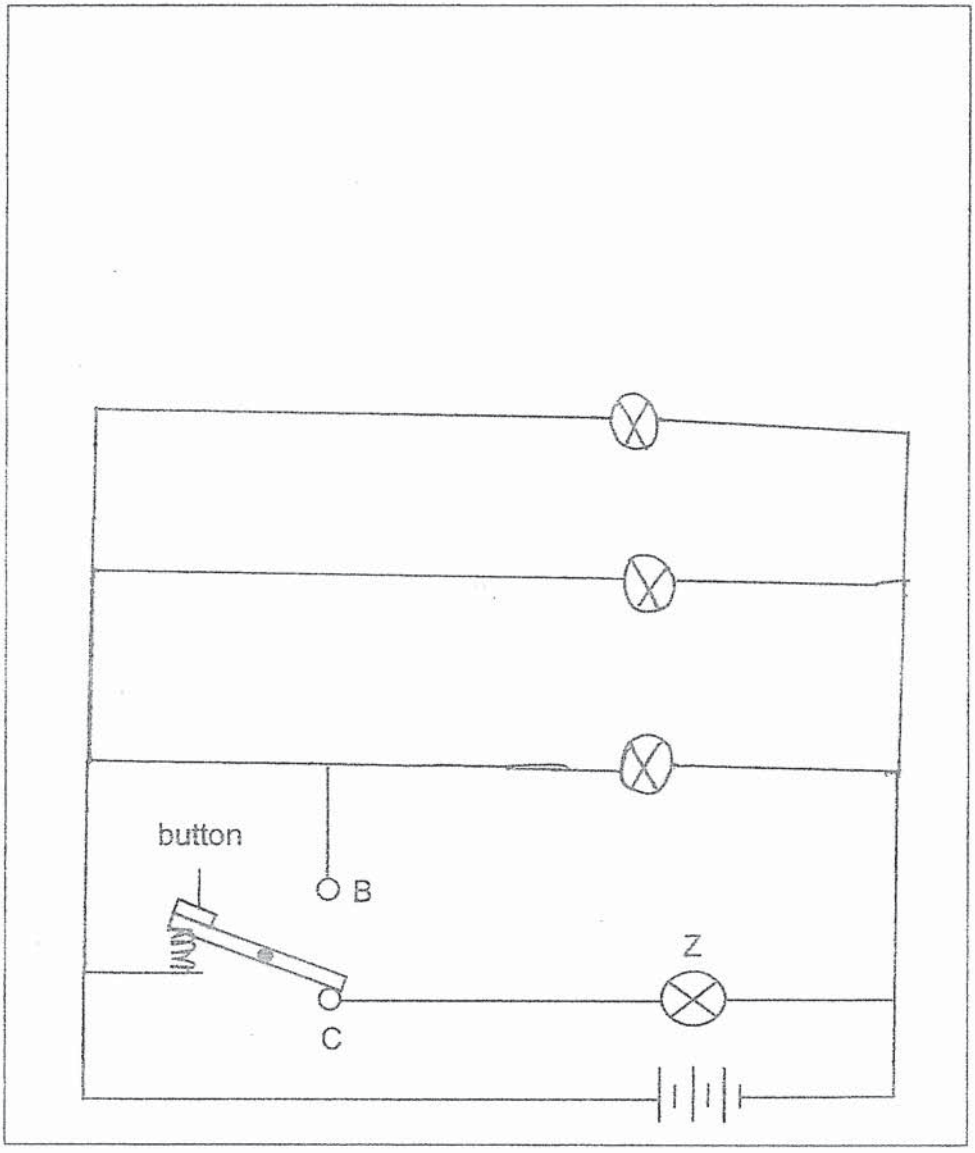
_____

(Go on to the next page)

SCORE	2

(c) Complete the circuit diagram to show how bulbs, W, X and Y, should be rearranged so that each bulb will light up with the same brightness as bulb Z before the button is pressed.

Label the bulbs. [2]

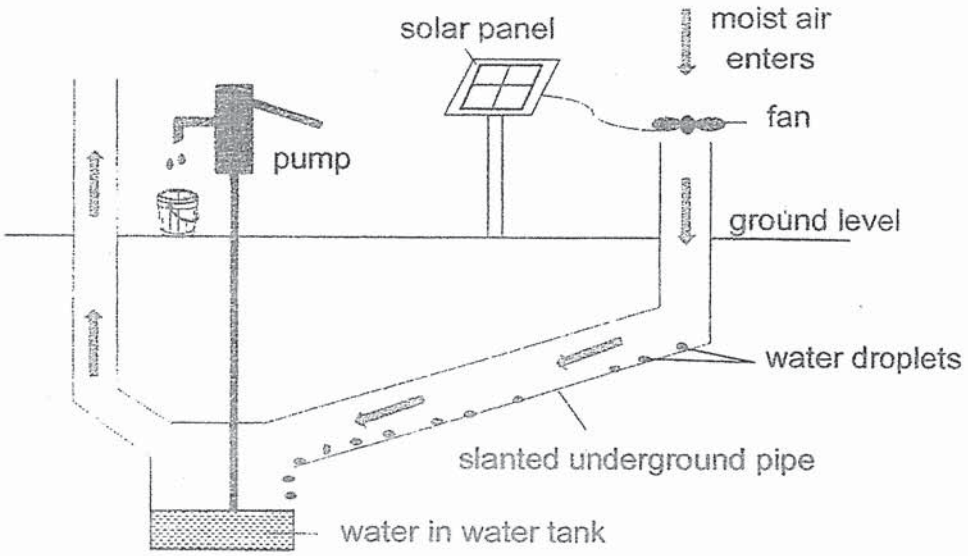


(Go on to the next page)

SCORE	/ 2

38 The method as shown is used to obtain water from the surrounding air.

The solar panel powers the fan that is attached to it. The surrounding air is drawn in underground through the opening when the fan rotates. Water is obtained with the help of the pump attached.



The temperature of the surrounding air above the ground ranges from 18°C to 41°C while the temperature underground ranges from 7°C to 16°C.

(a) Explain how water can be obtained from the air that passes through the underground pipe to be collected in the water tank. [1]

_____

_____

(Go on to the next page)

SCORE	1

Continue from Question 38

One way to collect more water using this method is to pass more air through the opening.

(b) Suggest two other changes to collect more water over a fixed period of time. [2]

(i) _____

_____

(ii) _____

_____

(c) Explain how global warming leads to the lack of water resources. [1]

_____

_____

(Go on to the next page)

SCORE	/ 3

39 Rahim made a device to drive a nail into a wooden plank as shown in diagrams 1, 2 and 3.

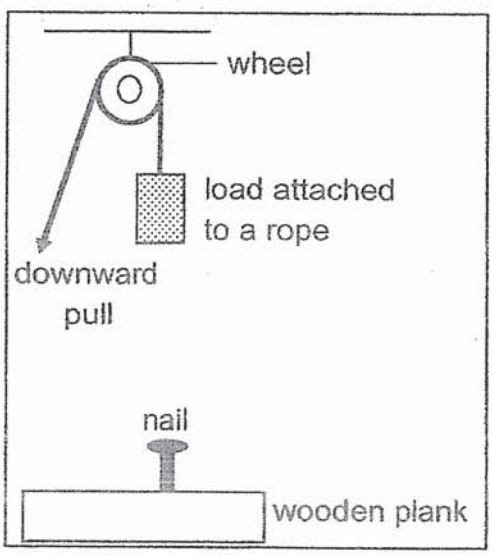


diagram 1

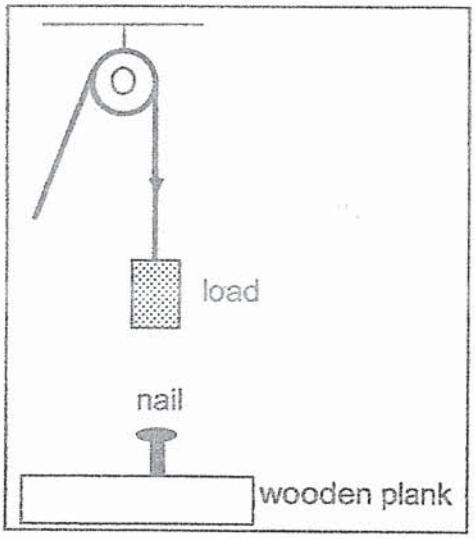


diagram 2

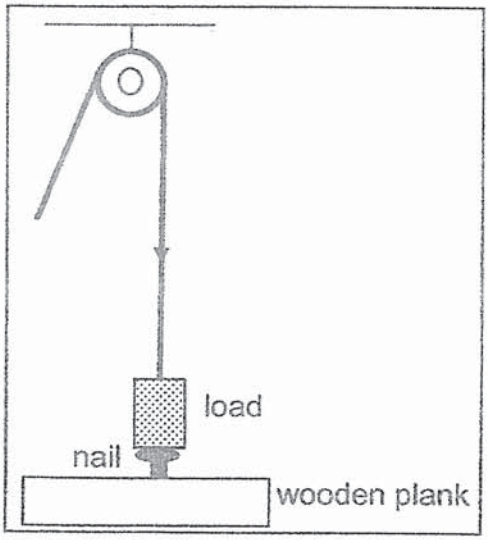
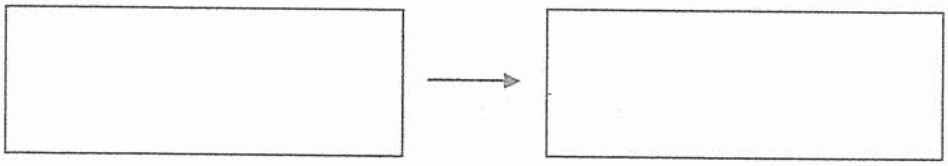


diagram 3

(a) Fill in the boxes provided to show the conversion of energy in the load in diagrams 1 and 2. [1]



(load in diagram 1) (load in diagram 2)

(Go on to the next page)

SCORE	1

Continue from Question 39

(b) In order to drive the nail deeper into the wooden plank, would the following suggestions work?

Circle 'Yes' or 'No' to indicate your choice.
Explain your choice in terms of energy conversion. [2]

(i) Suggestion 1: Increase the mass of the load

Yes / No

Explanation: _____

_____

_____

(ii) Suggestion 2: Increase the distance between the wheel and load

Yes / No

Explanation: _____

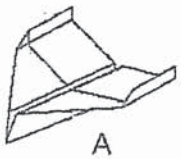
_____

_____

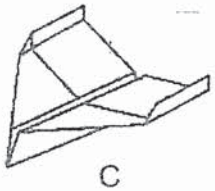
(Go on to the next page)

SCORE	/ 2

40 Aishah conducted an experiment using three identical pieces of paper. She made three similar planes, A, B and C, of different sizes.


A

B


C

An electric paper plane launcher was used to throw each plane in the same direction. The time taken for it to reach the ground was measured and recorded as shown.

Plane	Wingspan of paper plane (cm)	Time taken for paper plane to fall to ground (s)
A	4	20
B	3	18
C	5	25

(a) State the force acting on the paper plane when it was in the air. [1]

_____

(b) Suggest how using an electric paper plane launcher allowed for a fair test. [1]

_____

_____

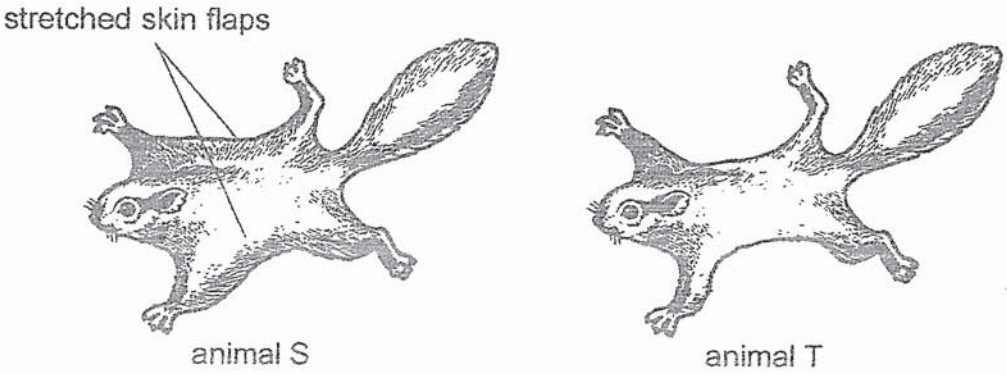
(Go on to the next page)

SCORE	/ 2

Continue from Question 40

Study the features of two similar-sized animals, S and T.

Animal S is able to glide in the air or land on tree branches by adjusting how much it stretches its skin flaps.



(c) Based on the results of Aishah's experiment, explain why animal S takes a longer time to land on a tree branch. [1]

_____

_____

(d) Using the findings from the experiment, suggest two advantages of having a stretched skin flap when animal S leaps from trees. [2]

Advantage 1: _____

_____

Advantage 2: _____

_____

End of Booklet B

SCORE	/ 3

YEAR : 2022
LEVEL : PRIMARY 6
SCHOOL : CATHOLIC HIGH SCHOOL
SUBJECT : SCIENCE
TERM : PRELIMINARY EXAMINATION

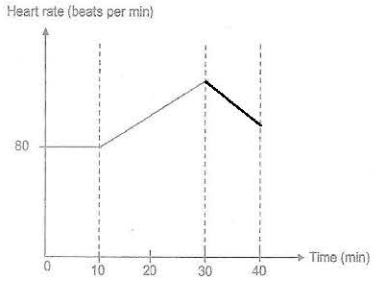
(BOOKLET A)

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

(BOOKLET B)

Q29

a)



b) Digested food

c) When Muthu ran, carbon dioxide produced by his body was transported in his blood which is then pumped by the heart to his lungs. Carbon dioxide travelled through his windpipe and is breathed out through his nose releasing it into the environment.

Q30

a) Food-carrying tubes

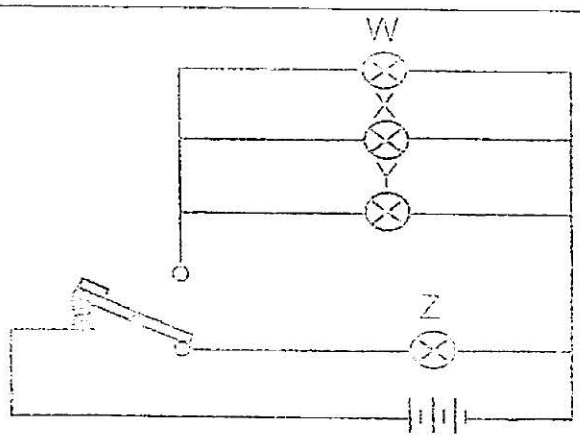
b) Since the food carrying tube were removed, food made by the leaves could not be transported to the part of the plant below the cut stem. Thus, more food was transported to fruit A and stored there, resulting in bigger fruit A than B.

Q31

a) To allow the plant to trap more sunlight to photosynthesis more to make more food.

b) The flower has petals that attracts insect Y, therefore the flower of plant Z would have a higher chance to be pollinated by male insects Y

c) Nectar can attract more pollinators than the method used in (b). Plants produce nectar to attract pollinators. As the pollinator moves from flower to flower collecting nectar, they are also moving pollen from flower to flower.

Q32	a)	E : red F : yellow
	b)	As the plant has water and light, it can photosynthesis which it will take in carbon dioxide and give out oxygen.
Q33	a)	Habitat F as even if the magpie die out, the owl would still have another source of food, thus its population would remain the same, since there is enough food to eat, the hawk would be able to feed on both the owl and the snake.
	b)	Deforestation cuts away the habitat which is essential for animal that lives in a forest, thus it will have lesser food and no shelter, thus its population size would die decrease.
Q34	a)	Organism G has three pair of legs
	b) The droppings of H is a source of food for the young of Organism G and the leaves and branches would provide as shelter for the young of organism G. H climbs down to pass out its dropping in a hole it digs at the foot of the tree as the droppings can be a fertiliser to the tree. c) The green plant-like organism allows organism H to be able to blend it with surroundings and camouflage itself so that it would not be spotted by predators. d) large instestine	
Q35	a) The strength of the material. b) Material R. It took the most number of loads before it tore, thus it would be able to hold the most amount of weight. c) (i) The number of strips (ii) Number of loads	
Q36	a) The tray filled with food would gain heat from the heat given off by the lamp. b) the heat from the lamp is transferred to the food causing it to stay warm c) Ceramic is a bad conducter of heat, therefore causing it to lose heat slower	
Q37	a) Three bulb b) Since the plastic rod is not an electrical conductor, it would not allow electrical currents to flow through thus, the circuit would be opened, electric currents would not be able to flow through the light bulbs.	
	c)	
Q38	a) The moist air that enters has warm water vapour, thus when it touches	

		the cooler surface of the underground pipe it, it would lose heat and condense to form water droplets which would then be collected in the water tank.
	b)	(i) Increase the fan speed (ii) Pipes to be built deeper into grounder
	c)	As the surrounding air temperature increases, water from the rivers and lakes evaporate faster.

Q39	a)	(gravitational) potential energy → kinetic energy
	b)	(i) Yes There will be more gravitational potential energy to be converted to more kinetic energy in the load to drive the nail deeper into the wooden plank. (ii) No There will be less gravitational potential energy to be converted to less kinetic energy in the load so the nail will not be driven into the woonden plank.
Q40	a) b) c) d)	Gravitational Force It ensures the same amount of force is exerted on each plane As the wingspan of skin flap increases, the time animal S takes to stay in the air increases. Advantage 1: It allows Animal S more time in the air to look for food at where it lands. Advantage 2: There is less impact when animal S lands minimising injury.

Q32 c) It ensure that both containers would contain the same amount of carbon dioxide.
Q32 d) The same set-up as set-up E but without the plant.

END