Anglo-Chinese School
(Primary)
A Methodist Institution
(Founded 1886)

PRELIMINARY EXAMINATION 2023
SCIENCE
PRIMARY SIX
BOOKLET A

Name: _____ **Class: Primary 6** ___

Date: 23 August 2023 **Total Time for Booklets A and B: 1 h 45 min**

Additional Materials: Optical Answer Sheet (OAS)

INSTRUCTIONS TO CANDIDATES

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

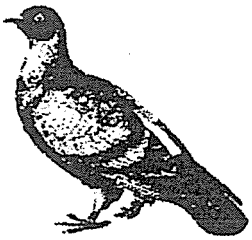
This booklet consists of 20 printed pages including this cover page.

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

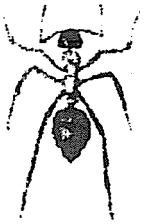
(56 marks)

---

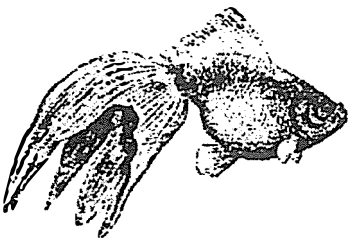
1 The diagrams show three animals with a common characteristic.



Animal A



Animal B



Animal C

In what way is these three animals similar?

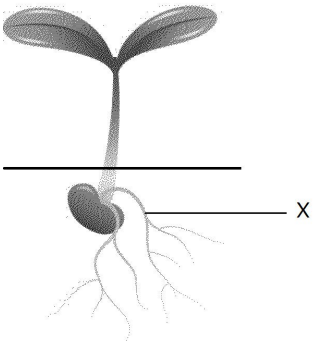
(1) The way they move.

(2) The way they breathe.

(3) The way they reproduce.

(4) Their outer body covering.

2 The diagram shows a seedling that grows in the soil.



What is the function of the part labelled X?

(1) It protects the seedling.

(2) It removes food from the seedling.

(3) It takes in only water for the seedling.

(4) It holds the rest of the seedling onto the soil.

3 Which of the following statements about the digestive system of the human body is true?

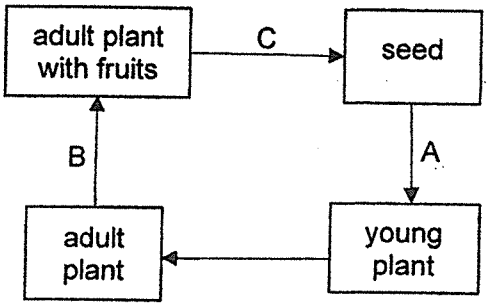
(1) It stores all digested food.

(2) It produces digestive juices.

(3) It absorbs water from digested food.

(4) It works with the circulatory system to digest food.

4 The diagram shows the life cycle of a flowering plant.



What processes do A, B and C represent?

	A	B	C
(1)	dispersal	fertilisation	germination and pollination
(2)	dispersal and fertilisation	pollination	germination
(3)	pollination	germination and fertilisation	dispersal
(4)	germination	pollination and fertilisation	dispersal

5 Which of the two following characteristics cannot be passed on from parents to their young?

A Fingerprint
B Colour of hair
C Length of hair
D Type of ear lobe

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

6 The diagrams show the reproductive systems of a human and a flowering plant.

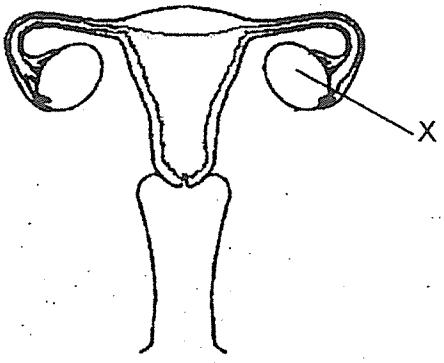


diagram 1

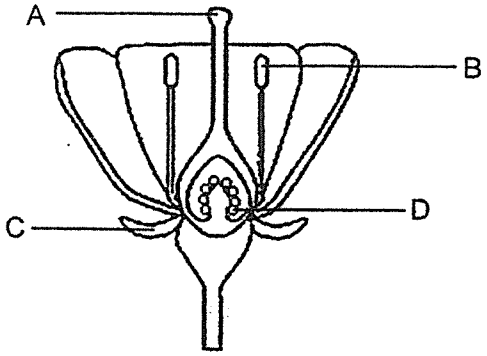
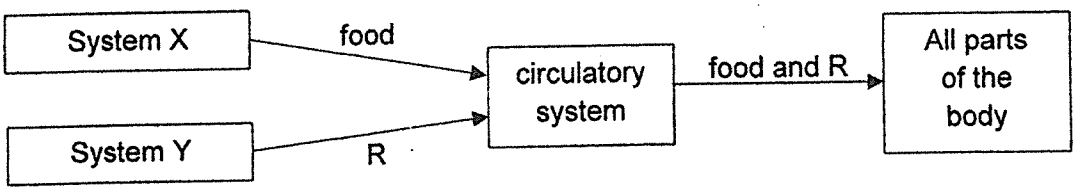


diagram 2

Part X has the same function as part _____.

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

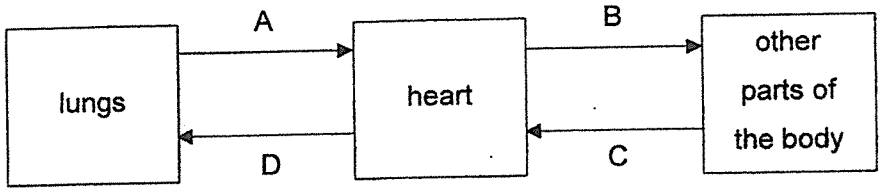
7 The chart shows how food and substance R are transported in the human body.



What are systems X and Y and substance R?

	System X	System Y	Substance R
(1)	digestive system	muscular system	carbon dioxide
(2)	respiratory system	digestive system	oxygen
(3)	muscular system	respiratory system	carbon dioxide
(4)	digestive system	respiratory system	oxygen

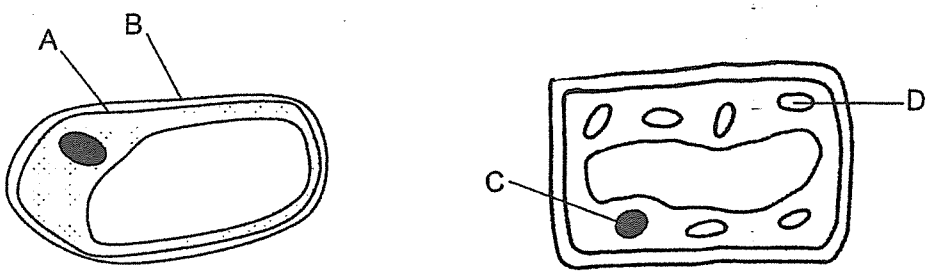
8 The diagram shows the human circulatory system and blood vessels A, B, C and D.



Which of the following shows the correct amount of carbon dioxide in the blood vessels?

	Low in carbon dioxide	High in carbon dioxide
(1)	A and B	C and D
(2)	A and D	B and C
(3)	B and D	A and C
(4)	C and D	A and B

9 The diagrams show two different types of cells from the same plant.



Which of the cell parts A, B, C and D correctly matches its function?

	Gives the cell a regular shape	**Contains the genetic information of the cell**	**Contains chlorophyll**
(1)	A	C	D
(2)	B	D	C
(3)	A	B	D
(4)	B	C	D

10 The food chain as shown represents a food relationship between three organisms, P, Q and R in a pond community. P is a water plant.

P → Q → R

A large population of S is introduced into the pond. S does not have any predators and feeds on Q only.

Which of the following statements about the populations of P, Q, R and S is correct when S is introduced into the pond?

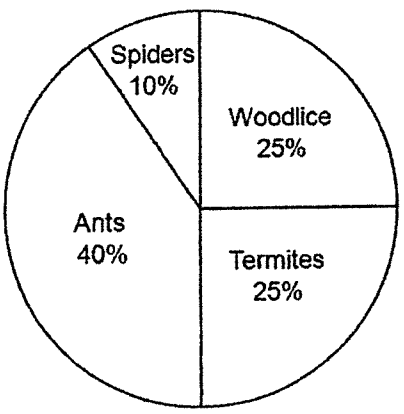
(1) P will decrease.

(2) R will decrease

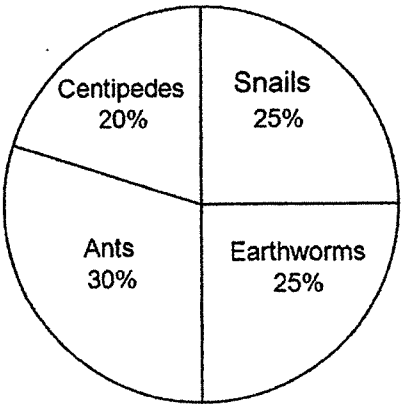
(3) S will decrease.

(4) Q will stay the same.

11 Rita drew two pie charts to represent the types and number of animals she found in a rotting log and a leaf litter community. The number of animals she found in both communities are different.



Rotting Log Community



Leaf Litter Community

Based on the information in the pie charts, which of the following statements is definitely true?

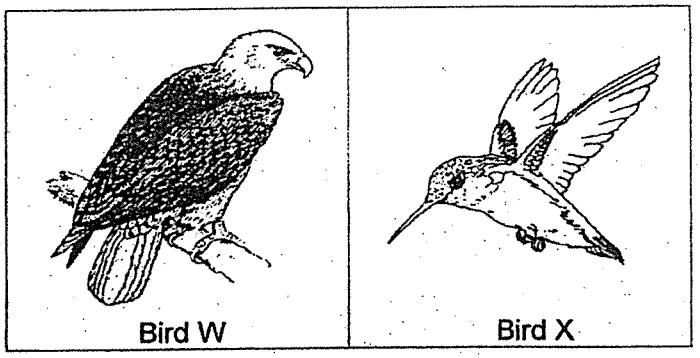
(1) The centipedes in the leaf litter community preyed on the snails.

(2) There were fewer spiders than termites in the rotting log community.

(3) All the organisms in each of the community can form a single food chain.

(4) There were more ants in the rotting log community than the leaf litter community.

12 The diagrams show two birds, W and X.



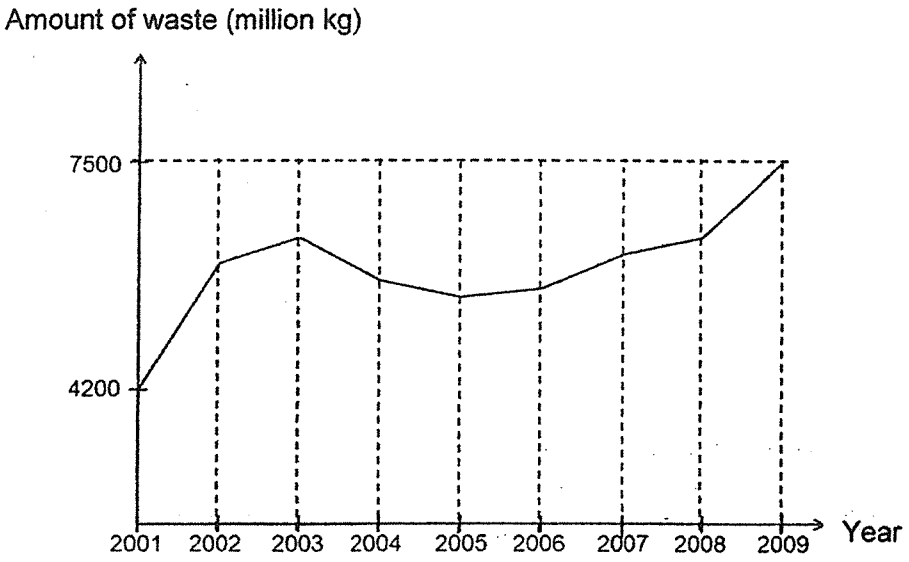
Bird W

Bird X

Based on the diagrams, which of the following is most likely eaten by birds W and X?

	Bird W	**Bird X**
(1)	Fish	Seeds
(2)	Seeds	Nectar
(3)	Nectar	Seeds
(4)	Mouse	Nectar

13 The graph shows the amount of waste disposed by a country from year 2001 to 2009.



Based on the information from the graph, which of the following statements about the amount of waste disposed is true?

(1) It was the least in year 2005.

(2) It increased from year 2005 to 2009.

(3) It decreased from year 2004 to 2007.

(4) It was lesser in the year 2002 than 2001.

14 Ali wanted to find out if the presence of light causes the amount of oxygen to increase.

Which of the following tables should Ali use to carry out his experiment?

(1)

Variables	Set-up A	Set-up B
Amount of soil (cm^3)	60	80
Amount of water (cm^3)	80	100
Amount of light (units)	30	30
Surrounding temperature (°C)	15	25

(2)

Variables	Set-up A	Set-up B
Amount of soil (cm^3)	80	80
Amount of water (cm^3)	100	100
Amount of light (units)	30	0
Surrounding temperature (°C)	25	25

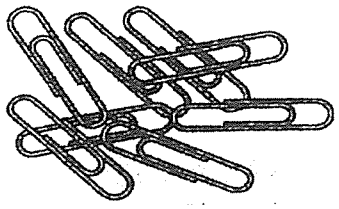
(3)

Variables	Set-up A	Set-up B
Amount of soil (cm^3)	80	80
Amount of water (cm^3)	100	100
Amount of light (units)	0	30
Surrounding temperature (°C)	15	25

(4)

Variables	Set-up A	Set-up B
Amount of soil (cm^3)	80	80
Amount of water (cm^3)	100	100
Amount of light (units)	0	0
Surrounding temperature (°C)	25	15

15 John wanted to compare the strength of four magnets, W, X, Y and Z. He placed the magnets one at a time near to some steel paper clips as shown.



The table shows the number of paper clips that were attracted by the four magnets from different distances.

Magnet	Distance between the magnet and the paper clips (cm)	Number of paper clips attracted
W	2	3
X	2	5
Y	4	7
Z	2	7

Based on the information, which of the following statements about magnets W, X, Y and Z are correct?

A Magnet W is the weakest magnet.

B Magnet X is weaker than magnet Z.

C Magnet Y is stronger than magnet Z.

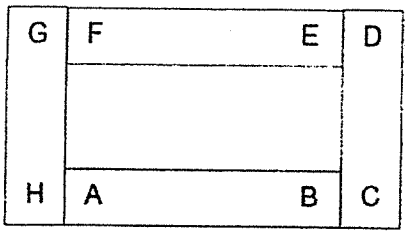
(1) A and B only

(2) A and C only

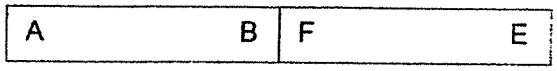
(3) B and C only

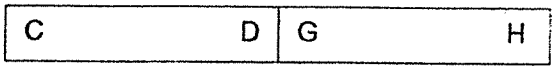
(4) A, B and C

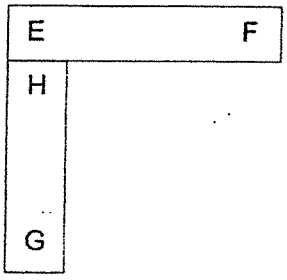
16. The diagram shows how four bar magnets are attracted to one another.

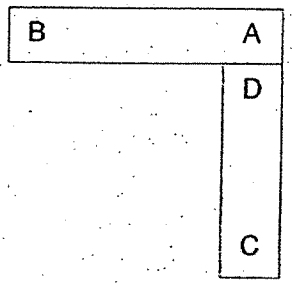


Some pairs of magnets were then brought together as shown. Which of the following arrangements is not possible?

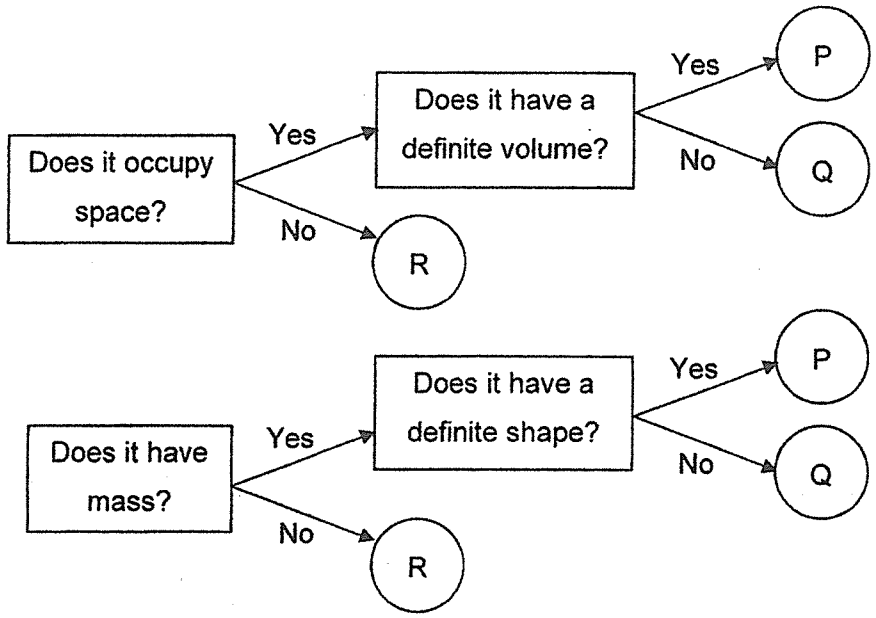
(1) 

(2) 

(3) 

(4) 

17 The chart shows how P, Q and R can be classified.



Which of the following statements is true?

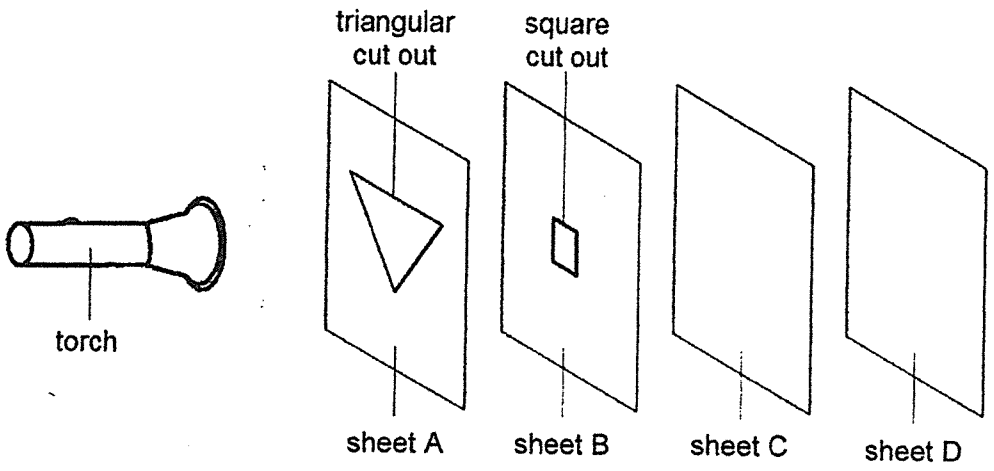
(1) P is a solid.

(2) Q is a liquid.

(3) P and Q are gases.

(4) P, Q and R are matter.

18 Tom wanted to find out if sheets A, B, C and D allowed light to pass through. He conducted the experiment below in a dark room.

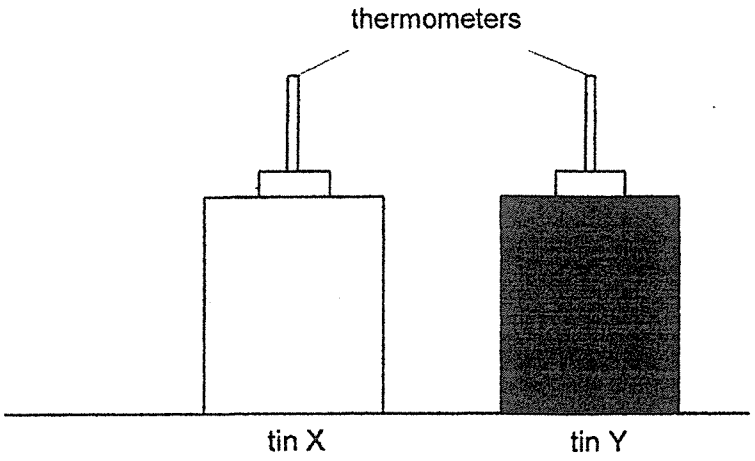


Sheets A, B, C and D were arranged in a straight line. When the torch was switched on, a small, bright square patch of light was seen on sheet D only.

Which of the following shows the correct classification of the sheets?

	Allows light to pass through	**Does not allow light to pass through**	**Not possible to tell**
(1)	C	B and D	A
(2)	A and C	D	B
(3)	B and C	A	D
(4)	B and D	C	A

19 Ari placed two identical tins under the hot sun. The surface of tin X was painted white and the surface of tin Y was painted black as shown.



The readings on the thermometers were taken every five minutes and the results are shown in the table.

	Temperature of tin (°C)	
Time (min)	**X**	**Y**
0	25	25
5	26	27
10	27	30
15	28	34

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

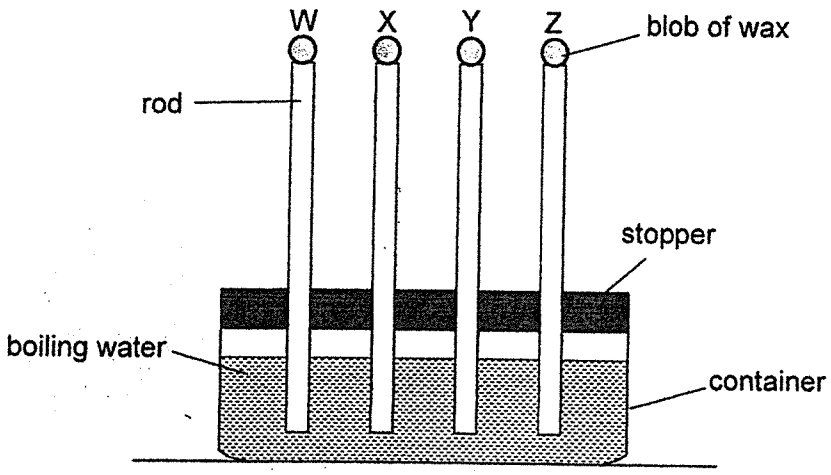
(1) Tin X loses heat faster than the tin Y.

(2) The tin Y absorbs heat faster than the tin X.

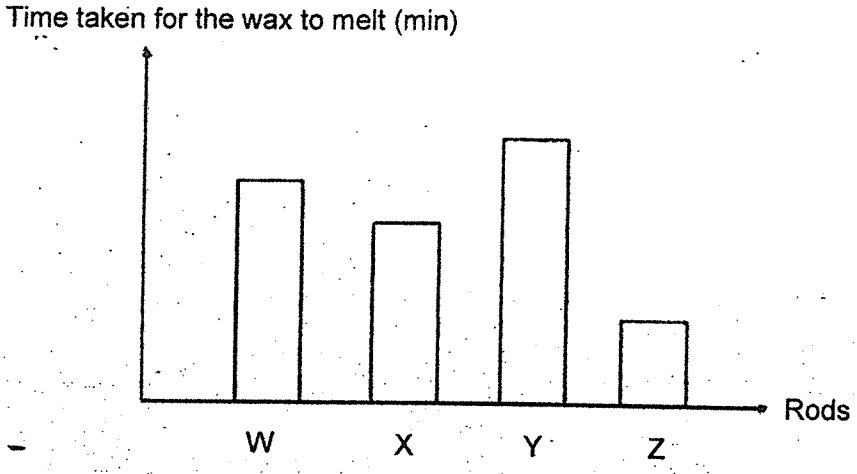
(3) The tin Y is a poorer conductor of heat than the tin X.

(4) Both tins will gain heat until they reach the same temperature as the surroundings.

20 Benny set up an experiment as shown.



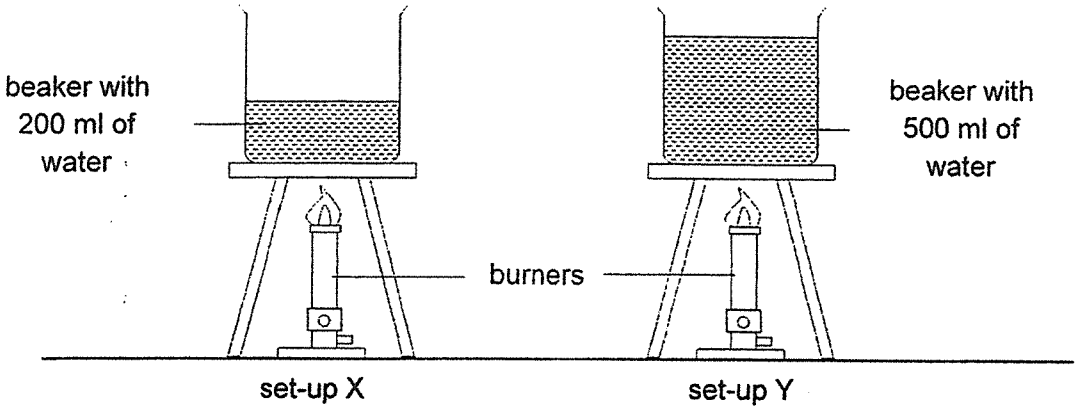
All the rods were of the same size but made of different materials. He placed the same amount of wax on the tip of each rod and poured boiling water into the container as shown. He recorded the time taken for the wax to fall off each rod. The results are shown in the graph.



Which of the rods is the most suitable for making ice boxes to store ice so that the ice will take the longest time to melt?

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

21 An experiment is set up as shown using similar beakers and burners.



The experiment was stopped after 15 minutes. Which of the following statements are true about the experiment?

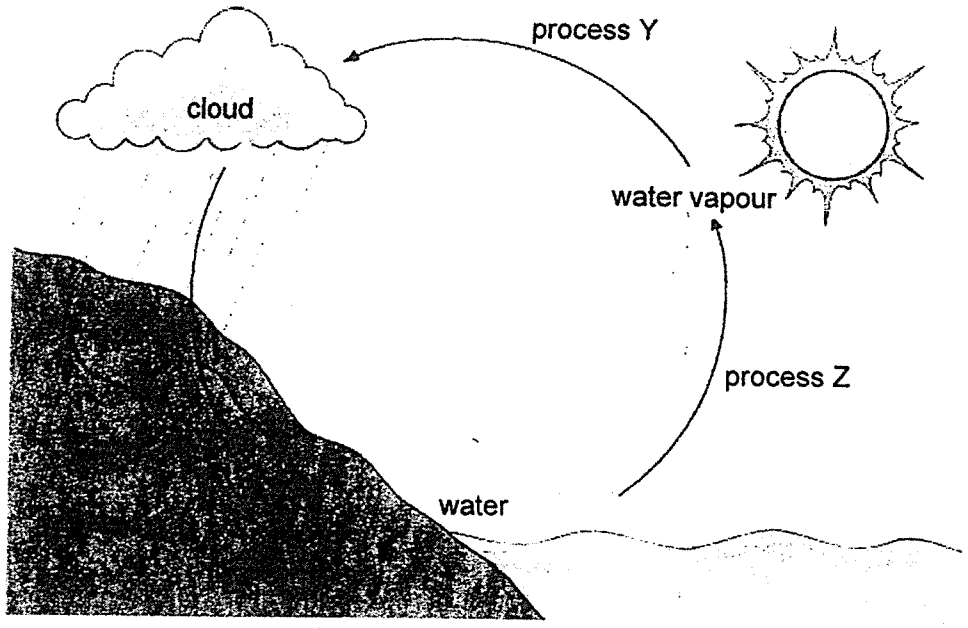
A The water in both set-ups started to boil at the same time.
B The water in both set-ups was at the same temperature when it was boiling.
C The water in set-up Y had more heat energy than the water in set-up X after 15 minutes.

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

22 The table shows the different weather conditions from Monday to Thursday. On which day would the wet clothes that are hung in the open take the shortest time to dry?

	Day	Sunny	Windy	Surrounding temperature (°C)
(1)	Monday	Yes	No	33
(2)	Tuesday	Yes	Yes	33
(3)	Wednesday	No	No	28
(4)	Thursday	No	Yes	28

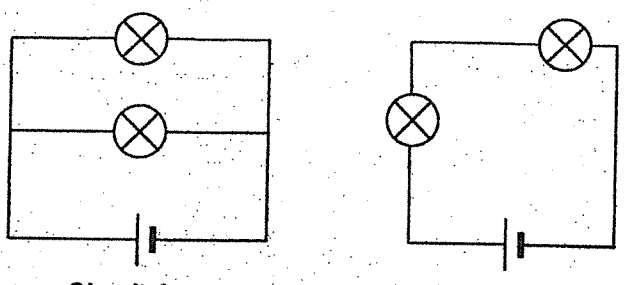
23 The diagram shows the water cycle.



Which of the following statements is correct?

(1) Process Z occurs above 30°C only.
(2) Process Y occurs during daytime only.
(3) Process Y involves a gas becoming a liquid.
(4) Heat energy is transferred only during process Z.

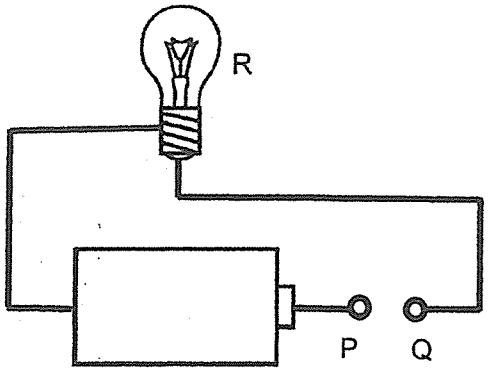
24 Study circuits A and B.



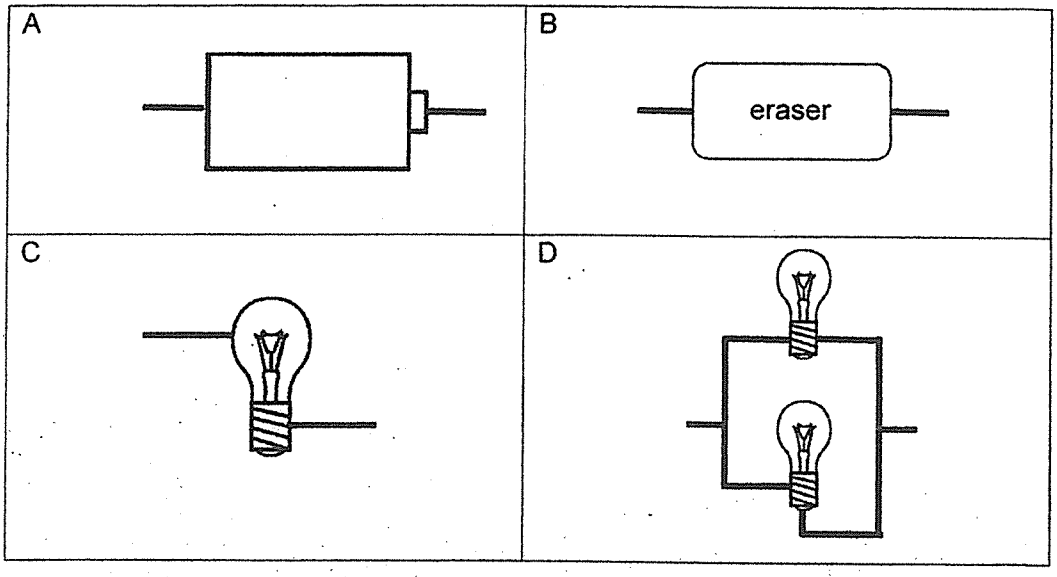
Which of the following statements is true?

(1) The battery and the wires are the sources of energy.
(2) The bulbs in circuit A light up as brightly as bulbs in circuit B.
(3) In both circuits, when one bulb fuses, the other bulb can still work.
(4) More electric current flows through each bulb in circuit A than in circuit B.

25 Study the circuit.

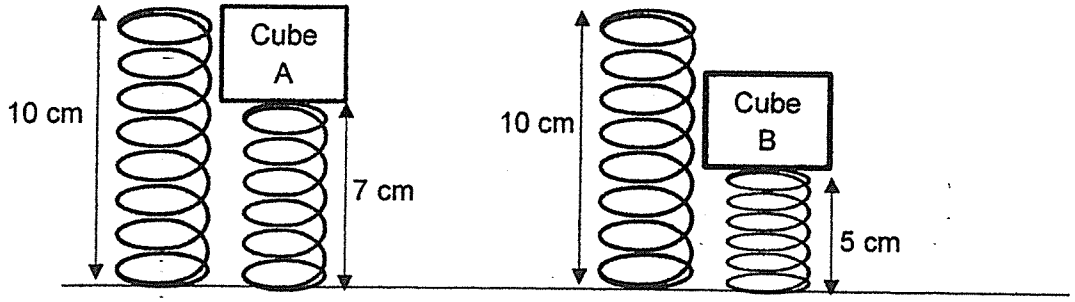


Which of the following, when placed between P and Q, would cause bulb R to light up?



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

26 Lynn had two cubes of the same size. She placed them on a spring, one at a time, as shown.



Based on her observation, what could she conclude from the experiment?

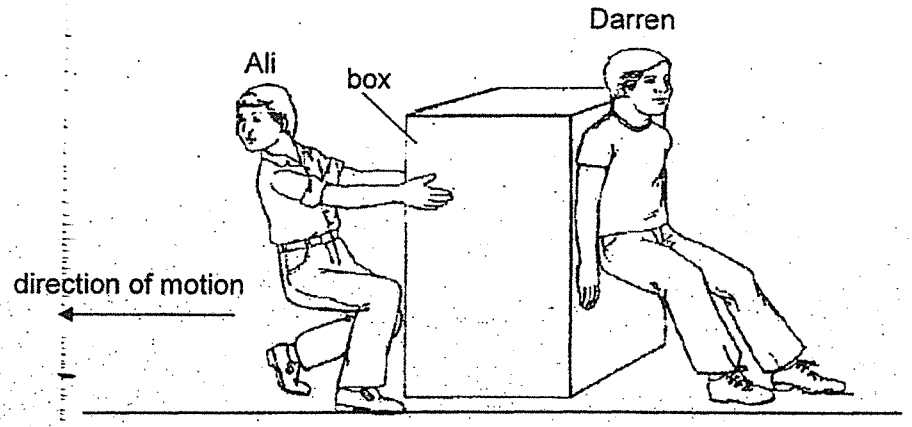
(1) Cube A has a larger mass than cube B.

(2) Elastic spring force is only acting on cube B.

(3) There is more gravitational force acting on cube B than cube A.

(4) There is more elastic spring force acting on cube B than cube A.

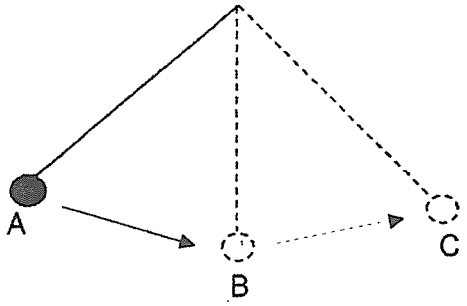
27 Ali and Darren moved a box in the same direction together.



Which of the following shows the types of forces exerted by the two boys on the box and on the floor?

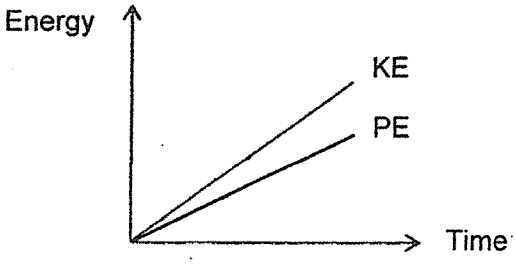
	Ali's hand on the box	Darren's legs on the floor
(1)	Push	Pull
(2)	Push	Push
(3)	Pull	Pull
(4)	Pull	Push

28 Wei Ming released a bob from position A which then moved to position B then C.

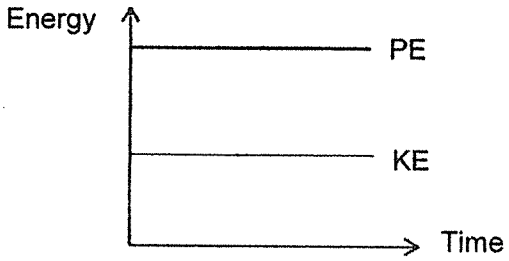


Which of the graphs shows the correct change in the kinetic energy (KE) and potential energy (PE) of the bob from B to C?

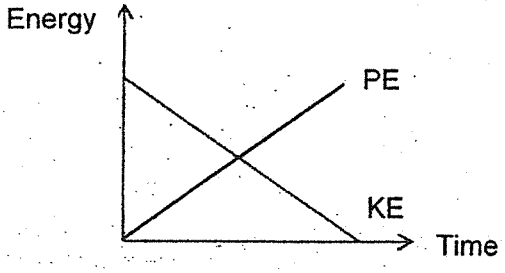
(1)



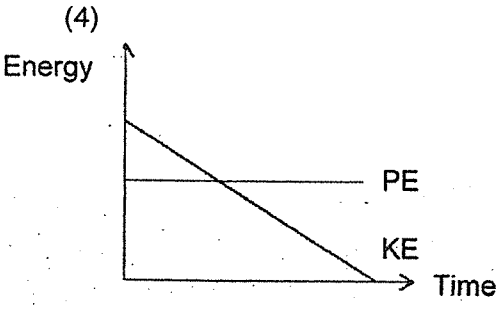
(2)



(3)



(4)



Anglo-Chinese School
(Primary)

A Methodist Institution
(Founded 1886)

PRELIMINARY EXAMINATION 2023
SCIENCE
PRIMARY SIX
BOOKLET B

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

Date: 23 August 2023 **Total Time for Booklets A and B: 1 h 45 min**

_____
Parent's/ Guardian's signature

INSTRUCTIONS TO CANDIDATES

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

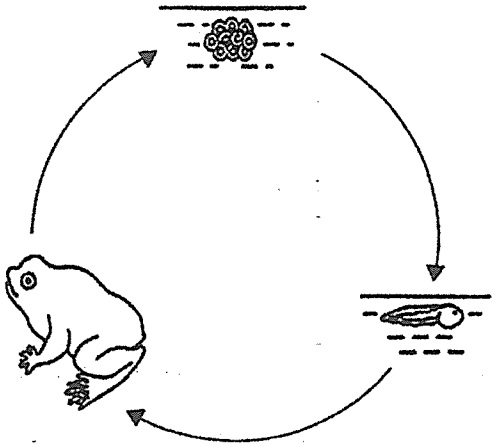
BOOKLET	MAX MARKS	MARKS OBTAINED
A	56	
B	44	
Total	**100**	

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

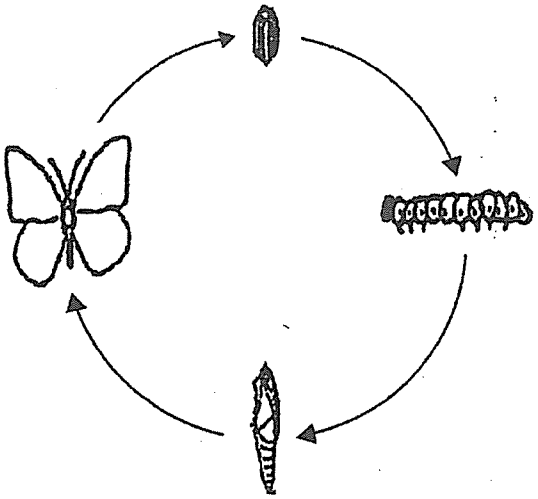
For questions 29 to 40, write your answers in this booklet.
The number of marks available is shown in brackets [ ] at the end of each question or part question.

(44 marks)

29 The diagrams show the life cycles of organisms P and Q.



Organism P



Organism Q

(a) Based on the diagrams, state one similarity and one difference based on what you can observe about the life cycles of organisms P and Q as shown above. [2]

(i) Similarity:

(ii) Difference:

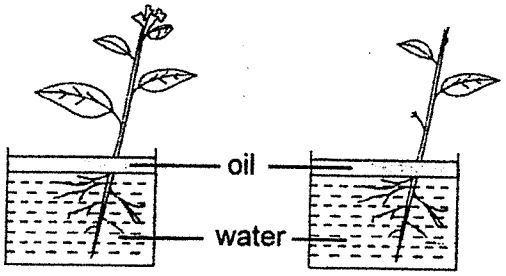
(b) Both organisms P and Q lay many eggs at a time. Explain the advantage of laying many eggs at a time. [1]

(c) How do the adult of organism P and its young breathe in water? [1]

(Go on to the next page)

Score /

30 Tom conducted an experiment to find out how the number of leaves affects water loss by the plants using the set-ups below. Both set-ups were put near a window.

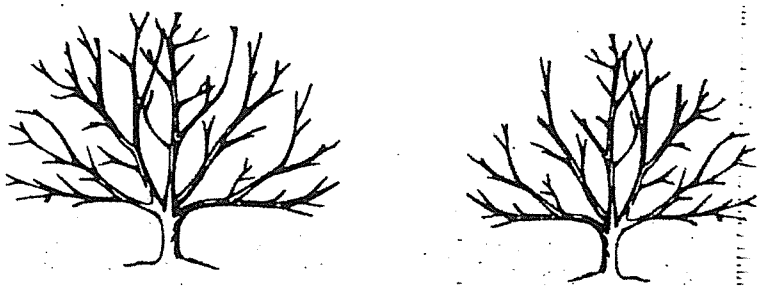


Set-up S Set-up T

After some time, Tom observed that the amount of water left in set-up S was less than set-up T.

(a) Explain the difference in the amount of water left. [1]

Tom observed that during the colder and darker months, the leaves fell off most trees. However, the trees continued to survive.



(b) Based on Tom's experiment in part **(a)**, explain how this adaptation helps the trees survive. [1]

(c) After the colder and darker months have ended, explain how the trees would continue to survive. [2]

(Go on to the next page)

Score 4

31 A scientist identified some female insects and their eggs on his plant. Diagram A shows an insect feeding on the stem of the plant. Diagram B shows the cross section of the stem.

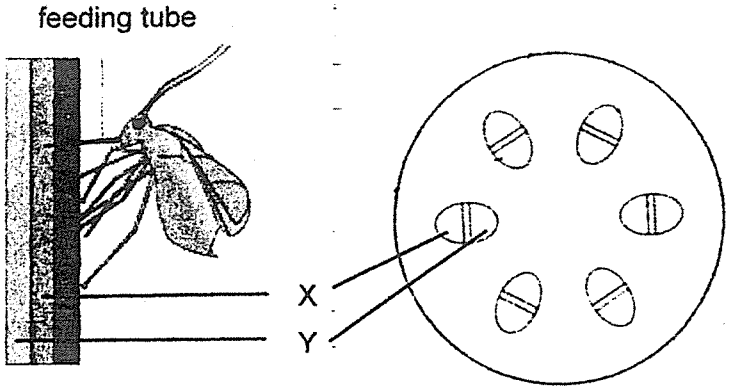


Diagram A Diagram B

(a) Identify parts X and Y. [1]

X: _____

Y: _____

(b) What is the function of part X? [1]

_____

_____

(c) The scientist sprayed substance M around the plant which produced a smell that repelled the adult insect. After a month, he observed that the population size of the insect on the plant decreased. Give two reasons for this observation. [1]

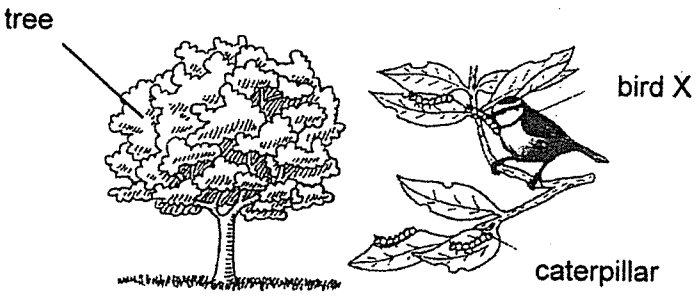
_____

_____

_____

Score /3

32 The diagram shows three organisms in a garden community. The caterpillar feeds on the leaves of the tree. Bird X feeds on the caterpillar.



(a) **(i)** The tree and bird X depend on each other. How does bird X benefit the tree? [1]

_____

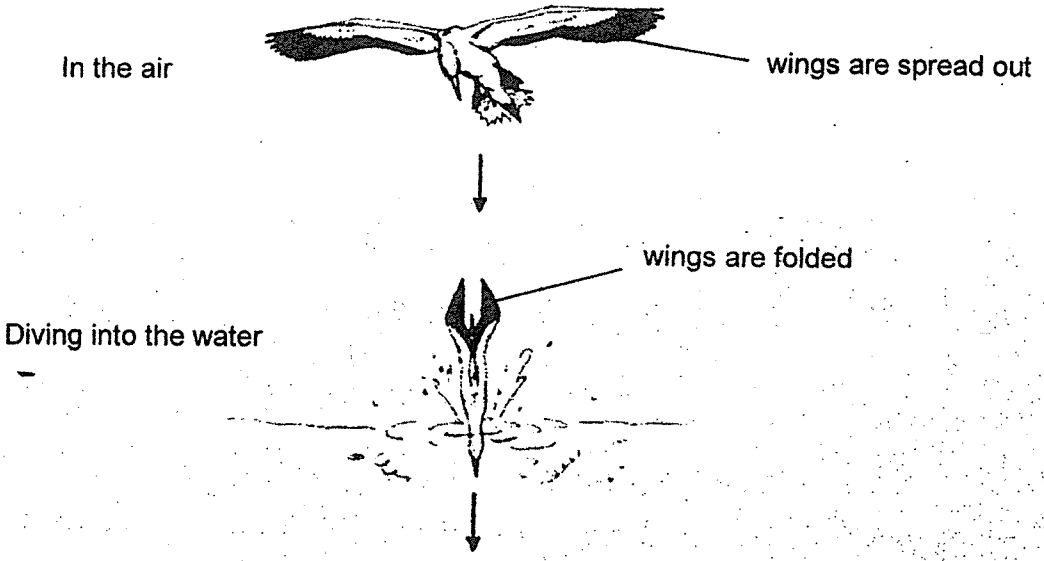
_____

(ii) Other than the availability of food, how does the tree benefit bird X? [1]

_____

_____

(b) The diagram shows how bird Y catches fish for food.



The wings of bird Y are spread out when it is flying in the air, and it will fold its wings when it dives into the water to catch its prey. State this adaptation and explain how it helps bird Y catch its prey in the water. [1]

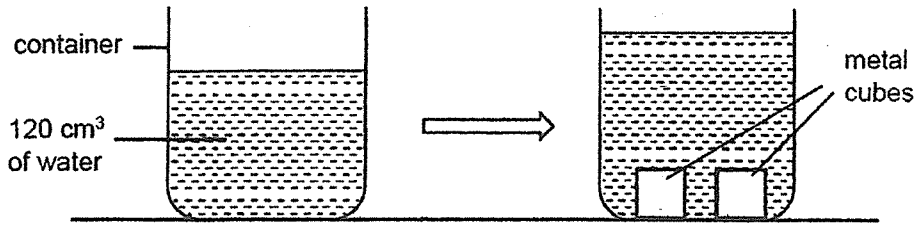
_____

_____

(Go on to the next page)

Score 3

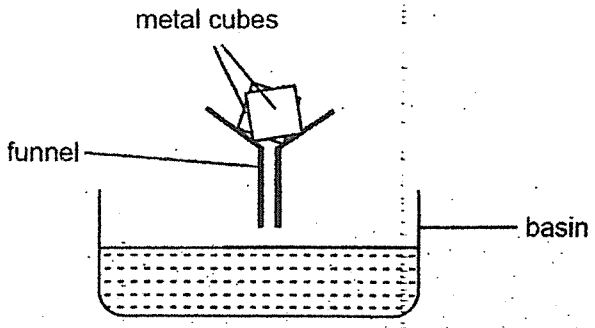
33 Jenny prepared a container which has a capacity of 200 cm^3 for an experiment. She filled it with 120 cm^3 of water as shown. Next, she added two metal cubes, each with a volume of 30 cm^3, into the container.



Jenny noticed that the water level increased. She wanted to add another identical cube without the water overflowing.

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

Jenny poured the contents of the container through a funnel into a basin as shown. She observed that the two metal cubes stayed on the funnel.



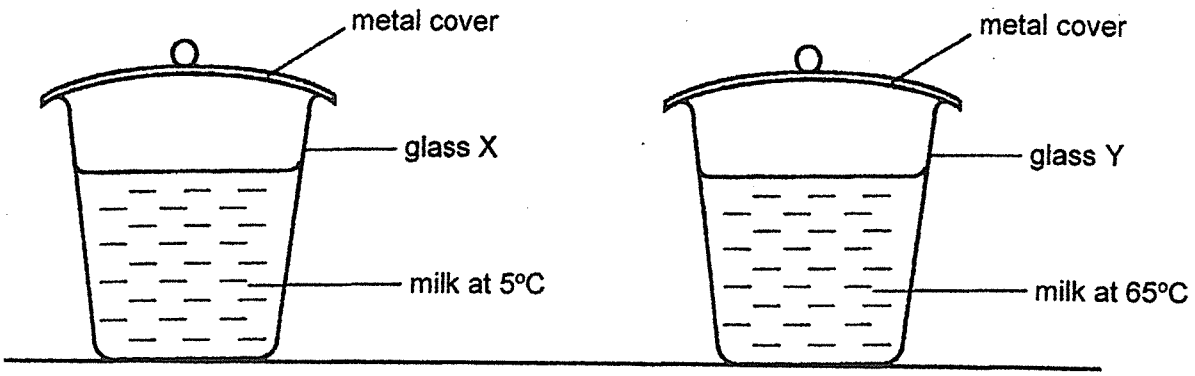
(b) Explain in terms of properties of matter, how the metal cubes were separated from the water. [1]

(c) The volume of the metal cubes increased when Jenny heated up the metal cubes. She concluded that the mass of the metal cubes also increased. Do you agree with her? Explain your answer. [1]

(Go on to the next page)

Score /3

34 Calvin conducted an experiment to find out where water droplets would form on two identical glasses of milk at different temperatures as shown. He placed the two glasses of milk on the table in a room at 30°C for 10 minutes.



Set-up A Set-up B

(a) Predict specifically where the water droplets would form in both set-ups after 10 minutes. [1]

(i) Set-up A:

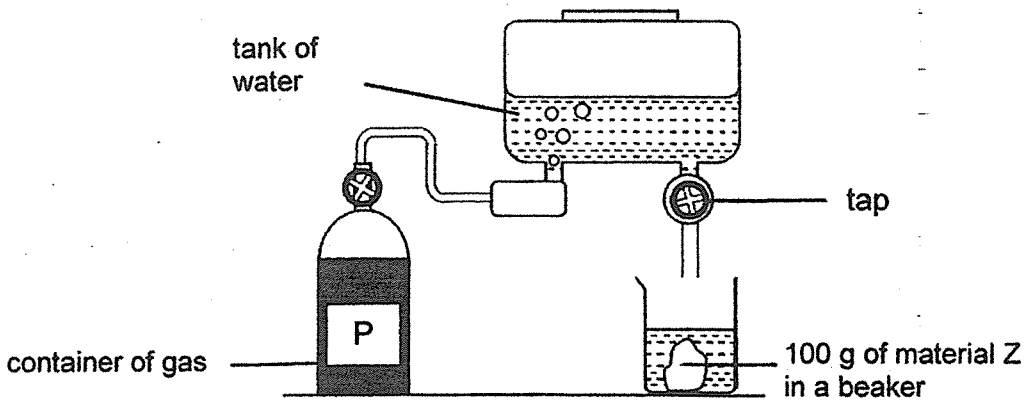
(b) Explain how the water droplets are formed in set-up B. [2]

(c) In set-up B, how will the amount of water droplets change if the metal cover is replaced with a plastic cover? Explain your answer. [2]

(Go on to the next page)

Score /5

35 Mary wanted to find out how gases P, Q, R and S affect material Z. She set up an experiment as shown.



She released gas P from its container completely into the tank of water. This mixture of gas P and water was then released into a beaker which contained 100g of material Z. After 20 minutes, she took out material Z from the beaker and recorded its mass. She repeated the experiment using gases Q, R and S and recorded her results in the table.

Gases	Mass of material Z (g)	
	Before the experiment	After the experiment
P	100	37
Q	100	28
R	100	100
S	100	54

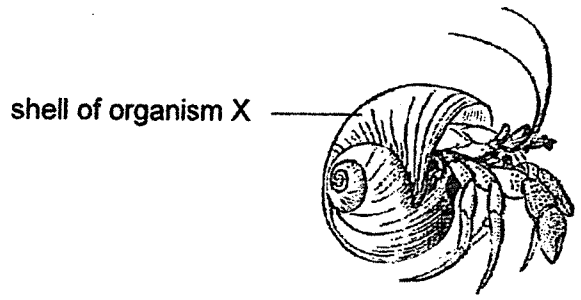
(a) Put a tick (✓) for the variable(s) that Mary must keep the same to ensure a fair test. [1]

Variables	To keep constant (✓)
The type of gas used	
Mass of material Z after 20 minutes	
Amount of mixture released into the beaker	
Amount of gas released into the tank of water	

(b) Based on her results, what can she conclude about all the four gases P, Q, R and S? [1]

Question continues on the next page.

(c) The shell of organism X is made of material Z.

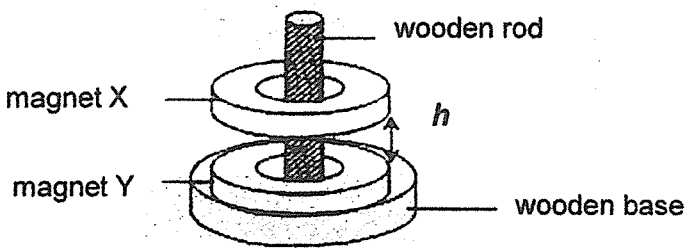


A mix of gases P, Q, R and S are found in acid rain. Explain how acid rain is harmful to organism X. [2]

(Go on to the next page)

Score	/4

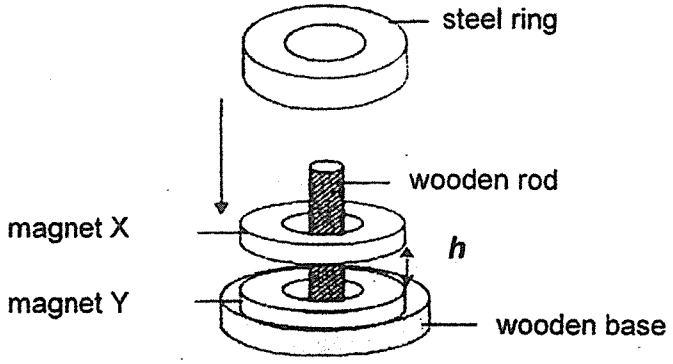
36 Halim placed two identical ring magnets, X and Y, through a wooden rod as shown.



He observed that the two magnets were at a distance, ***h***, from each other.

(a) State the forces acting on magnet X in the set-up above. [1]

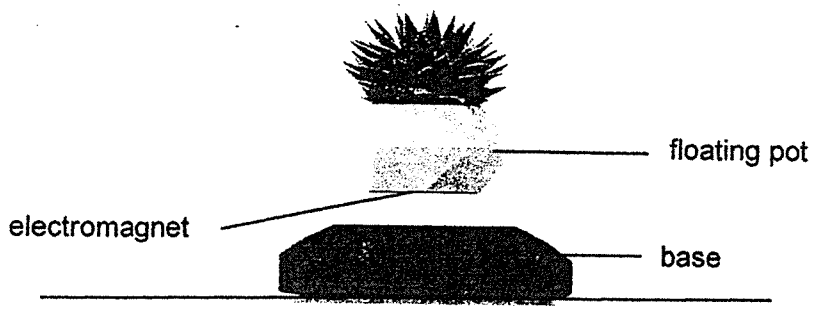
He then put a steel ring on top of magnet X.



(b) What happened to distance ***h*** when the steel ring was placed on top of magnet X? Explain your answer. [1]

Question continues on the next page.

The diagram shows a floating pot of plant.



The floating pot consists of a base on the floor and an electromagnet at the bottom of the floating pot.

(c) Describe how the floating pot works. [2]

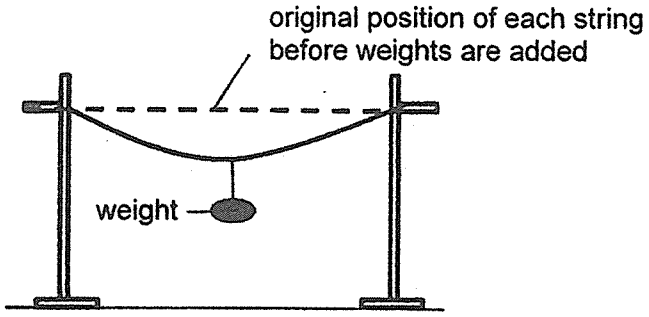
It was observed that the floating pot would stop floating and drop on the base if its mass was greater than 2 kg.

(d) Suggest a way to allow the pot to continue floating. [1]

(Go on to the next page)

Score / 5

37 Wayne set up an experiment as shown to investigate a property of four strings, made of different materials J, K, L and M. For each string, he added weights on the string until it broke.



His results are as shown in the table.

Material	Mass of the weights just before the string broke (g)
J	40
K	100
L	130
M	60

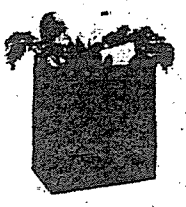
(a) Which property of the material is Wayne testing for? [1]

_____

(b) State one variable of the string that Wayne must keep the same to ensure a fair test. [1]

_____

A grocery bag is used to contain heavy groceries purchased from a supermarket.



(c) Based on the results of Wayne's experiment, which material, J, K, L and M, is the most suitable to make the grocery bag? Explain your answer. [1]

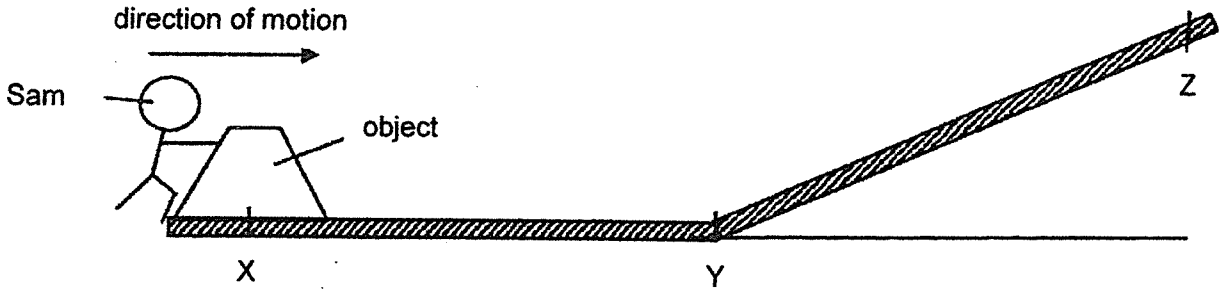
_____

_____

(Go on to the next page)

Score | /2

38 Sam pushed an object over the same type of surface from points X to Z as shown in the diagram.



(a) Sam needed more force to push the object from Y to Z compared to from X to Y. Explain why. [1]

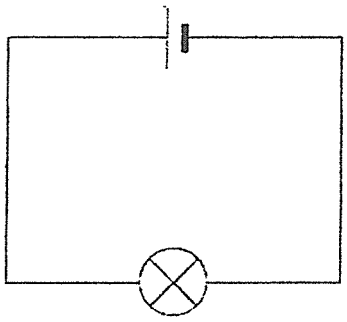
(b) Without having another person to help Sam, suggest a method to allow him to reduce the amount of force needed to push the object from Y to Z. [1]

(c) Explain, in terms of forces, how your method stated in **(b)** will reduce the amount of force needed to push the object from Y to Z. [1]

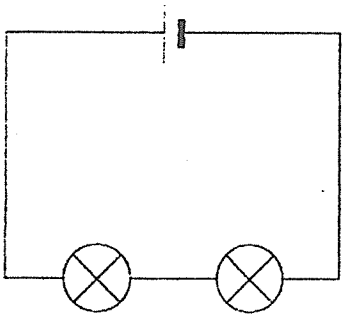
(Go on to the next page)

Score 3

39 Study the diagram of circuits A and B.



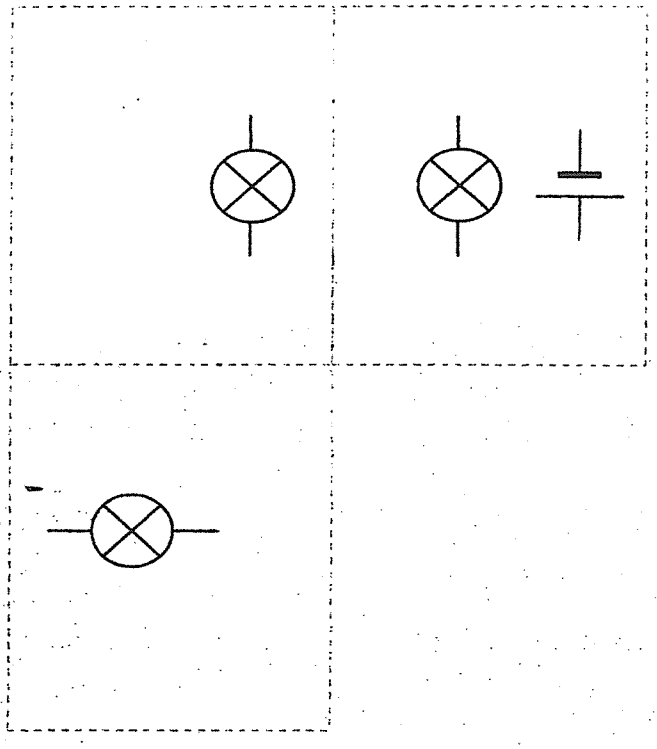
Circuit A



Circuit B

(a) Add another bulb to circuit A such that both bulbs in that circuit are brighter than the bulbs in circuit B. Draw the bulb and wires in circuit A. [1]

The diagram below shows a house with three rooms.

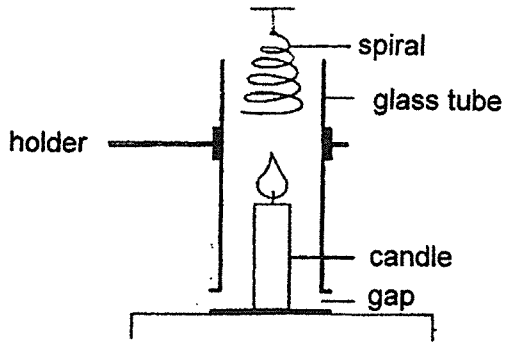


(b) Complete the circuit diagram such that the bulb in each room is controlled by a switch in each room. Turning the switch on/off in any room should not affect the bulbs in the other rooms.
(Do not add extra batteries. You may use up to 3 switches.) [2]

(Go on to the next page)

Score / 3

40 Study the diagram.



(a) Explain in terms of energy conversion how heat energy caused the spiral to spin. [2]

(b) If there was no gap in the set-up, the spiral would spin very slowly. Explain how the presence of the gap allowed the spiral to spin faster. [2]

End of Paper

Check your work.

Score	/ 4

YEAR : 2023
LEVEL : PRIMARY 6
SCHOOL : ANGLO-CHINESE SCHOOL (PRIMARY)
SUBJECT : SCIENCE
TERM : PRELIMINARY EXAMINATION

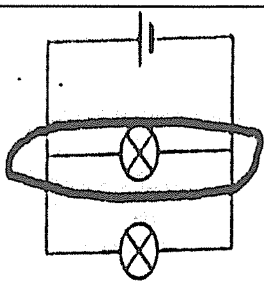
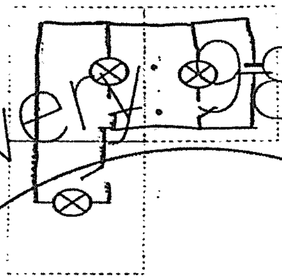
(BOOKLET A)

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

(BOOKLET B)

Q29	a)	(i) Similarity: The young of both organism P and Q does not look like the adult. OR Both have an egg stage. (ii) Difference: Organism P has a 3-stage life cycle, but organism Q has a 4-stage life cycle.
	b)	To ensure that while some eggs might be eaten by predators, most can continue to survive by hatching into young.
	c)	The adult of P breathes through its moist skin and the young breathe through their gills.
Q30	a)	Water was lost / evaporated through the leaves. Since set-up S has more leaves, more water evaporated through the leaves.
	b)	To prevent water loss.
	c)	Leaves will grow / develop and they can (continue to) make food (photosynthesis).
Q31	a)	X: food-carrying tube (phloem) Y: water-carrying tube (Xylem)
	b)	To transport food/sugar to the leaves to the rest of the plant.
	c)	The adult insects move away from the plant. The eggs hatch into larva/adult and move away from the plant.
Q32	a)	(i) More leaves can survive as there will be less caterpillars to feed on the leaves of the tree. (ii) The tree provides the bird with shelter/ a place to build its nest.
	b)	It has a streamline body shape to move faster in the water. OR It has a streamlined body shape to reduce water resistance.
Q33	a)	The cubes have a definite volume. The extra cube will occupy more space in water and will cause it to overflow.
	b)	The cubes (solid) have a definite shape while water (liquid) does not have a definite shape and can pass through the funnel.
	c)	The mass of an object does not change when the object is heated.

Q34	a)	(i) Set-up A: At the outer surface of the glass X (and some at the inner surface). (ii) Set-up B: At the surface of the metal cover.
	b)	The water in the hot milk evaporates into water vapour loses heat to the colder metal cover and condenses into water droplets on the underside of the metal cover.
	c)	Less water droplets is formed. The plastic cover will be a poorer conductor of heat, so the water vapour loses heat to the plastic cover slower, condensing / forming less water droplets.
Q35	a)	**Variables** / **To keep constant(✓)** The type of gas used Mass of material Z after 20 minutes Amount of mixture released into the beaker ✓ Amount of gas released into the tank of water ✓
	b)	Gases P, Q and S cause the mass of material Z to be lesser. But R does not material Z.
	c)	Acid rain will damage the shell of organism X such that; it has less/no protection from its predators OR it cannot hide from its predators. OR It has less/no protection from the harsh weather conditions. OR Its flesh is damaged by the acid rain.
Q36	a)	Gravitational force/gravity and magnetic force.
	b)	It decreased. The steel ring has weight that acts against the magnetic force (and it will reduce the distance h).
	c)	The base is a magnet and the like-poles of the base and the electromagnet are facing each other and will repel.
	d)	Use a stronger magnet as the base. OR Increase the strength of the electromagnet by increasing the number of batteries / putting more coils of wires around the electromagnet.
Q37	a)	Strength of a material / how strong the material is.
	b)	length / thickness of the string.
	c)	Material L, it can hold the most amount of weight before the string broke. OR It can hold heavy grocery without breaking. Therefore, it is the strongest material.
Q38	a)	He is pushing the object against gravity / in the opposite direction of gravity.
	b)	Add a lubricant on the bottom of the object. OR Add a lubricant on the surface of Y to Z. OR Add ball bearings/wheels under the object.
	c)	The (method above) reduces the amount of friction / frictional force between the object and the surface to Y to Z / YZ.

Q39	a)	
	b)	
Q40	a)	Heat energy of the flame is transferred to heat energy of the air. This heat energy is converted to kinetic energy of the moving rising hot air. This kinetic energy is converted to kinetic energy of the spinning spiral.
	b)	The gap allowed more air to enter and be heated so that more heat energy of the air can be converted to more kinetic energy of the moving air.

END