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

PRELIMINARY EXAMINATION 2024
SCIENCE
PRIMARY SIX
BOOKLET A

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

Date: 20 August 2024 **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 21 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 and 4) and shade your answer on the Optical Answer Sheet. (56 marks)

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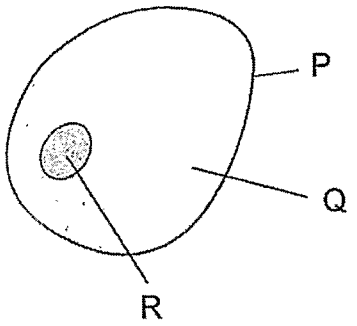
1 The diagram shows an animal cell.

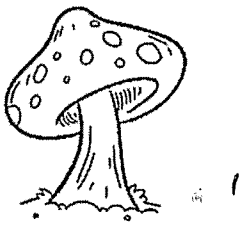


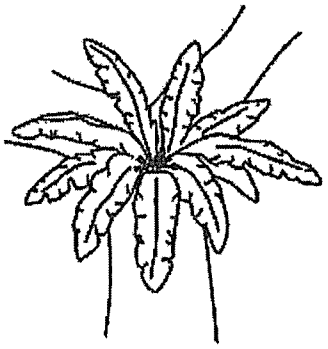
Which of the labelled structures are also found in a root cell?

	P	Q	R
(1)			√
(2)			X
(3)	√	X	√
(4)	X	X	√

Key	
√	present
X	absent

2 Which statement is correct about the mushroom and the fern?





(1) Both are plants.

(2) Both grow only on trees.

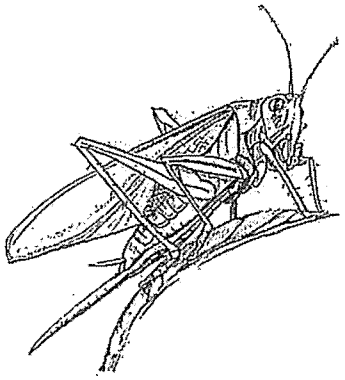
(3) Both reproduce from spores.

(4) Both cannot make their own food.

3 The table below shows how some animals can be grouped.

Characteristics	D	E	F	G
Does it moult?	No	Yes	No	Yes
Does it have a 4-stage life cycle?	No	No	Yes	No
Does its young resemble the adult?	Yes	Yes	Yes	No
Does it have wings?	No	Yes	Yes	No

The diagram shows a grasshopper.



Based on the information given in the table above, which group does the grasshopper belong to?

(1) D

(2) E

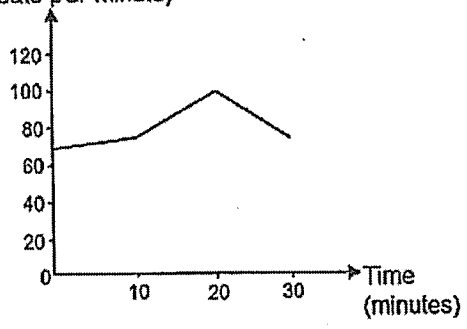
(3) F

(4) G

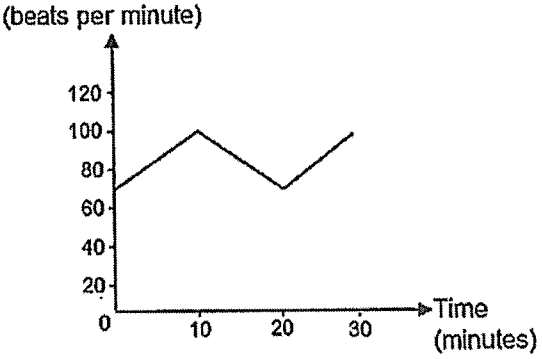
4 Danny starts his exercise with a 10-minute walk. Then, he jogs for another 10 minutes before slowing down to a stop.

Which of the following graphs correctly represents Danny's heart rate during his exercise?

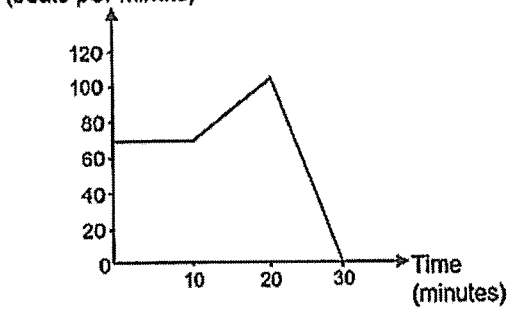
(1)



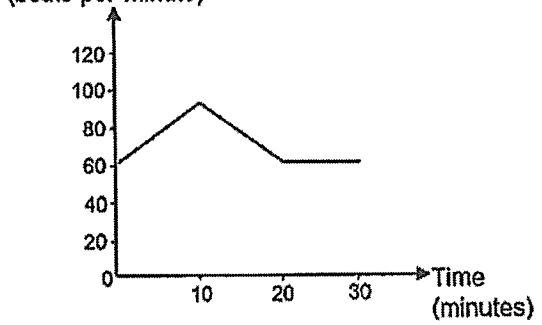
(2)



(3)



(4)



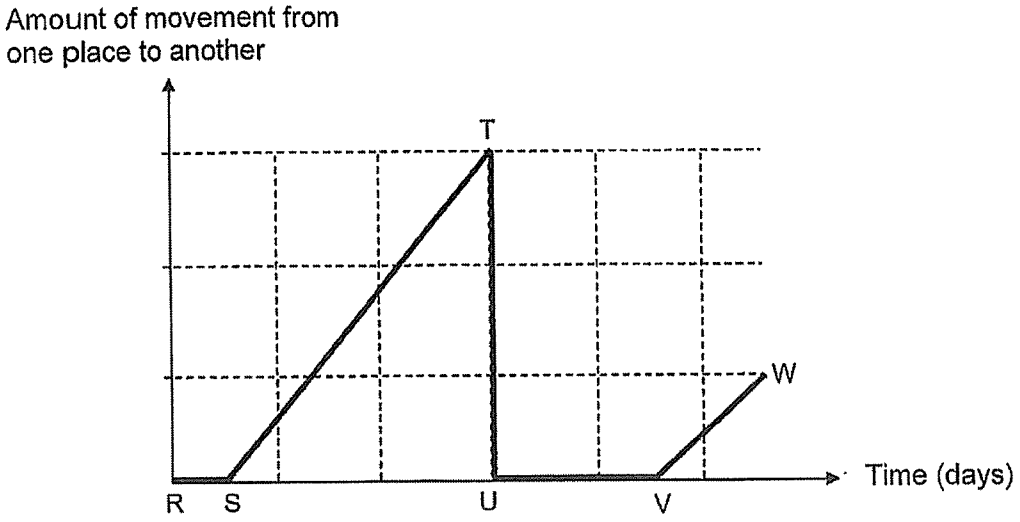
5 The table shows the characteristics of two organisms, A and B, living in the same environment.

Organism	Characteristics
A	• Needle-like leaves • Swollen stems • Presence of chloroplasts in the stem
B	• Large ears • Hides in burrows in the day • Hunts only at night

Which one of the following best describes the characteristics of the environment which you would most likely find both organisms A and B in?

	Characteristics of the environment	
	Temperature of the surroundings	**Amount of water**
(1)	Low all the time	Very little water
(2)	Higher in the day than at night	Plenty of water
(3)	Low all the time	Plenty of water
(4)	Higher in the day than at night	Very little water

6 The graph shows the movement of a butterfly as it goes through the different stages of its life cycle.



Which section of the graph best represents the butterfly in its pupa stage?

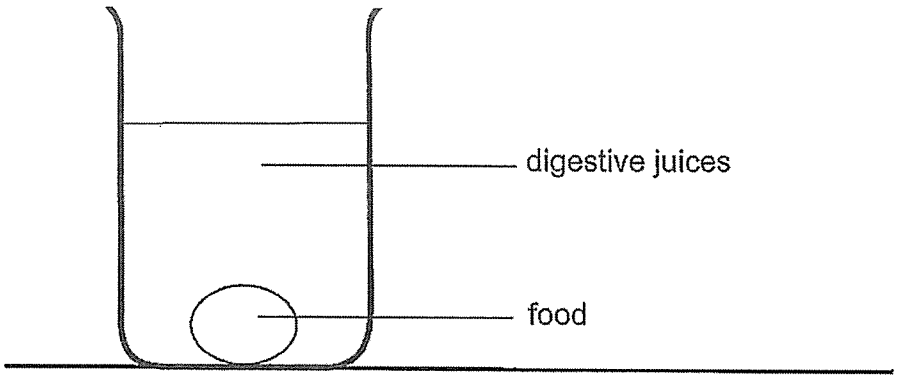
(1) RS

(2) ST

(3) UV

(4) VW

7 Salena wanted to find out how the volume of digestive juices affects the time taken for food to be digested using the set-up shown.



She repeated the experiment with different volumes of digestive juices and different amounts of food as shown in the table.

Experiment	Volume of digestive juices (ml)	Amount of food (g)
A	250	100
B	200	100
C	250	50
D	200	50

Which two experiments should she use to conduct a fair test?

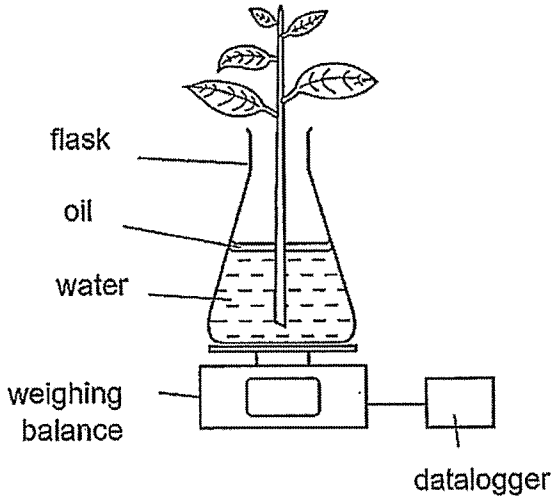
(1) A and B

(2) A and C

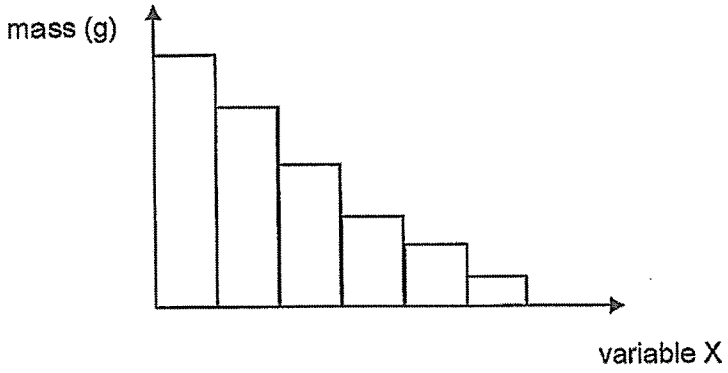
(3) B and C

(4) B and D

8 Samuel conducted an experiment using the set-up shown. The set up was placed next to the window. A datalogger recorded the mass every 30 minutes for 3 hours.



Samuel presented his findings in the graph shown.



What is variable X?

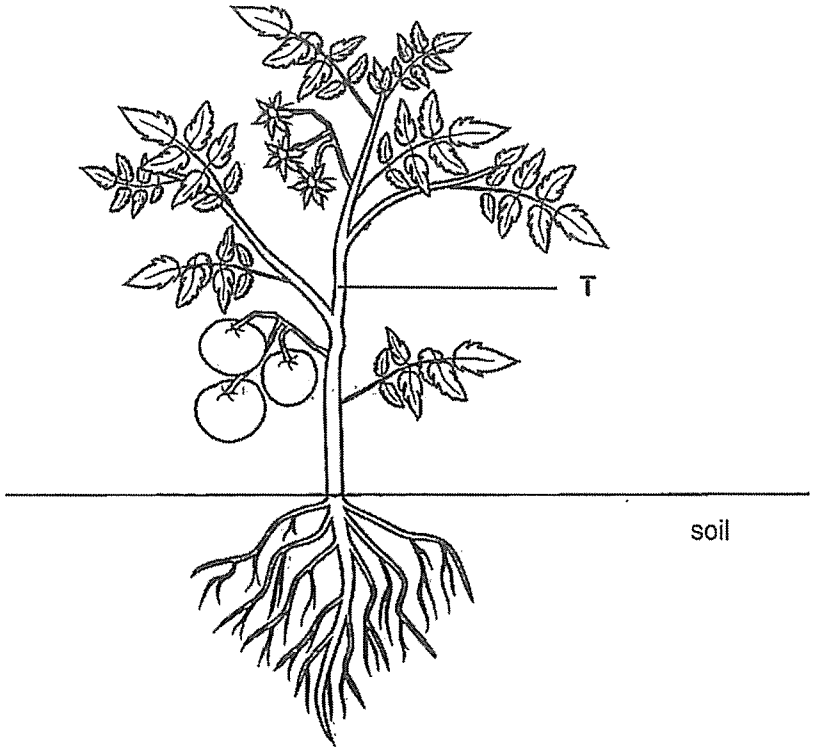
(1) time of the day

(2) number of leaves

(3) mass of the plant

(4) volume of water in the flask

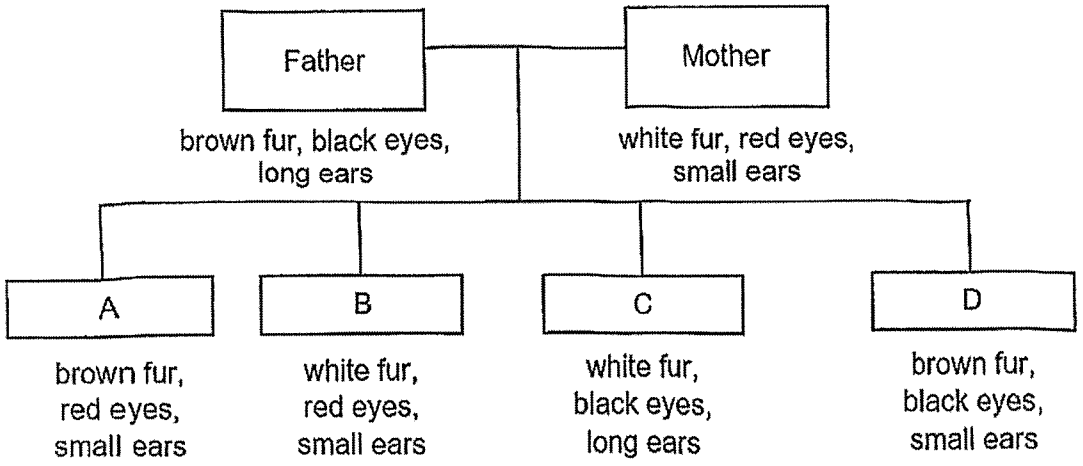
9 The diagram shows a plant.



Based on the diagram, which of the following shows the correct direction of movement of food and water at part T?

	Direction of movement at part T	
	Food	**Water**
(1)	downwards only	upwards only
(2)	upwards only	downwards only
(3)	upwards and downwards	upwards only
(4)	upwards and downwards	downwards only

10 The diagram below shows some characteristics of a family of rabbits.



Based on the information given, which young inherited all of its characteristics from only one parent?

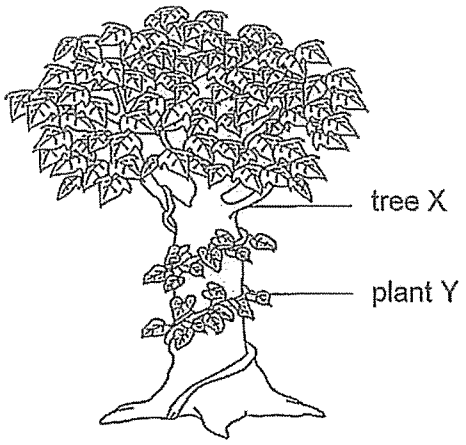
(1) A

(2) B

(3) C

(4) D

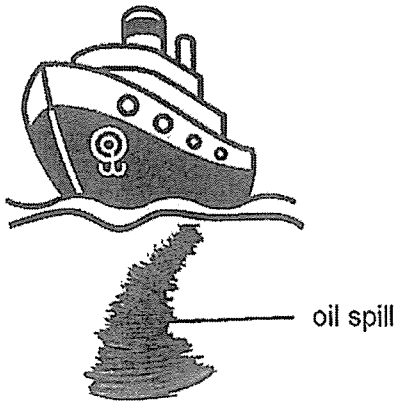
11 The diagram shows plant Y and tree X.



Plant Y winds itself upwards on tree X to receive more _____.

(1) water directly when it rains
(2) more fertiliser
(3) sunlight
(4) oxygen

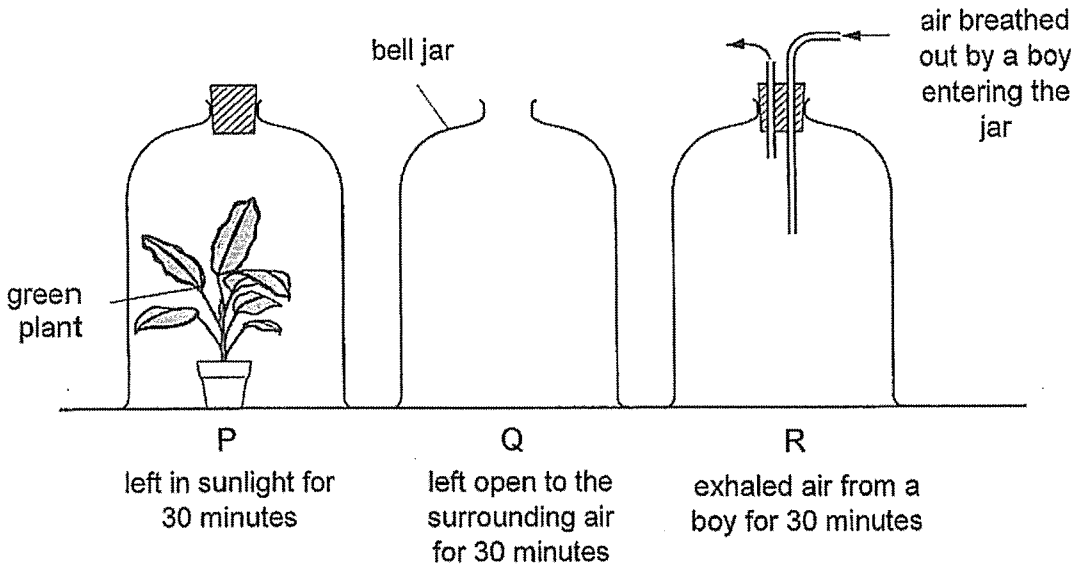
12 The diagram shows a type of pollution.



Which of the following is not an impact of the type of pollution shown?

(1) loss of habitat
(2) contamination of water
(3) less dissolved oxygen in the water
(4) emission of more greenhouse gases

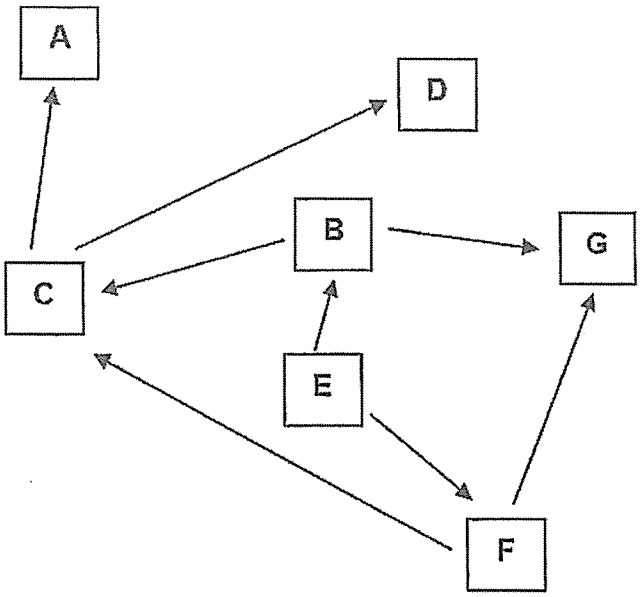
13 Three glass bell jars were set up as shown.



After 30 minutes, which row gives the correct amount of oxygen in each jar?

	most oxygen	**least oxygen**
(1)	P	Q
(2)	P	R
(3)	Q	P
(4)	R	P

14 The diagram shows part of a food web.



What is most likely to increase the size of population C?

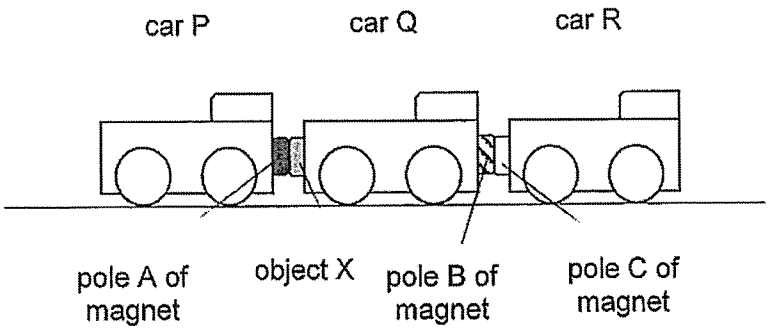
(1) fewer B

(2) fewer G

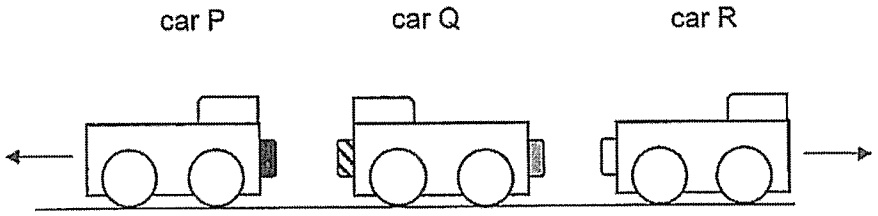
(3) more A

(4) more D

15 Ron has three toy cars, P, Q and R, as shown. When he pulled car P to the left, all three cars moved to the left.



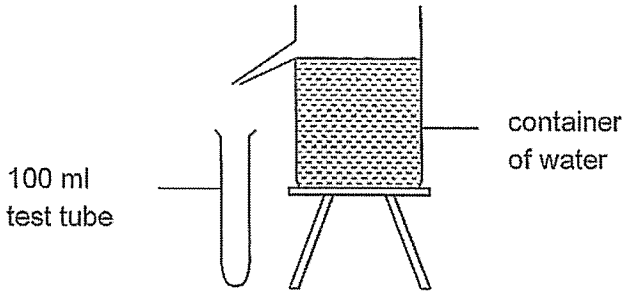
When he turned car Q around, car P moved to the left, car Q remained and car R moved to the right as shown.



Which conclusion about object X and the poles of A, B and C of the magnets is correct?

	X	A	B	C
(1)	magnet	S	S	S
(2)	magnet	N	N	S
(3)	magnetic material	S	N	S
(4)	magnetic material	S	S	N

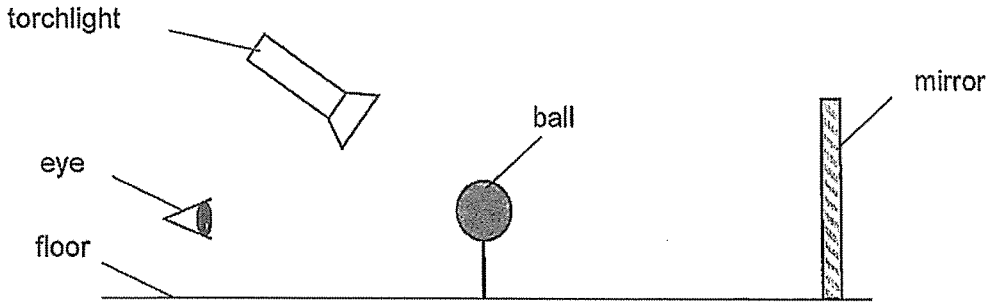
16 Sam wants to pour another 200 ml of water into the container of water as shown.



Which row shows the correct observation and reason after he poured the water?

	Observation	Reason
(1)	Some water will overflow from the test tube.	Water occupies space.
(2)	The water will fill up half of the test tube.	Water has a definite volume.
(3)	The beaker of water will become heavier.	Water has mass.
(4)	The water will change shape.	Water has definite shape.

17 In a dark room, Ted shone light onto a ball as shown and made some observations.



Which of the statements is correct?

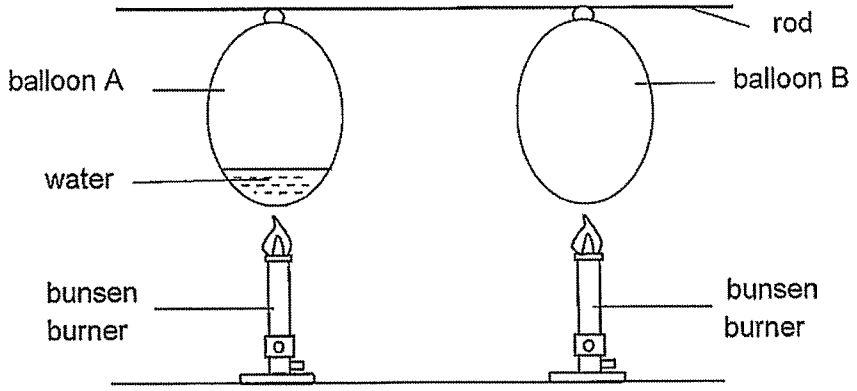
(1) The ball cast a shadow on the floor.

(2) The ball cast a shadow on the mirror.

(3) The mirror showed the image of the ball only.

(4) The torchlight and eye were the sources of light.

18 Vincent conducted an experiment using two similar balloons as shown. Balloon A had some water in it.



After a while, Vincent observed that balloon B burst but balloon A did not. Which of the best explains his observation?

(1) The air expanded faster in balloon A than B.

(2) Balloon A has water which absorbed all the heat.

(3) The air in balloon A gained heat faster than balloon B.

(4) The air in Balloon A gained heat slower than the air in balloon B.

19 The table shows the freezing and boiling points of four different substances.

Substance	Freezing point (°C)	Boiling point (°C)
A	0	100
B	17	118.1
C	5.5	80.2
D	43	181

Based on the information, which of the following statements is correct?

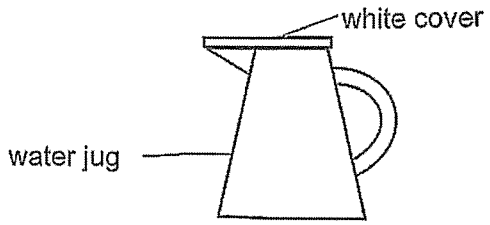
(1) Substance D is a solid at 30 °C.

(2) Substance A is a solid at 50 °C.

(3) Substance B is a gas at 100 °C.

(4) Substance A and C are liquids at 0 °C.

20 Wendy wanted to buy a water jug for her kitchen as shown. She wants a jug that allows her to check the water level easily.

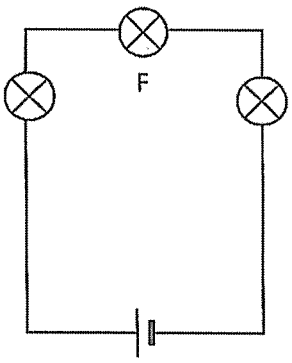


Based on the properties shown, which material should the jug be made of?

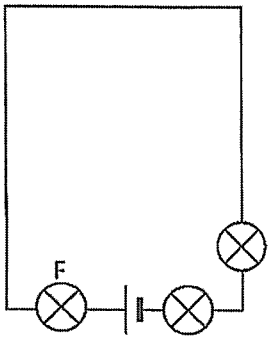
	Material	waterproof	strong	allows light to pass through
(1)	J		×	✓
(2)	K			×
(3)	L			
(4)	M			×

21 In which circuit will bulb F be the brightest?

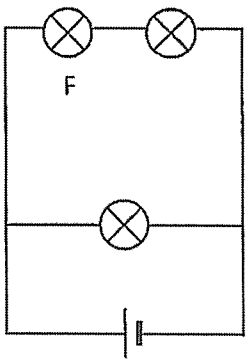
(1)



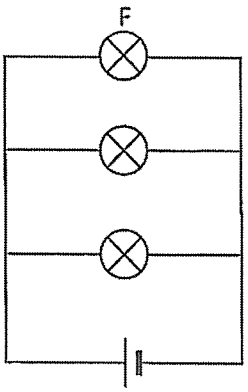
(2)



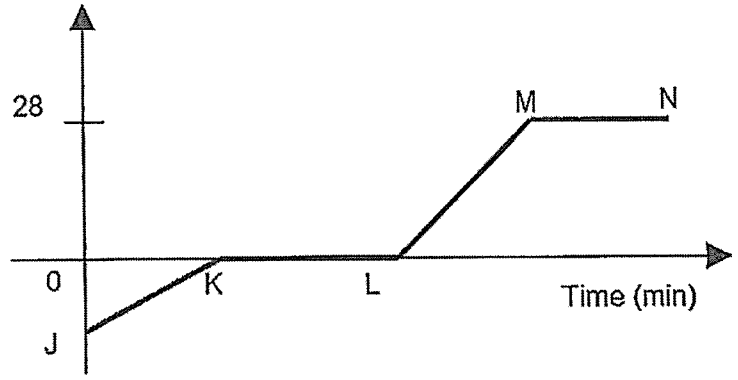
(3)



(4)



22 The graph below shows the temperature of a beaker of ice cubes over time.



Which of the following statements are correct?

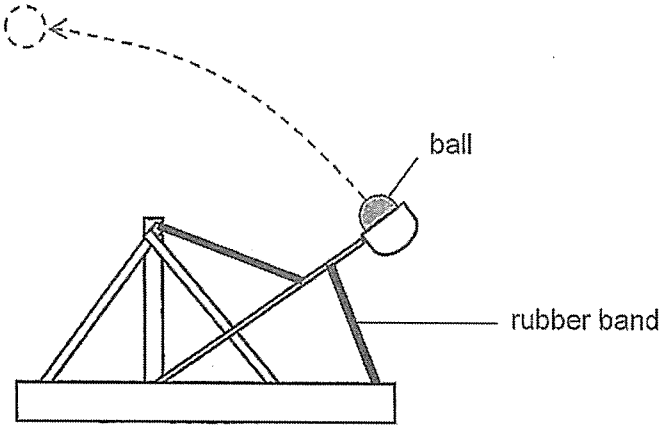
A There is no heat gained at MN.
B The ice cubes are melting at KL.
C Evaporation takes place at LM only.
D Water is in the solid state at JK only.

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

23 Which of the following is **not** a renewable source of energy?

(1) sun
(2) wind
(3) water
(4) candle

24 The diagram shows a path the ball took as it was being catapulted.



Which of the following energy conversions is correct?

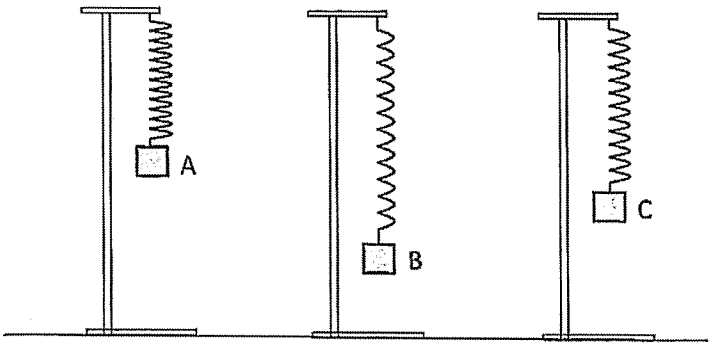
(1) kinetic energy ⟶ potential energy

(2) kinetic energy ⟶ heat + sound energy

(3) potential energy ⟶ kinetic energy ⟶ potential energy

(4) potential energy ⟶ sound energy + heat energy ⟶ kinetic energy

25 Zara hung three objects, A, B and C, on identical springs as shown.



Which of the following conclusions is correct?

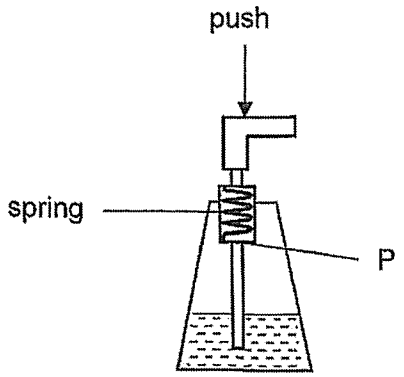
(1) Object A is heavier than object C.

(2) Object A exerts the least force on the spring.

(3) Object B exerts gravitational force on the spring.

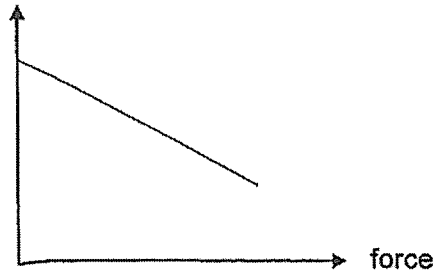
(4) Object A, B and C have elastic spring force.

26 The diagram shows a soap bottle with a pump. The spring cannot move below part P.

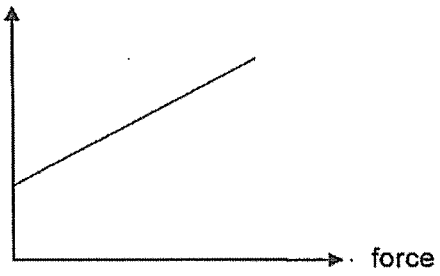


Which of the graphs correctly shows the relationship between the push force and length of the spring?

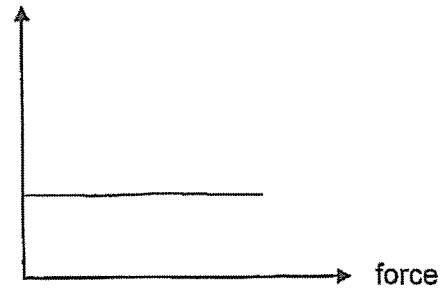
(1)



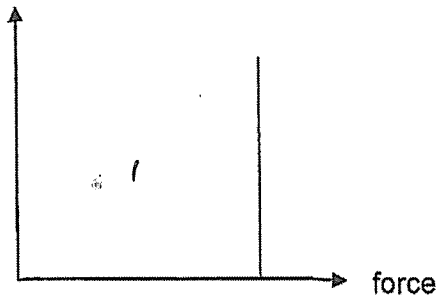
(2)



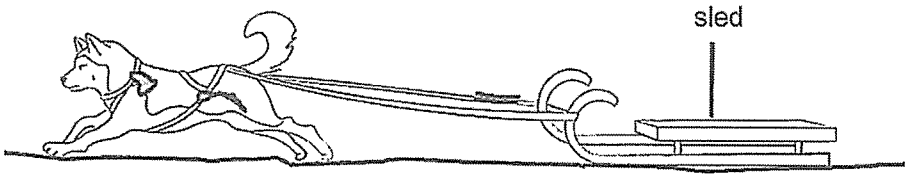
(3)



(4)



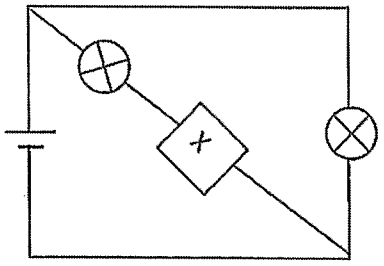
27 The diagram shows a dog pulling a sled across the ground.



Which of the following statements is correct?

(1) The dog exerts a force on the ground and the sled.
(2) There is no friction between the sled and the ground.
(3) The dog and the sled are moving in the opposite direction.
(4) The force acting on the sled is greater than the weight of the sled.

28 When object X was connected to the circuit, one bulb lit up.



What could object X be?

A steel paper clip
B copper wire
C magnet
D eraser

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

(Go on to Booklet B)

Anglo-Chinese School
(Primary)
A Methodist Institution
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PRELIMINARY EXAMINATION 2024
SCIENCE
PRIMARY SIX
BOOKLET B

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

Date: 20 August 2024 **Total Time for Booklets A and B: 1 h 45 min**

_____
Parent's/ Guardian's signature

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2. Do not turn over this page until you are told to do so.
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5. Write your answers in this booklet.

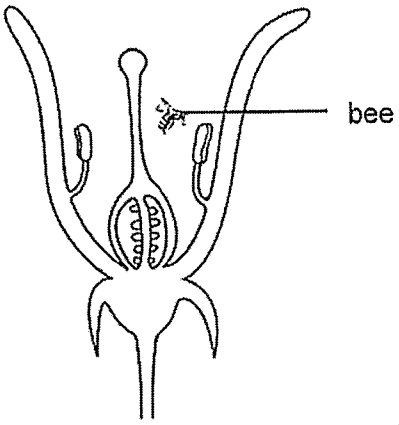
BOOKLET	MAX MARKS	MARKS OBTAINED
A	56	
B	44	
Total	**100**	

This booklet consists of 18 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 **(a)** State what pollination means. [1]

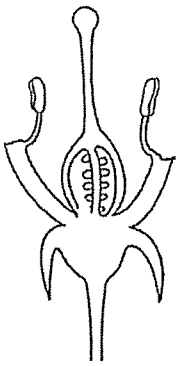
The diagram shows a cross-section of a flower.



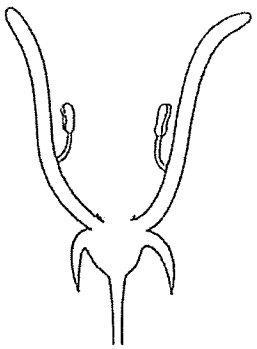
(b) It was observed that a bee was found inside the flower.
Describe the role of the bee in the pollination of this flower. [2]

(Go on to the next page)

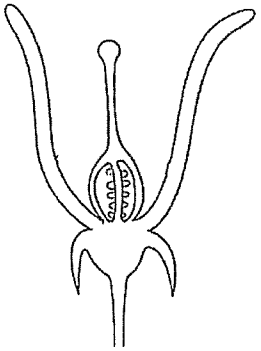
(c) Fred wanted to find out if a fruit can still be produced with certain parts of the flower removed. He labelled the three flowers, E, F and G, from the same plant and removed a certain part from each of the flowers.



Flower E



Flower F



Flower G

Explain why Fred noticed that flowers E and G had developed into fruits but not flower F after a few weeks. [1]

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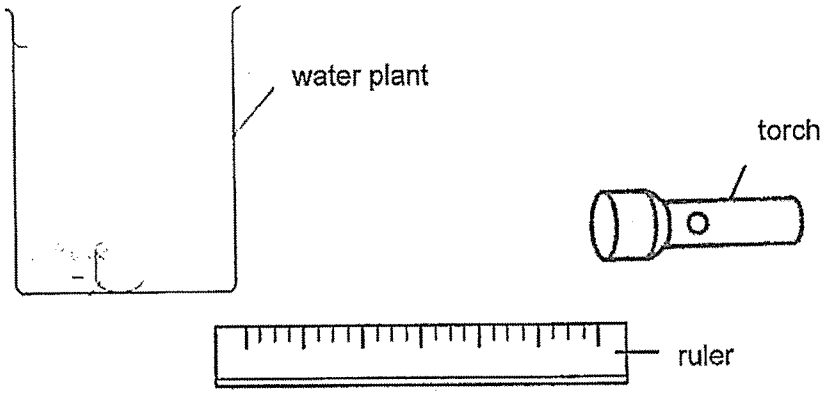
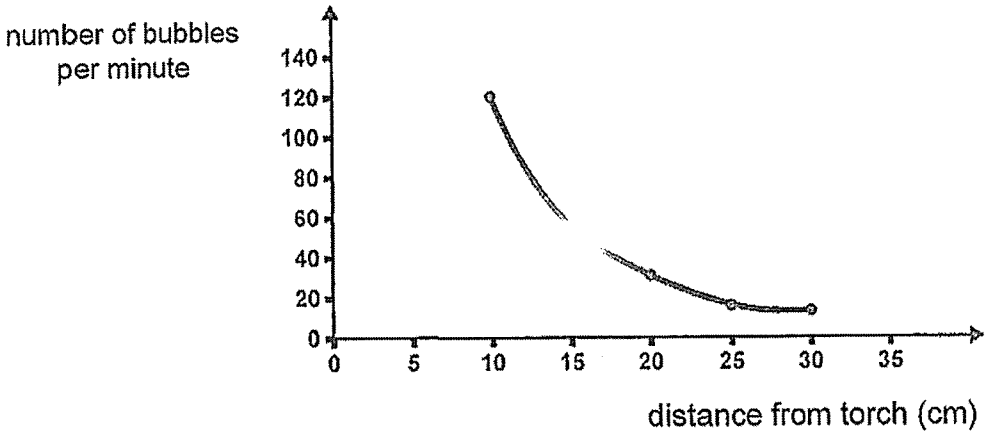
Score	/4

30 Ted carried out an experiment with a water plant. He moved the torch to different points along the ruler and counted the number of bubbles given off by the water plant at each point.



His results are as shown.



(a) Based on the results, state the relationship between the distance of the plant from the torch and the rate of photosynthesis. [1]

_____

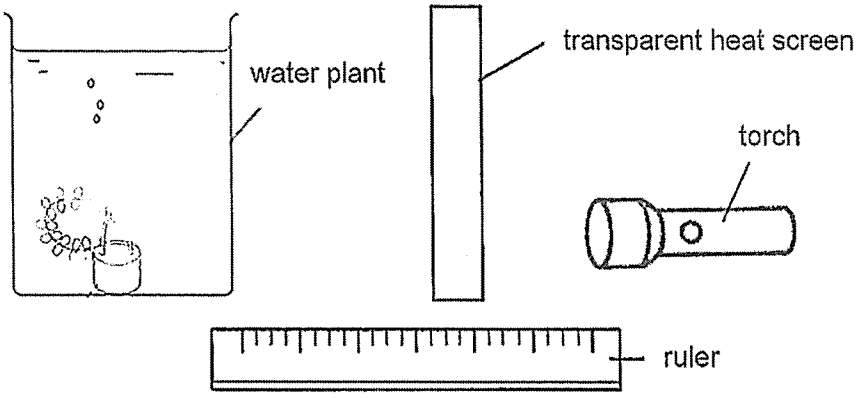
_____

_____

(Go on to the next page)

(b) Based on the results, at which distance should Ted place the light source in order for the water plant to grow well? Explain your answer. [2]

(c) Ted noticed that the torch gave out more and more heat as he conducted the experiment. He repeated the experiment with a transparent heat screen to absorb the heat



Suggest a reason why this was necessary. [1]

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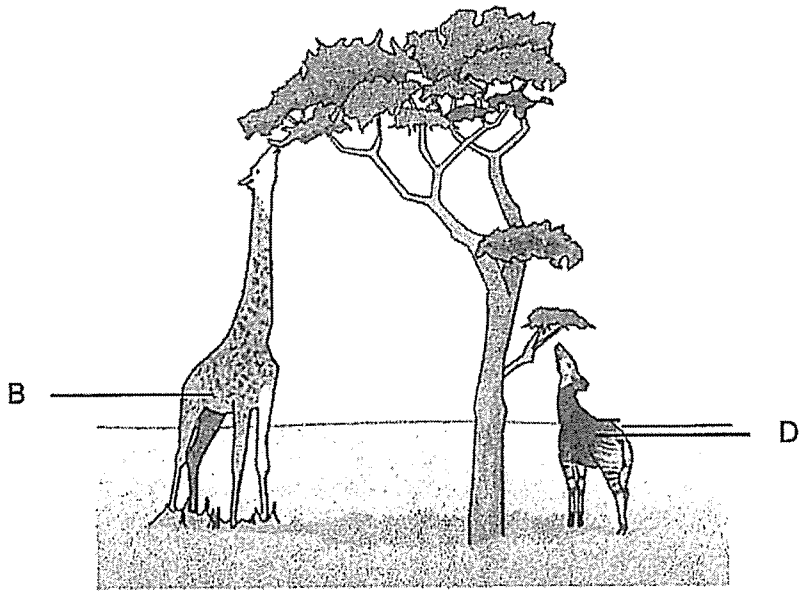
Score	/4

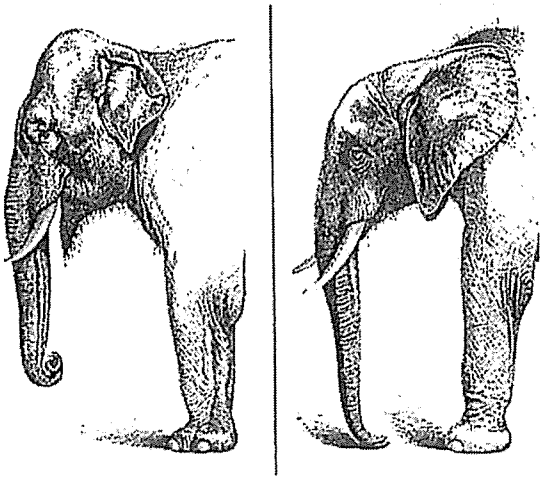
31 The diagram shows two animals, B and D living in a habitat with tall trees.



(a) Identify the animal that will survive better in this habitat. Explain why. [1]

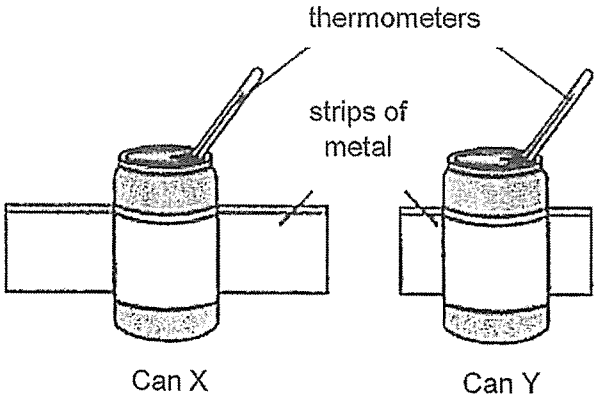
The size of the ears is another adaptation in animals such as the Asian elephant and African elephant.

Asian elephant



African elephant

Ben conducted an experiment to test this adaptation. He filled 2 similar cans with 200ml of hot water at 90°C. He wrapped strips of metal of different lengths around the cans as shown.



He recorded the temperature in each can every five minutes and presented the results in the table below.

Time (min)	Temperature of water (°C)	
	Can X	Can Y
0	90	90
5	84	88
10	78	82
15	70	79
20	66	75

(b) Based on the results, which elephant, Asian or African, is able to keep itself cooler? Explain why. [2]

(c) Suggest a suitable control set-up for this experiment. [1]

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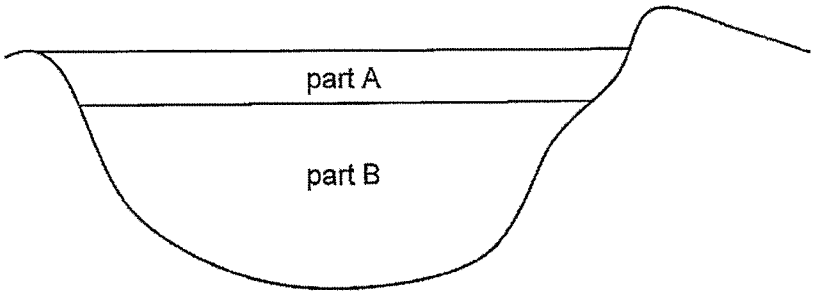
Score	/4

32 Organisms Y and Z live in a pond.



James observed them and recorded his observations in the table.

Organism	How they breathe	Where they are found	
		A	B
Y	Using air tube	✓	
Z	Using gills	✓	✓

(a) Describe how organism Z gets oxygen from the pond? [1]

Organism Y spreads diseases.

(b) Based on the information in the table, suggest and explain a way to prevent the increase of population Y. [1]

(Go on to the next page)

(c) The table shows the life cycle of organism Y at different temperatures.

Stage	Number of days in each stage of organism Y		
	25°C	30°C	35°C
Egg	2	2	1
Larva	8	4	4
Pupa	4	3	2
Adult	13	13	13

Using the information given, explain how global warming increases the spread of the diseases. [2]

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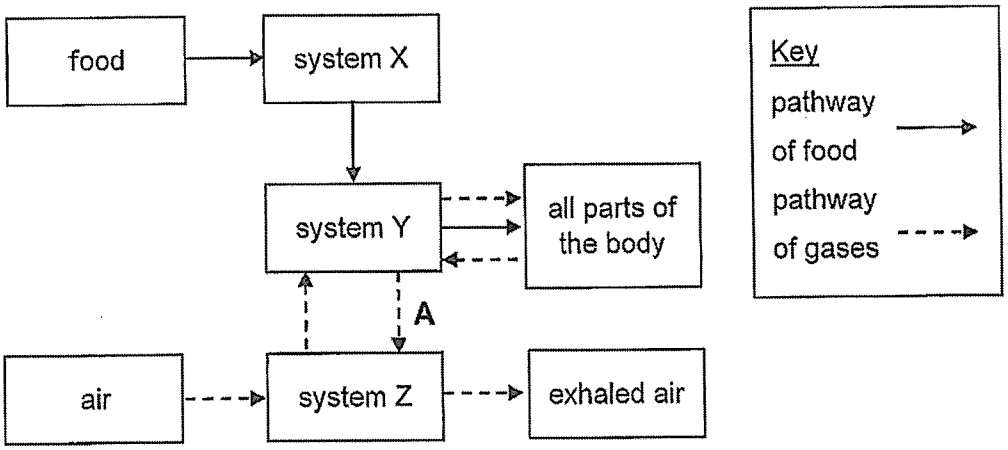
Score	/4

33 The diagram shows how food and gases are transported in the human body.



(a) Identify the following systems. [1]

X _____

Y _____

(b) One of the gases found in **A** is used by plants to carry out process T in the presence of light.
Name the gas and state the importance of process T to the plants. [1]

_____

_____

_____

(c) Describe the changes in system Y when someone exercises vigorously. [2]

_____

_____

_____

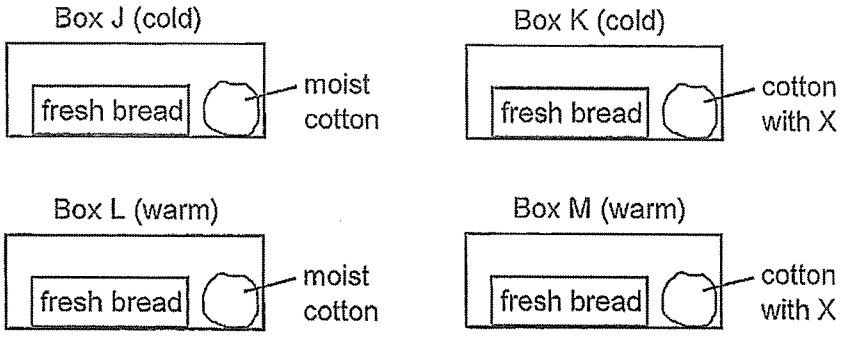
_____

_____

(Go on to the next page)

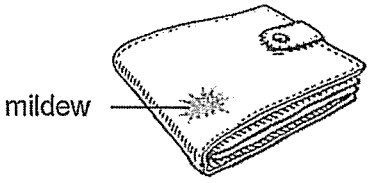
Score	/4

34 Jane placed four similar pieces of bread in four identical sealed boxes. She placed boxes J and K in a cold area and boxes L and M in a warm area. Substance X placed in the cotton absorbs water from the surroundings.



(a) In which box, J, K, L or M, would fungus appear first on the fresh bread? Explain your answer. [1]

(b) Mildew is a kind of fungus. Jane observed some mildew growing on her damp wallet.



Her mother advised her to put her wallet outdoors, under the hot sun for a few hours every day. Explain how, by doing so helps to prevent the growth of mildew on the wallet. [1]

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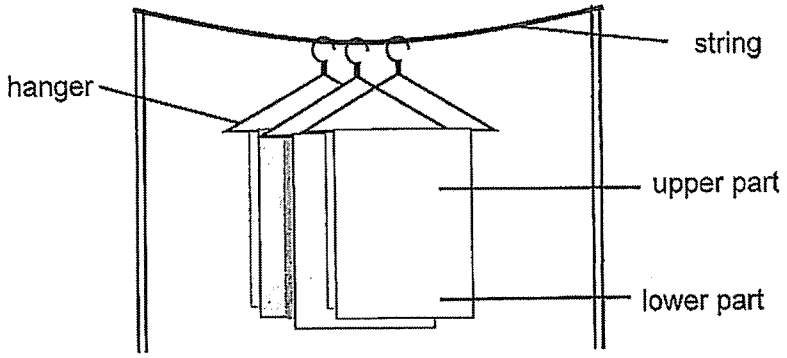
Score 2

35 Andy hung three wet towels, each with the same amount of water, on a string as shown.



Andy observed that the hangers moved closer towards the centre.

(a) Using property of materials, explain why. [1]

(b) How did this prevent his wet towels from drying quickly? [2]

After 2 hours, Andy observed that the upper part of the towels was drier than the lower part.

(c) Explain why the upper part was drier. [1]

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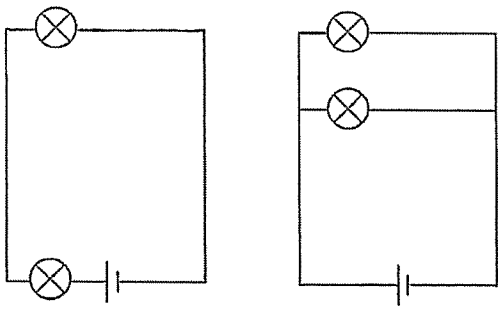
Score	/4

36 Benny set up two circuits as shown.

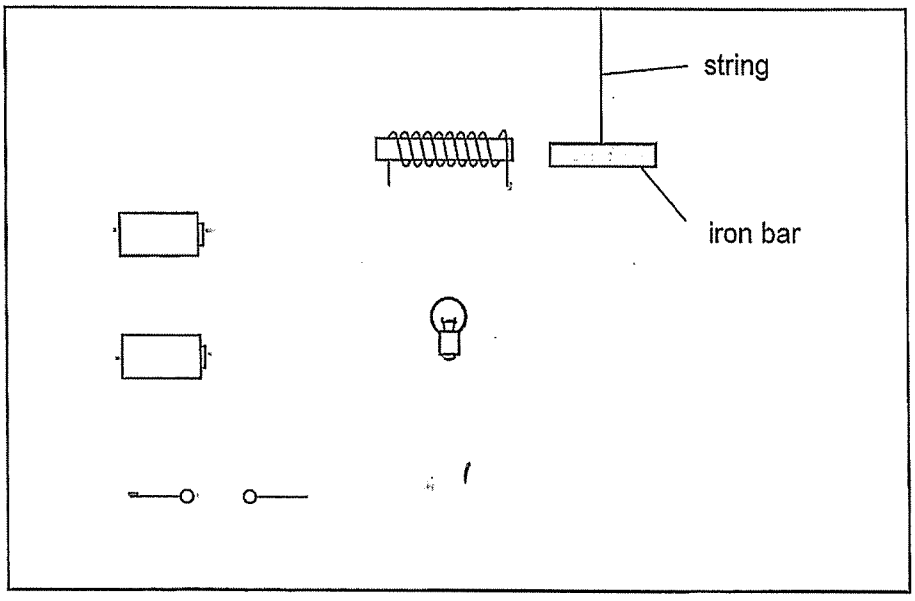


(a) Explain why the bulbs in circuit A light up less brightly than those in circuit B. [1]

_____

_____

(b) Draw a circuit such that the electromagnet can attract the iron bar and the bulb lights up the brightest. [2]



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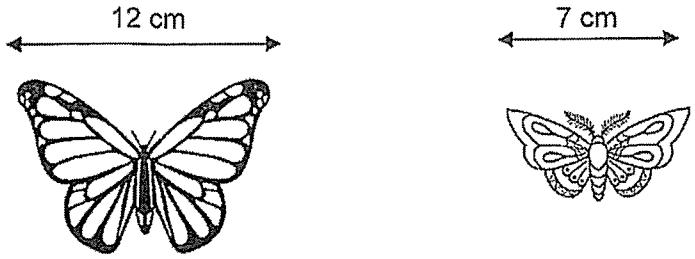
Score	/3

37 The diagram shows the wingspan of insect R and insect S.



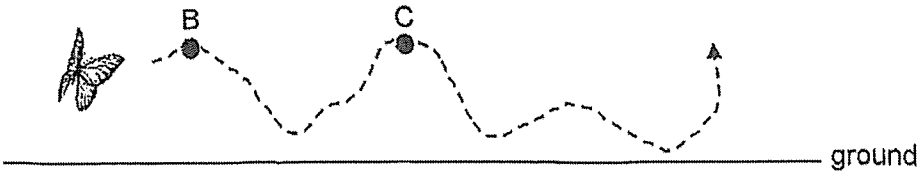
insect R insect S

The table shows how many times both insects beat their wings per second when flying.

Insect	Wingbeats per second when flying
R	10
S	15

(a) Explain, using the concept of forces, why insect R beats its wings less times per second even though it has a greater mass. [2]

It was observed that within a short distance, insect S moved in the way as shown.



(b) State the effect of a force as the insect beats its wings from B to C. [1]

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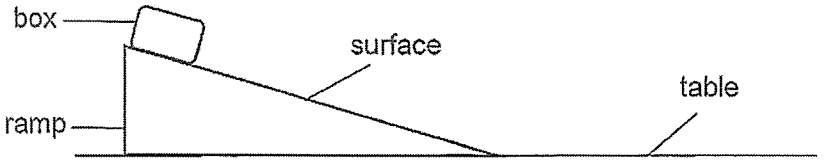
Score	/3

38 Charlie wanted to investigate which surfaces, A, B, C or D, is the safest to be used as a bathroom floor. He released a box from the top of a ramp as shown.



He recorded the distance that the box moved on the table. He repeated the experiment with different surfaces.

Surface	Distance moved (cm)	
	Try 1	Try 2
A	5.8	6.0
B	3.2	1.2
C	4.2	4.3
D	5.1	4.9

(a) What are the forces that acted on the box as it moved down? [1]

(b) Based on the information, which surface is the safest to be used as a bathroom floor? Explain. [2]

(c) Charlie's teacher suggested that he conducts the experiment again. Based on the results, explain why his teacher made the suggestion. [1]

(d) The bathroom floor is designed to slope a little towards the drain hole. How does this keep the user safe as he showers? [1]

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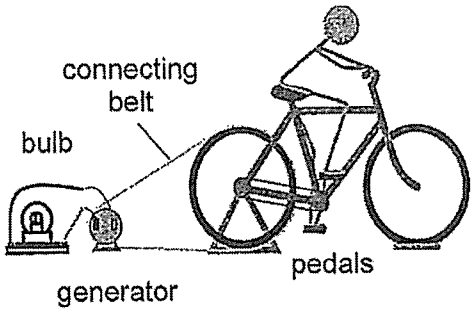
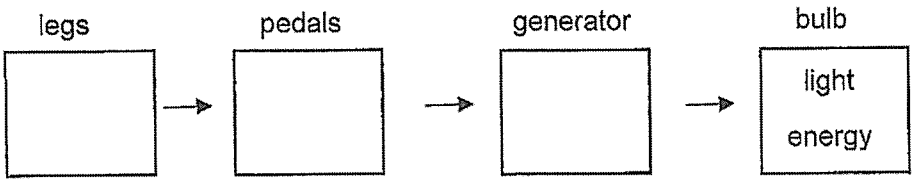
Score	/5

39 Darren pedalled on his stationary bicycle to light up a bulb as shown.



(a) Fill in the boxes to show the energy conversion as he pedalled [1]



(b) After some time, Darren pedalled slower. How did this cause the bulb to become become dimmer? Explain in terms of energy conversion. [1]

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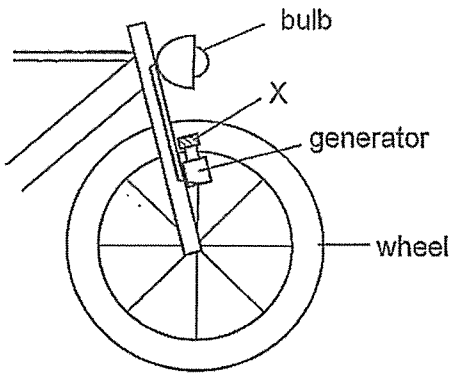
The diagram shows part of a bicycle where a similar system is used. Part X of the generator touches the wheel. This causes the bulb to light up in the end.



(c) Besides pedalling continuously, give another disadvantage of using this system. [1]

_____

_____

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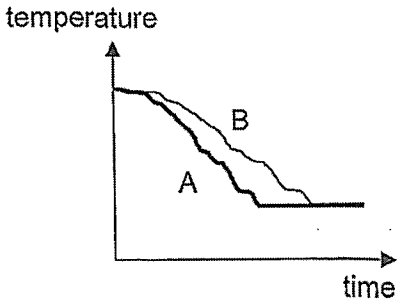
Score	/3

40 Ivan wanted to compare the effect of using two different materials to keep food hot for a longer time. He investigated using two bags, A and B, by measuring the temperature with the food inside each bag. His results are as shown.



(a) Based on the results, explain why Ivan chose bag B. [2]

(b) Ivan observed that the food in bag B turned soggy slower. Explain why. [2]

End of Paper

Check your work

Score	4

Name: _____( )

Class: _____

Corrections template

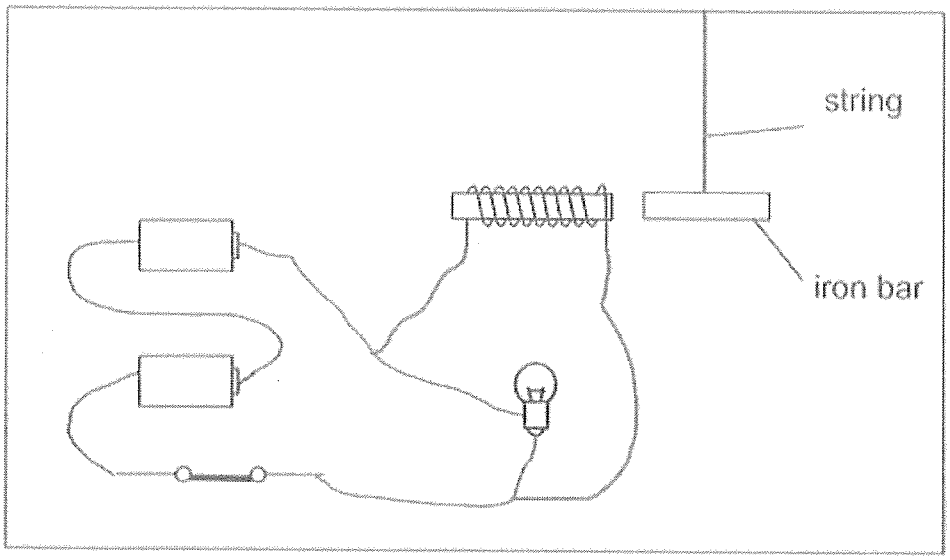
Year: 2024 Science Examination: Preliminary Level/Subject: P6

Booklet A

Qn	Ans	Qn	Ans	Qn	Ans	Qn	Ans	Qn	And	Qn	Ans
1	1	6	3	11	3	16	1	21	4	26	1
2	3	7	1	12	4	17	1	22	1	27	1
3	2	8	1	13	2	18	4	23	4	28	1
4	1	9	3	14	2	19	1	24	3		
5	4	10	2	15	2	20	3	25	2		

Qn/	Booklet B	Marks
29a	The transfer of pollen grains from the anther to the stigma.	1
29b	As the bee enters the flower, it brushes against D, the anther and pollen grains are transferred to the body of the bee, when the bee leaves the flower, pollen grains on its body gets transferred to the stigma.	2
29c	The female parts of the flower F (stigma, style, ovary, and ovule) have been removed. So fertilisation cannot occur, so no fruits can be formed.	1
30a	As the distance of the plant from light source increases, the rate of photosynthesis decreases.	1
30b	C - 10cm, E – as the number of oxygen bubbles produced is the highest. R – At 10cm, his plants will get the mouth amount of light to photosynthesise fastest to make the most food.	2
30c	To ensure that the only variable that affects the number of bubbles released [MV] is the light intensity [CV] and not heat [variable given in the question].	1
31a	C - Animal B. E - B has a long neck; R - that helps B to reach for more food from the taller part of the trees where D cannot.	1
31b	C – African elephants. E – Temperature in Can X, with longer strips of metal, reduces faster than Can Y, R – so bigger ears with larger exposed surface area allows more heat to be lost.	2

31c	A similar can without the metal strips.	1
32a	As dissolved oxygen in the water passes through the gills, the oxygen gets absorbed into the __blood__ and is transported to all parts of Z.	1
32b	C – Apply a layer of oil; E – As Y breathes through __air__ __tubes__, R – Oil blocks air from entering Y's breathing tube, so Y does not get air and they die.	1
32c	Global warming leads to the __increase__ __ of the earth's temperature. As the temperature increases, the number of days taken to complete one life cycle from egg to adult, __decreases__. Thus, there will be a __bigger__ population of Y to spread diseases.	2
33a	X – Digestive Y – Circulatory	1
33b	Name of gas – Carbon dioxide Process T is photosynthesis, which provides/makes __food__ for the plant.	1
33c	The heart pumps blood __faster__, to transport more __oxygen__ and digested food in the blood, to release more __energy__ to all parts of his body.	2
34a	C – L E – In L, the moist cotton provides the water and the box is placed in a warm place so R – since __water__ and __warmth__ are necessary for fungus to grow, fungus will appear first on L.	1
34b	Heat from the sun will dry out the wallet, thus removing __water__ which is necessary for fungus to grow.	1
35a	The string is __flexible__, so the mass of the wet towels pulls the string down.	1
35b	The towels are closer to each other, so they are exposed to __less__ wind. Therefore, the rate of evaporation is __slower__.	2
35c	Water from the upper part was pulled downward by __gravity__. Therefore, __less__ water remains at the upper part to be evaporated.	1
36a	The bulbs in circuit A are arranged in __series__ while those in B are arranged in parallel. Therefore, there is __less__ electric current flowing through each bulb in A.	1

36b		2
37a	The surface area of the wings of insect R is __bigger__ than S, So each beat uses more __force__ to push more air.	2
37b	The force can change the __direction__ of the insect.	1
38a	Gravitational and frictional force	1
38b	C - Box B E - The box moved the __shortest__ distance, R – so the frictional force between the box and surface is the most and it is the (best) at preventing a person from slipping.	2
38c	The results for Try 1 and 2 for box B are very different. So Charlie should repeat the experiment one more time to check that the result is __reliable__.	1
38d	There is __less__ friction between the user and the bathroom floor as water acts as a lubricant.	1
39a	Kinetic → kinetic → electrical	1
39b	Less kinetic energy from his legs is converted to less kinetic energy of the pedals, which is converted to less electrical energy of the generator and is converted to __less__ light energy of the bulb.	1
39c	Friction between part X and the wheel will cause more __wear__ and tear of the wheel.	1

40a	E - The temperature __decreases__ in bag B slower than in bag A. R- Bag B is a __poorer__ conductor of heat so it transfers heat from food to surroundings / outside __slower__.	2
40b	Less water vapour __condensed__ on the food, as the surface of the food is __warmer__.	2