

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
Additio	nal Materials: Optical Answer Sheet (OAS)	

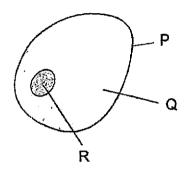
INSTRUCTIONS TO CANDIDATES

- 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)

1 The diagram shows an animal cell.



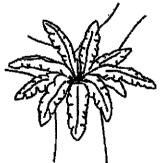
Which of the labelled structures are also found in a root cell?

	Р	Q	R
(1)			V
(2)			X
(3)	√	X	V
(4)	Х	×	V

Key	
7	present
Х	absent

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



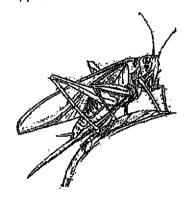


- (1) Both are plants.
- (2) Both grow only on trees.
- (3) Both reproduce from spores.
- (4) Both cannot make their own food.

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

Characteristics	D	Е	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

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

(minutes)

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

(2)

(4)

Heart rate (1) (beats per minute) 120 100 80 60 40 20 Time 30

Heart rate (beats per minute) 120 100 80 60 40 20 -Time 0 20 10 (minutes)

Heart rate (3) (beats per minute) 120 100 80 60 40 20 Time 10 20 (minutes) Heart rate (beats per minute) 120 100 80 60 40 20 Time 30 10 20 (minutes) . 5 The table shows the characteristics of two organisms, A and B, living in the same environment.

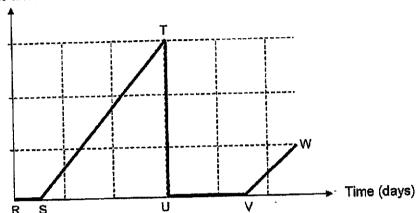
Organism	Characteristics
Α	Needle-like leaves Swollen stems Presence of chloroplasts in the stem
В	Large earsHides in burrows in the dayHunts only at night

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	

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

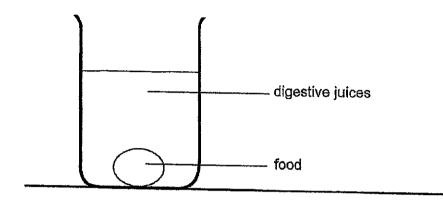
Amount of movement from one place to another



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.



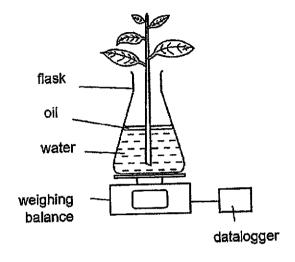
She repeated the experiment with different volumes of digestive juices and different amounts of food as shown in the table.

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

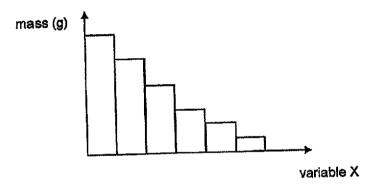
Which two experiments should she use to conduct a fair test?

- (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.



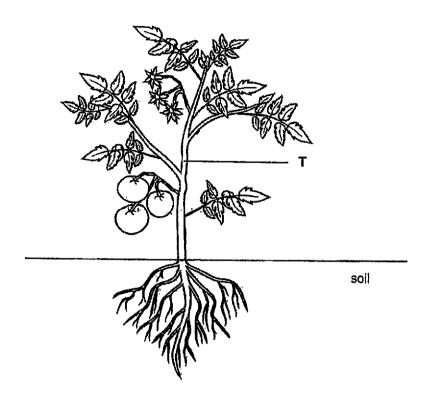
Samuel presented his findings in the graph shown.



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

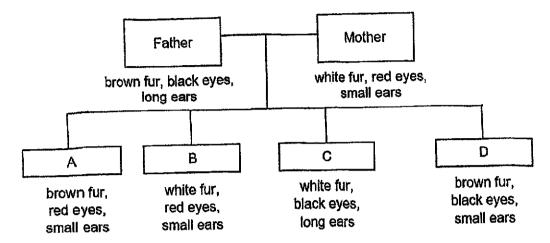
9 The diagram shows a plant.



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

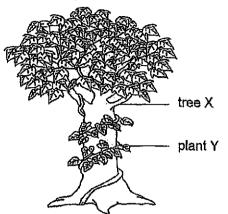
10 The diagram below shows some characteristics of a family of rabbits.



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 _____.

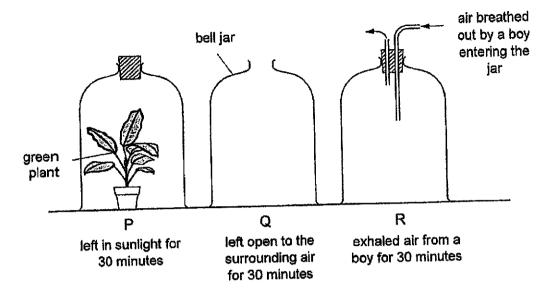
- (1) water directly when it rains
- (2) more fertiliser
- (3) sunlight
- (4) oxygen
- 12 The diagram shows a type of pollution.



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

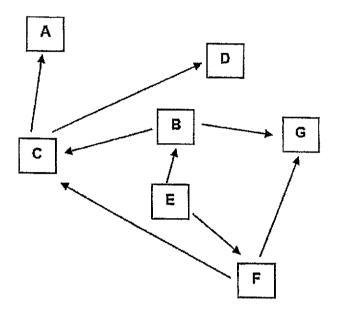
13 Three glass bell jars were set up as shown.



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

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

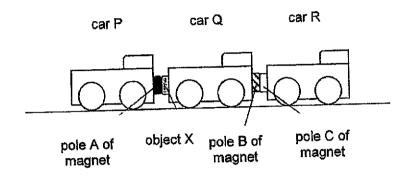
14 The diagram shows part of a food web.



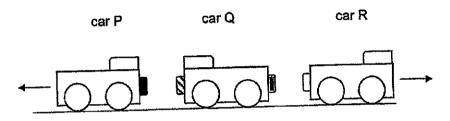
What is most likely to increase the size of population C?

- (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.



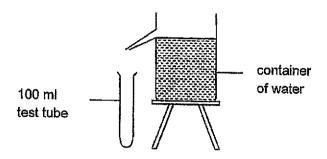
When he turned car Q around, car P moved to the left, car Q remained and car R moved to the right as shown.



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

X	Α	В	С
magnet	S	S	S
	N	N	S
<u> </u>	S	N	S
	S	S	N
	magnet magnet magnetic material magnetic material	magnet N magnetic material S	magnet S S magnet N N magnetic material S N

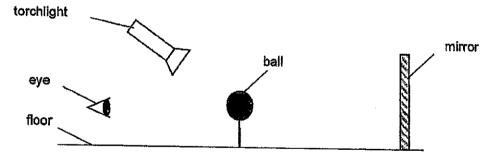
16 Sam wants to pour another 200 ml of water into the container of water as shown.



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.

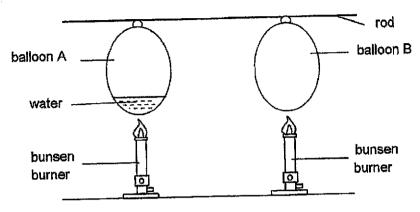
17 In a dark room, Ted shone light onto a ball as shown and made some observations.



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?

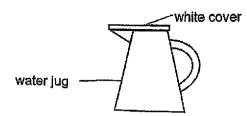
- (1) The air expanded faster in balloon A than B.
- (2) Balloon A has water which absorbed all the heat.
- (3) The air in balloon A gained heat faster than balloon B.
- (4) The air in Balloon A gained heat slower than the air in balloon B.
- 19 The table shows the freezing and boiling points of four different substances.

Substance	Freezing point (°C)	Boiling point (°C	
A	0	100	
B	17	118.1	
	5.5	80.2	
<u>_</u>	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.

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.

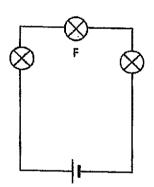


Based on the properties shown, which material should the jug be made of?

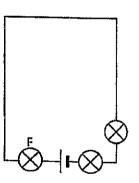
	Material	waterproof	strong	allows light to pass through
(1)	J		×	—
(2)	К	31		-
(3)	L			
(4)	M			*

21 In which circuit will bulb F be the brightest?

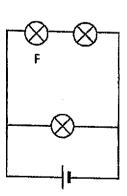
(1)



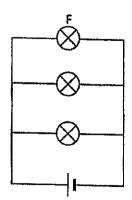
(2)



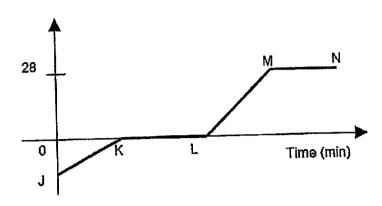
(3)



(4)



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



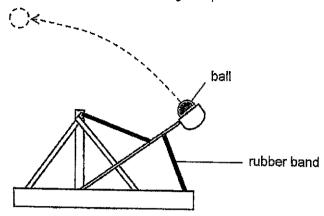
Which of the following statements are correct?

- 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?

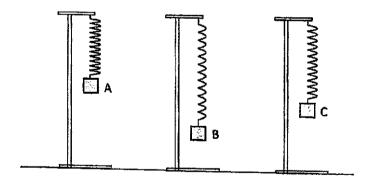
- (1) sun
- (2) wind
- (3) water
- (4) candle

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



Which of the following energy conversions is correct?

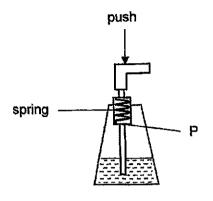
- (1) kinetic energy → potential energy
- (2) kinetic energy heat + sound energy
- (3) potential energy → kinetic energy → potential energy
- (4) potential energy → sound energy + heat energy → kinetic energy
- 25 Zara hung three objects, A, B and C, on identical springs as shown.



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.

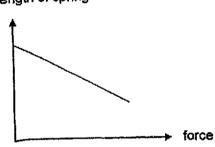
26 The diagram shows a soap bottle with a pump. The spring cannot move below part P.



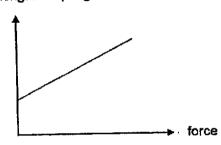
Which of the graphs correctly shows the relationship between the push force and length of the spring?

(4)

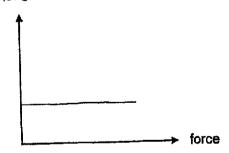
(1) length of spring



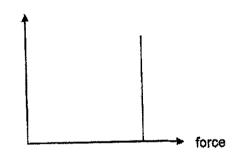
(2) length of spring



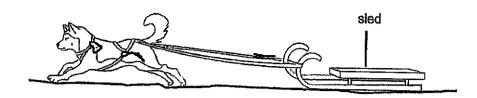
(3) length of spring



length of spring

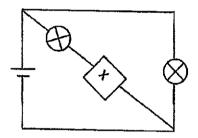


27 The diagram shows a dog pulling a sled across the ground.



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)



A Methodist Institution (Founded 1886)

PRELIMINARY EXAMINATION 2024 SCIENCE **PRIMARY SIX BOOKLET B**

Name:	()	Class: Primary 6
Date: 20 August 2024		Total Tin	ne 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.
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- 4. Answer all questions.
- 5. Write your answers in this booklet.

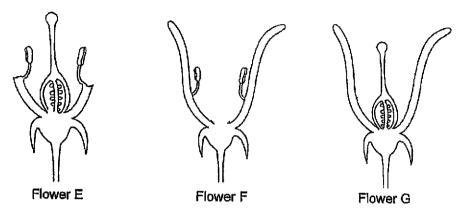
BOOKLET	MAX MARKS	MARKS OBTAINED
A	56	
В	44	
Total	100	

This booklet consists of 18 printed pages including this cover page.

20 to 42 write your apprecs in this hooklet. The number of marks	avallable is
For questions 29 to 40, write your answers in this booklet. The number of marks	(44 marks)
shown in brackets [] at the end of each question or part question.	

	ckets [] at the end of each dassage of the first	[1
(a)	State what pollination means.	
		
The e	diagram shows a cross-section of a flower.	
i ne c	giagram shows a cross society of the	
	\\ \n \(\lambda \)	
	bee	
	V \ \ V	
(b)	It was observed that a bee was found inside the flower. Describe the role of the bee in the pollination of this flower.	
	Describe the fole of the beein the political of the	

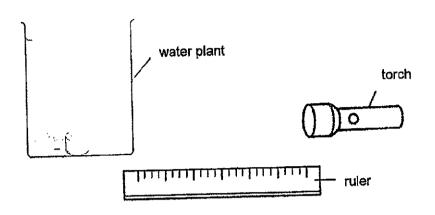
(c) Fred wanted to find out if a fruit can still be produced with certain parts of the flower removed. He labelled the three flowers, E, F and G, from the same plant and removed a certain part from each of the flowers.



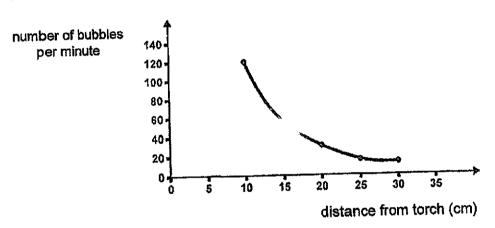
Explain why Fred noticed that flowers E and G had developed into fruits buflower F after a few weeks.	t not [1]

Score	4
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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.



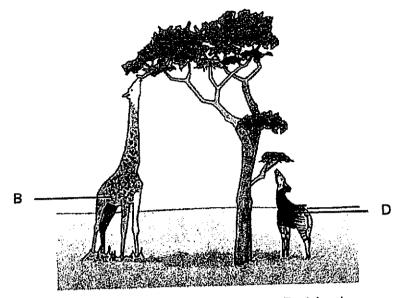
(a)	Based on the results, state the relationship between the distance of the plant from the torch and the rate of photosynthesis.	1

Ted noticed that the torch gave out more and more heat experiment. He repeated the experiment with a transparent the heat	as he conducted heat screen to ab
water plant transp	torch o ruler
Suggest a reason why this was necessary.	

(Go on to the next page)

Score

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]

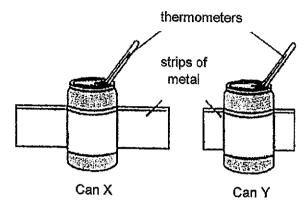
The size of the ears is another adaptation in animals such as the Asian elephant and African elephant.

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.

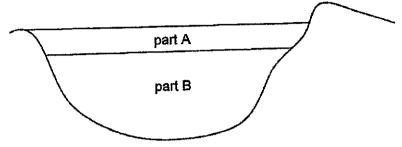


He recorded the temperature in each can every five minutes and presented the results in the table below.

Time (min)	Temperature of water (°C)	
Turie (IIIIII)	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 a Explain why.	able to keep its	self cooler? [2]
			,
(c)	Suggest a suitable control set-up for this experiment.		[1]
		(Go on to th	e next page)
		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	В
Υ	Using air tube	✓	
Z	Using gills	✓	/

(a)	Describe how organism Z gets oxygen from the pond?	[1]
Organisr	n Y spreads diseases.	
(b)	Based on the information in the table, suggest and explain a way to pr the increase of population Y.	event [1]

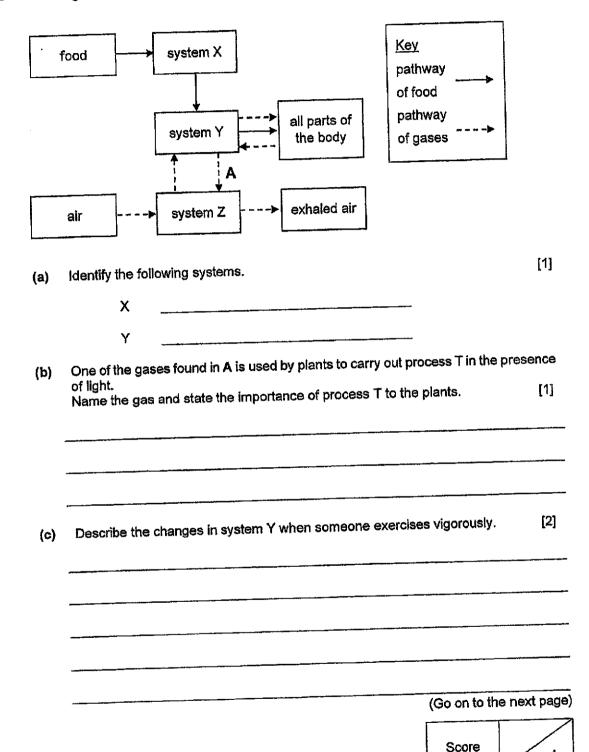
(c) The table shows the life cycle of organism Y at different temperatures.

Stage	Number of da	ys in each stage o	of organism
otago	25°C	30°C	35°C
Egg	2	2	1
Larva	8	4	4
Pupa	4	3	2
Adult	13	13	13

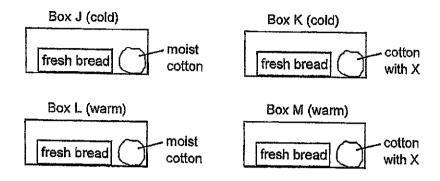
Using the information given, explain how global warming increases the diseases.	the spread of [2]

Score	4
	1/ + 1

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

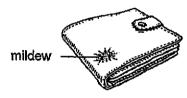


Jane placed four similar pieces of bread in four identical sealed boxes. She placed boxes J and K in a cold area and boxes L and M in a warm area. Substance X placed in the cotton absorbs water from the surroundings.

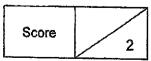


(a)	In which box, J, K, L or M, would fungus appear first on the fresh bread? Ex	plain your
	answer.	[1]

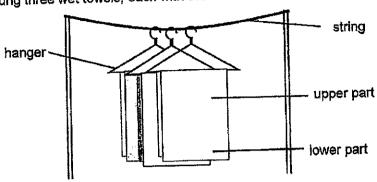
(b) Mildew is a kind of fungus. Jane observed some mildew growing on her damp wallet.



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.



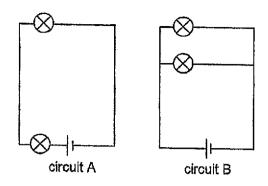
35 Andy hung three wet towels, each with the same amount of water, on a string as shown.



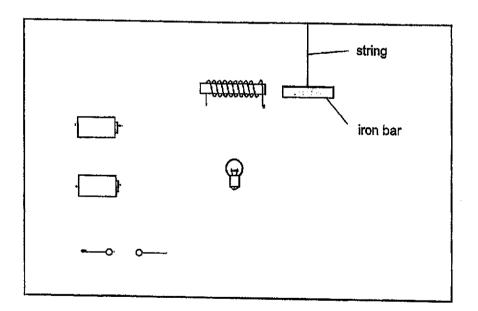
Andy (a)	observed that the hangers moved closer towards the centre. Using property of materials, explain why.	[1]
(b)	How did this prevent his wet towels from drying quickly?	[2]
Afte part (c)	or 2 hours, Andy observed that the upper part of the towels was drier than the Explain why the upper part was drier.	e lower [1]

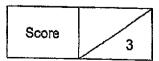
0	
Score	4

36 Benny set up two circuits as shown.

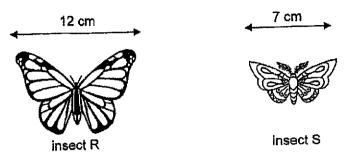


- (a) Explain why the bulbs in circuit A light up less brightly than those in circuit B. [1]
- (b) Draw a circuit such that the electromagnet can attract the iron bar and the bulb [2] lights up the brightest.





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

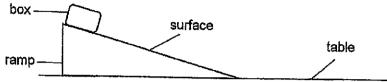


The table shows how many times both insects beat their wings per second when flying.

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]
t was	s 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]
	(Go on to the nex	kt page
	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.

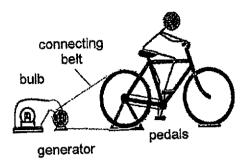
Surface	Distance moved (cm)	noved (cm)
	Try 1	Try 2
Α	5.8	6.0
В	3.2	1.2
C	4.2	4.3
D	5.1	4.9

(a)	vvnat 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 [2] floor? Explain.
- (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?

Score	5
	5

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



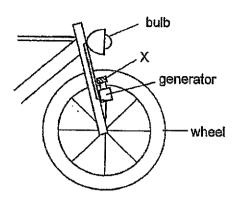
(a) Fill in the boxes to show the energy conversion as he pedalled

legs pedals generator bulb

light energy

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

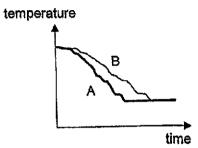
The diagram shows part of a bicycle where a similar system is used. Part X of the generator touches the wheel. This causes the bulb to light up in the end.



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

Score	3
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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.



•	Ivan observed that the food in bag B turned soggy slower. Explain why.	[2
		····

End of Paper Check your work

Score 4

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Class:			
	Con	rections template	
Year: <u>2024</u>	Scienc	e Examination: <u>Preliminary</u>	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	+
3	2	8	1	13	2	18	4	23	4	28	1
4	1	9	3	14	2	19	1	24	3	designation (appropriately services of	
5	4	10	2	15	2	20	3	25	12		

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 <u>D</u> , the anther and pollen grains are transferred to the body of the bee,	2
	when the bee <u>leaves</u> the flower, pollen grains on its body gets transferred to the stigma.	
29c	The <u>fernale</u> parts of the flower F (stigma, style, ovary, and ovule) have been removed. So <u>fertilisation</u> 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 <u>highest</u> . R - At 10cm, his plants will get the <u>mouth</u> 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].	
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,	1
	the oxygen gets absorbed into the <u>blood</u> and is transported to all parts of Z.	
32b	C – Apply a layer of oil;	1
	E - As Y breathes through <u>air tubes</u>	
	R - Oil blocks air from entering Y's breathing tube, so Y does not get air and they die.	
32c	Global warming leads to the <u>increase</u> of the earth's temperature.	2
	As the temperature increases, the number of days taken to complete one life cycle from	
	egg to adult, _decreases	
	Thus, there will be a <u>bigger</u> population of Y to spread diseases.	
33a	X – Digestive	1
	Y - Circulatory	
33b	Name of gas - Carbon dioxide	1
	Process T is photosynthesis, which provides/makes <u>food</u> for the plant.	
33c	The heart pumps blood <u>faster</u> , to transport more <u>oxygen</u> and digested food in	2
	the blood, to release more energy to all parts of his body.	アイスの表現の表現の表現である アンカ 単立
34a	C-L	1
	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.	
34b	Heat from the sun will dry out the wallet, thus removing water which is necessary	1
	for fungus to grow.	1,440 all 2010
35a	The string isflexible, 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 <u>less</u> wind.	2
	Therefore, the rate of evaporation is <u>slower</u> .	
35c	Water from the upper part was pulled downward by gravity	1
	Therefore, less water remains at the upper part to be evaporated.	
36a	The bulbs in circuit A are arranged in series while those in B are arranged in parallel.	1
	Therefore, there is <u>less</u> electric current flowing through each bulb in A.	1

36b		·
	string iron bar	2
37a	The surface area of the wings of insect R is <u>bigger</u> than S, So each beat uses more <u>force</u> to push more air.	2
37b	The force can change the <u>direction</u> of the insect.	1
Haratti v da nimera me i gara i nasaka v		
38a	Gravitational and frictional force	1
38b	C - Box B	
	E - The box moved the shortest distance,	2
	R - so the frictional force between the box and surface is the most and it is the	
	(best) at preventing a person from slipping.	
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	1
	reliable	
38d	There is <u>less</u> friction between the user and the bathroom floor as water acts as a	1
	lubricant.	*
39a	Kinetic → kinetic → electrical	1
39b	Less kinetic energy from his legs is converted to less kinetic energy of the pedals,	1
	which is converted to less electrical energy of the generator and is converted to less	E Printingson 11
	light energy of the bulb.	
39c	Friction between part X and the wheel will cause more wear and tear of the	1
	wheel.	•
alle ar a midue personapai.	L. Carrier and Car	

40a	E - The temperature decreases in bag B slower than in bag A.	2
-146	R- Bag B is a poorer conductor of heat so it transfers heat from food to	
	surroundings / outside slower	
40b	Less water vapour condensed on the food,	2
	as the surface of the food is <u>warmer</u>	
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