SA2

Name: _____ ( )

Class: Primary 6 _____

CHIJ ST NICHOLAS GIRLS' SCHOOL

Primary 6
Preliminary Examination

SCIENCE

BOOKLET A

26 August 2021

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

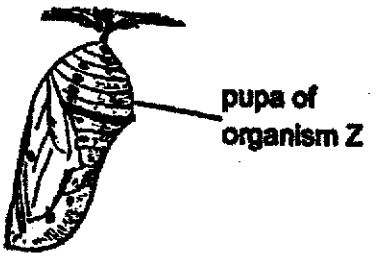
28 questions
56 marks

Do not open this booklet until you are told to do so.
Follow all instructions carefully.
Answer all questions.

This booklet consists of 17 printed pages.

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

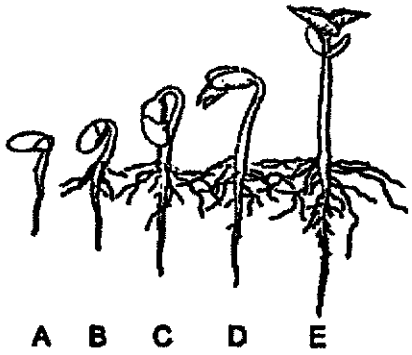
1. Benny found the pupa of organism Z on a tree branch as show below.



Which of the following could organism Z be?

(1) butterfly
(2) mosquito
(3) cockroach
(4) grasshopper

2. The diagram below shows the growth of a bean plant.



At which stage (s) is / are sunlight required for it to grow healthily?

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

3. The table below shows cells P, Q, R and S. A tick (✓) shows that the cell part is present.

	P	Q	R	S
Cell membrane	✓	✓	✓	✓
Cell wall			✓	✓
Chloroplast			✓	
Cytoplasm	✓	✓	✓	✓
Nucleus	✓		✓	✓

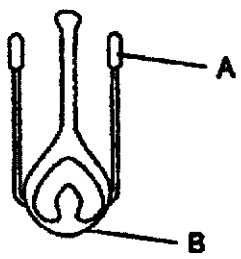
Four statements were made about the cells.

A Cells R and S are leaf cells.
B Cells P, R and S are able to reproduce.
C Cells P and Q do not have a regular shape.
D Cells P and Q cannot control substances moving in and out of them.

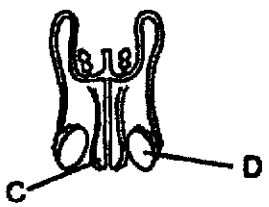
Which of the following statements are true?

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

4. The diagrams below show the reproductive parts of a plant and a human respectively.



plant

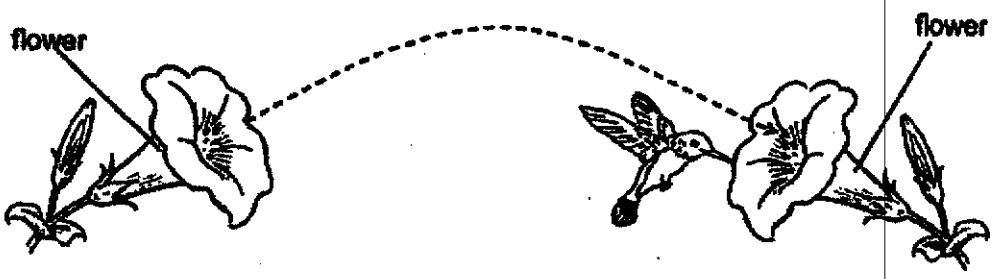


human

Which of the following parts have the same function?

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

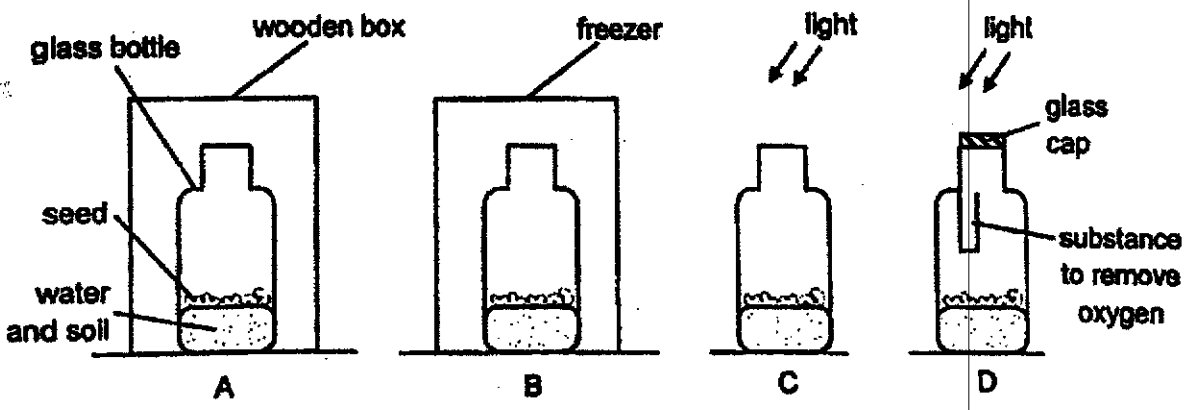
5. The diagram shows a bird as it flies from flower to flower of a plant.



Which of the following process is the bird helping out with?

(1) fertilisation
(2) germination
(3) pollination
(4) seed dispersal

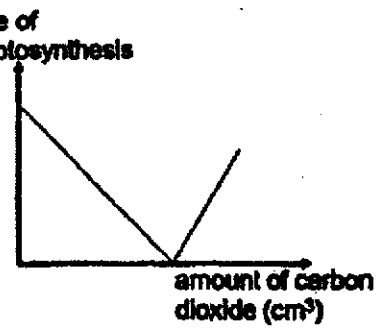
6. Rayken wanted to investigate the factors affecting germination with the four set-ups shown below. All the set-ups are given the same amount of soil and water.

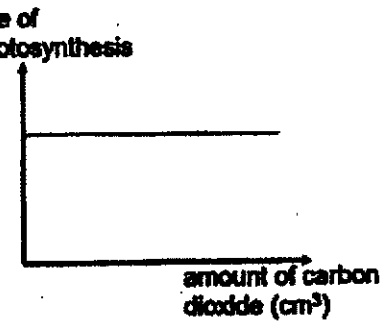


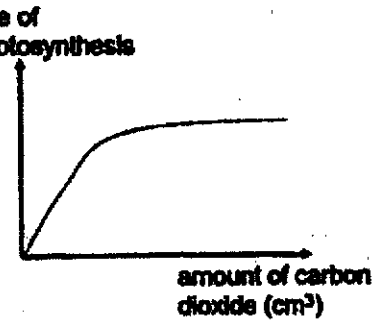
In which set-ups will the seeds most likely germinate?

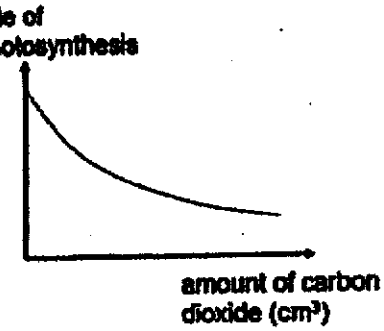
(1) A and B only
(2) A and C only
(3) B and D only
(4) C and D only

7. Which of the following graphs correctly shows how carbon dioxide affects the rate of photosynthesis?

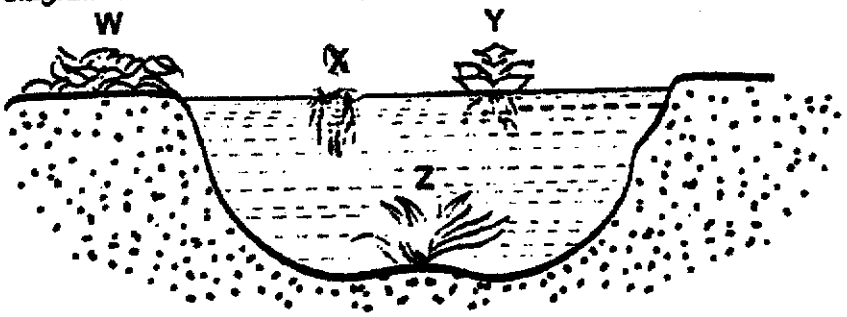
(1)


(2)


(3)


(4)


8. The diagram below shows some plants growing in and around a pond.



What will happen when plant X multiplies quickly?

(1) Plant Y will not be affected.
(2) Only plant Z will not grow well.
(3) Plant Y and Z will not grow well.
(4) Plants W, Y and Z will not grow well.

9. Which of the following statements are true for both the fern and bracket fungus?

A Both of them respire all the time.
B Both of them are non-flowering plants.
C Fern is able to make food but the bracket fungus cannot.
D Fern reproduces from seeds while bracket fungus reproduces from spores.

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

10. The table below shows some characteristics of three organisms X, Y and Z. A tick (✓) indicates the presence of the characteristic in the organism.

Characteristic	X	Y	Z
It makes its own food.		✓	
It has three body parts	✓		
It has hair on its body.			✓
It moves from place to place.	✓		✓

Which of the following is correct?

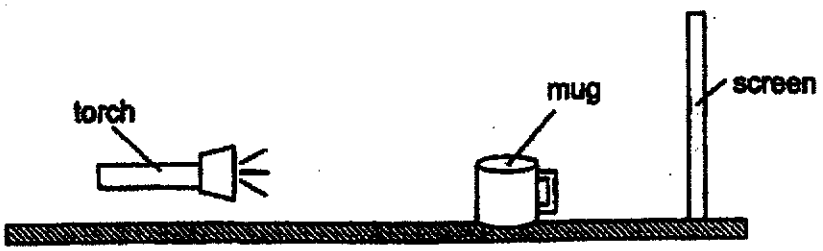
	X	Y	Z
(1)	ant	bacteria	bat
(2)	plant	bacteria	spider
(3)	butterfly	plant	dolphin
(4)	spider	plant	bat

11. Which of the following is / are not matter?

A air
B light
C cloud
D shadow

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

12. Study the diagram below.



The mug was rotated and placed at different positions between the torch and screen.
Which of the following shadows cannot be cast by the mug?

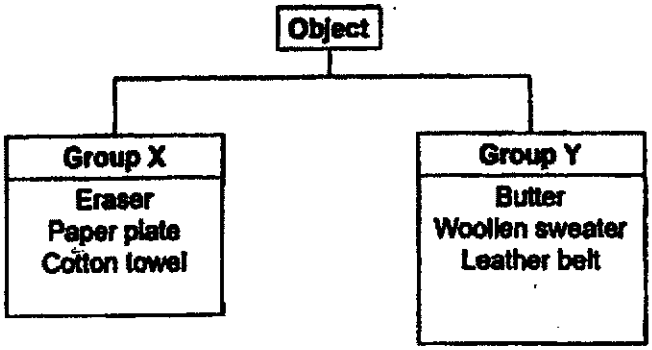
(1)

(2)

(3)

(4)

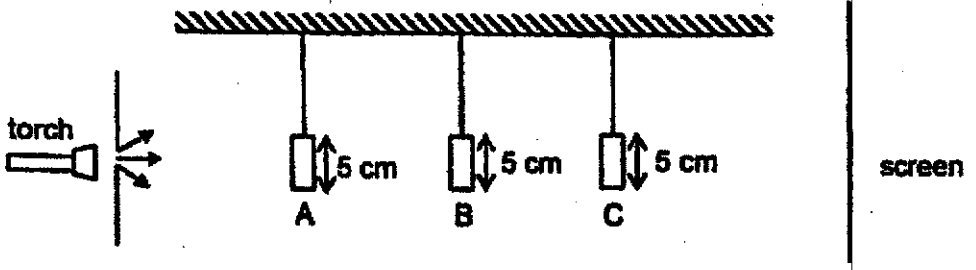
13. Study the classification chart below.



Which of the following shows the correct headings for the two groups?

	Group X	Group Y
(1)	weak	strong
(2)	opaque	transparent
(3)	waterproof	not waterproof
(4)	made of materials that comes from plants	made of materials that comes from animals

14. The diagram below shows light shining on three shapes A, B and C made of frosted glass, metal and wood respectively. They are placed at different distances from the torch.

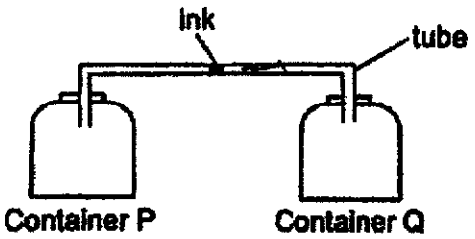


The diagram below shows the shadow cast on the screen.

Which of the following correctly represents shapes A, B and C?

	A	B	C
(1)	square	triangle	ring
(2)	square	ring	triangle
(3)	triangle	square	ring
(4)	triangle	ring	square

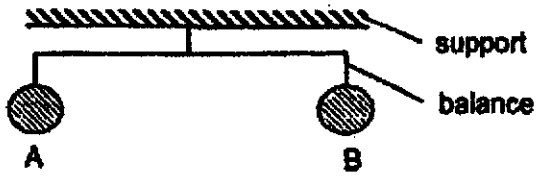
15. Two containers are connected by a tube as shown below.



When container Q was placed in a basin of ice cubes, the drop of ink in the tube will _____.

(1) freeze
(2) remain stationary
(3) move towards container P
(4) move towards container Q

16. Two similar metal balls A and B were hung on a balance as shown below.



Ball B was then heated for 5 min.

Which of the following shows the correct observation of the size of the ball B and the tilt of the balance after 5 min?

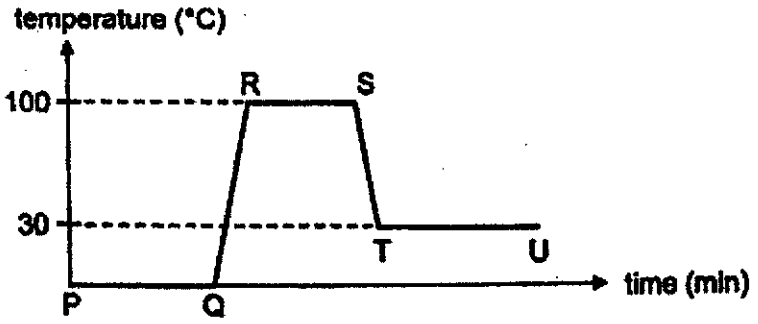
	Size of ball B	Tilt of balance
(1)	increased	tilt towards ball B
(2)	increased	remained balanced
(3)	remained the same	tilt towards ball B
(4)	remained the same	remained balanced

17. Two similar pieces of glass E and F were each placed in two rooms X and Y with different temperatures respectively.
After some time, both pieces of glass were brought to room Z and the observation of the glass pieces are shown in the diagram below.

Which of the following correctly compares the difference in temperatures of rooms X and Y in comparison to room Z?

	Temperature of room X	Temperature of room Y
(1)	Higher than room Z	Lower than room Z
(2)	Higher than room Z	Same as room Z
(3)	Lower than room Z	Lower than room Z
(4)	Lower than room Z	Same as room Z

18. The graph below shows some ice being heated. After some time, the heat source was turned off and water was left to cool.

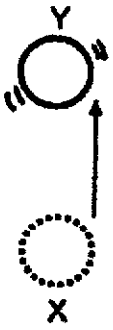


Based on the graph, which of the following statements are true?

A Boiling takes place at R.
B The room temperature was 30 °C.
C The heat source was turned off at R.
D There was no heat gain or heat loss from P to Q.

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

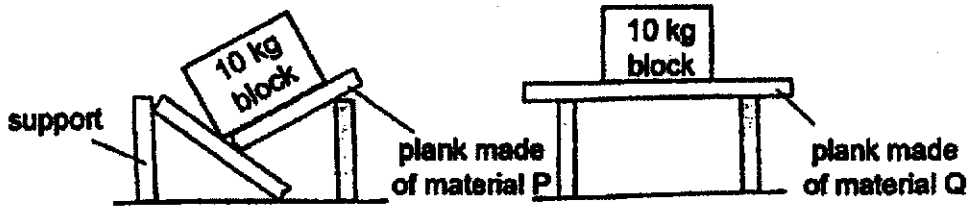
19. A ball was thrown upwards from position X as shown below. Position Y is the highest point the ball can reach.



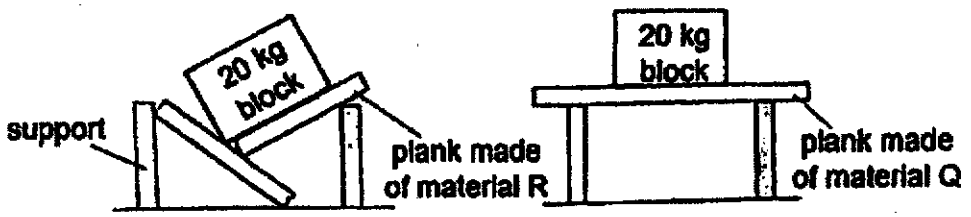
Which of the following is correct?

(1) No force is acting on the ball when it reached position Y.
(2) Gravitational force causes the ball to change its direction of motion.
(3) There is no frictional force acting on the ball when it moves from position X to Y.
(4) There is no gravitational force acting on the ball when it moves from position X to Y.

20. The diagram below shows the observation made when two similar 10-kg blocks were placed on two planks made of different materials P and Q.



The diagram below shows the observation made when two similar 20-kg blocks were placed on two planks made of different materials Q and R.



Which of the following statements about materials P, Q and R is / are correct?

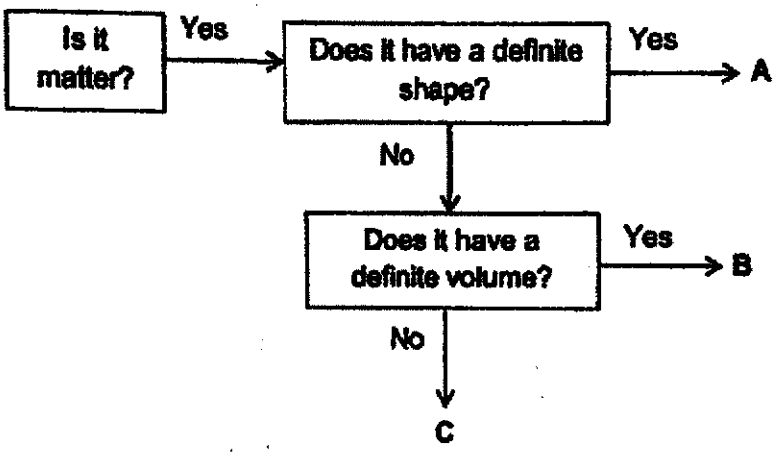
A Material Q is the strongest material.
B Material P is the weakest material.
C Material R is stronger than material P.
D Material R can support a 15-kg item without breaking.

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

21. The table below shows the characteristics of objects P and Q. A tick (√) represents the presence of the characteristic.

Characteristic	Object	
	P	Q
Occupies space	✓	✓
Can be compressed		✓
Takes the shape of the container it is in	✓	✓

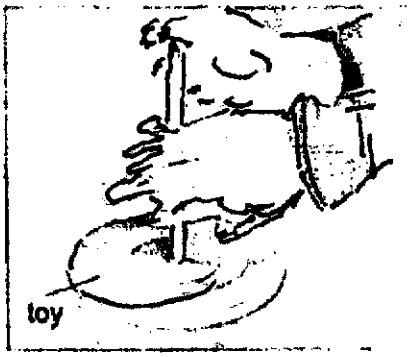
Objects P and Q can be represented by A, B or C in the chart shown below.



Based on the chart above, which letters A, B or C represent objects P and Q?

	Object P	Object Q
(1)	A	B
(2)	B	C
(3)	C	A
(4)	C	B

22. Jun Hao held a toy between his hands as shown. He rotated the toy by sliding one hand forward and the other hand backwards. The toy started rotating and stopped after a while.

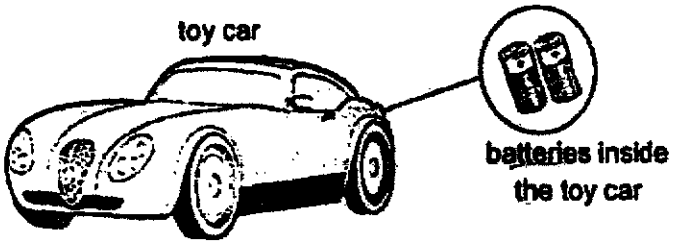


Jun Hao rotated the toy again with less force. This time, the toy did not rotate as long as before.

Which of the following statement explains this observation?

(1) The kinetic energy of the toy was lesser than before.
(2) The kinetic energy of the toy was converted to heat and sound energy.
(3) The gravitational potential energy was greater than the mass of the toy.
(4) The hand was gaining heat energy from the toy, causing the kinetic energy to decrease.

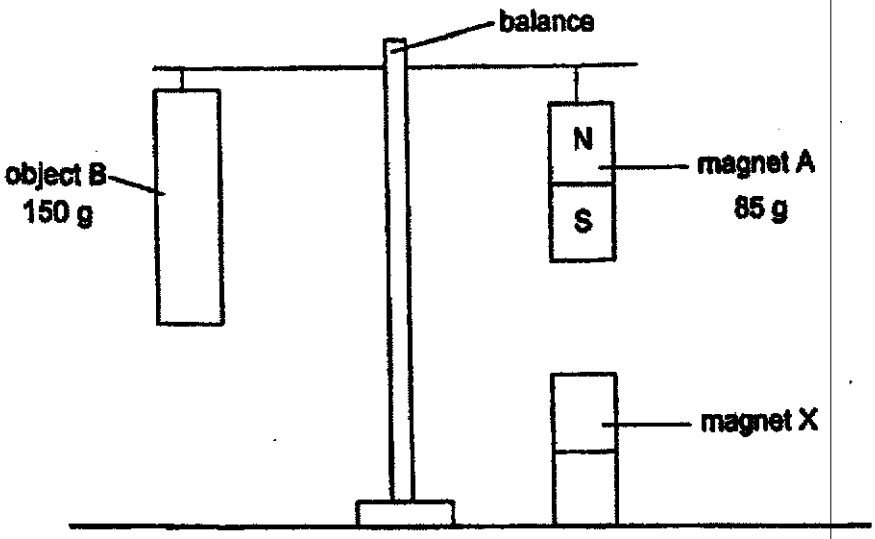
23. The diagram below shows a battery powered toy car.



Which of the following shows the correct energy conversion that enables the car to move?

(1) electrical energy → kinetic energy → heat and sound energy
(2) chemical potential energy → electrical energy → kinetic energy
(3) gravitational potential energy → electrical energy → kinetic energy
(4) kinetic energy → electrical energy → kinetic energy → sound energy

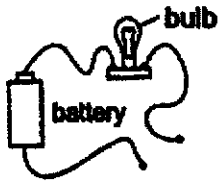
24. Lily set up the experiment as shown in the diagram below. The masses of magnet A and object B are 85 g and 150 g respectively. Magnet X is fixed to the table.



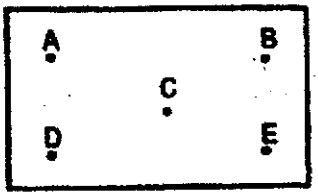
Which of the following explains how object B is balanced by magnet A?

	Poles of magnet X facing magnet A	Explanation
(1)	North	Unlike poles attract so Magnet A is pushed upwards to balance Object B.
(2)	South	Like poles repel so Magnet A is pushed upwards to balance Object B.
(3)	North	Unlike poles attract so Magnet A is pulled downwards to balance Object B.
(4)	South	Like poles repel so Magnet A is pulled downwards to balance Object B.

25. The circuit card shown below has a metal thumbtack at each end of the points A, B, C, D and E. Some of the thumbtacks are connected by wires behind the card.



circuit tester



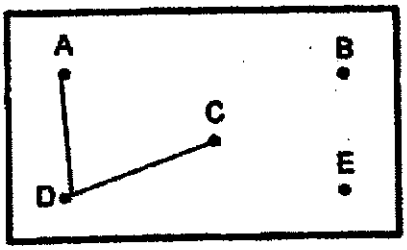
circuit card

Shaun wanted to find out how the thumbtacks are connected. He connected the two ends of the circuit tester to the thumbtacks and recorded the results as shown below.

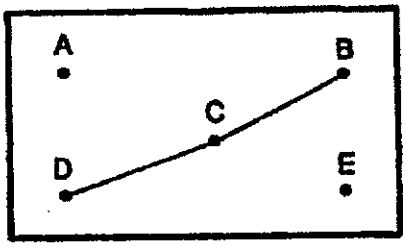
Circuit tester connected to thumbtacks at:	Does the bulb in the circuit tester light up?
A and E	No
B and C	Yes
C and E	Yes
D and A	No

From the result shown in the table above, which of the following is a possible arrangement of the wire behind the circuit card?

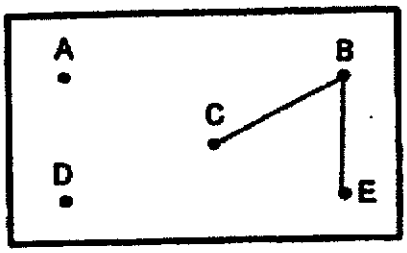
(1)



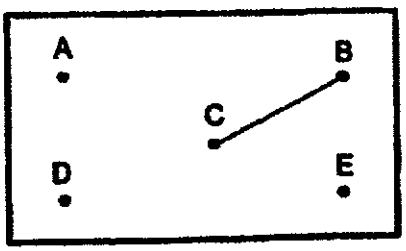
(2)



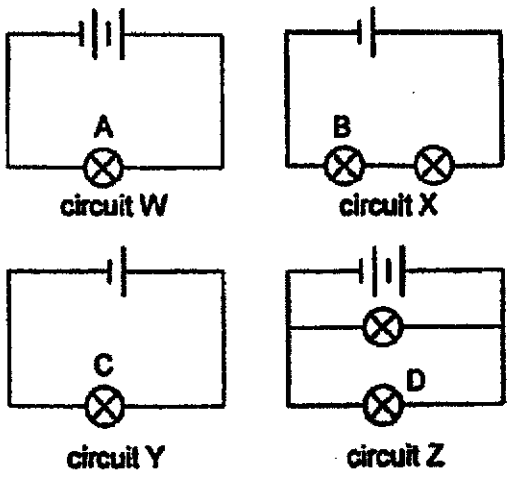
(3)



(4)



26. Study the circuits below. All the bulbs in the four circuits lit up.



Which of the following shows the correct brightness of bulbs A, B, C and D?

	Brightness of bulb		
	Low	Medium	High
(1)	A	B	C
(2)	B	C	A
(3)	C	B	D
(4)	C	A	B

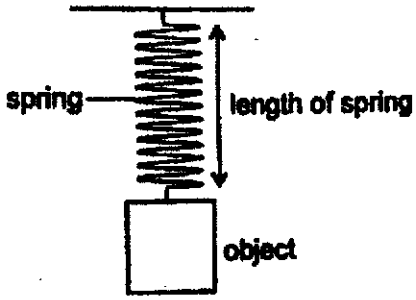
27. A ceiling fan converts electrical energy to kinetic energy to produce wind when the switch is turned on. The table below shows the electrical efficiency of different brands of ceiling fans.

Brand	Amount of electrical energy needed (units)	Amount of kinetic energy generated (units)
W	100	70
X	100	90
Y	150	50
Z	150	100

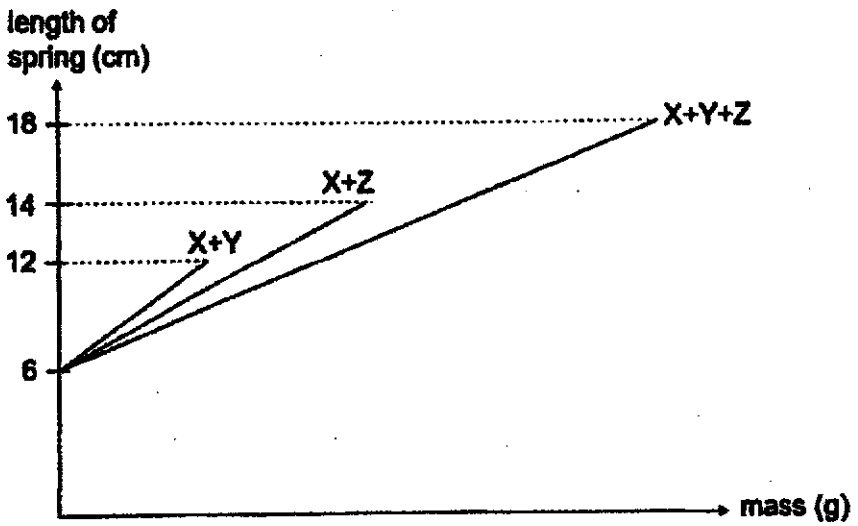
Which of the above brands W, X, Y or Z is the most energy-efficient?

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

28. Siti conducted an experiment on the extension of a spring using the set-up below. Objects X, Y and Z are of different masses.



She placed different combinations of objects X, Y and Z on the spring and measured the length of the spring. Her results are as shown below.



What would the extension of the spring be when only object Y was placed on the spring?

(1) 2 cm

(2) 4 cm

(3) 6 cm

(4) 12 cm

~End of Booklet A~

Name : _____ ( )

Class : Primary 6 _____

CHIJ ST NICHOLAS GIRLS' SCHOOL

Primary 6
Preliminary Examination

SCIENCE

BOOKLET B

26 August 2021

Booklet A	/56
Booklet B	/44
Total	/100

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

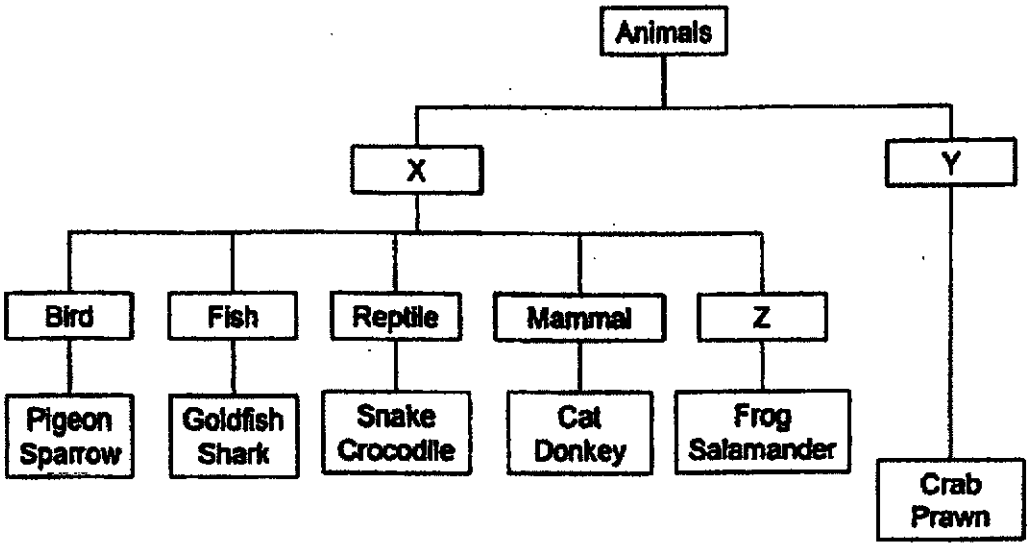
13 questions
44 marks

Do not open this booklet until you are told to do so.
Follow all instructions carefully.
Answer all questions.

This paper consists of 14 printed pages.

Section B (44 marks)
For questions 29 to 41, write your answers in this booklet.
The number of marks available is shown in the brackets at the end of each question or part question.

29. The chart below shows how some animals are classified.



(a) All the animals in Group Y have a common feature in their body structure which group X does not have. What is this common feature? [1]

_____

_____

(b) What does Group Z represent? [1]

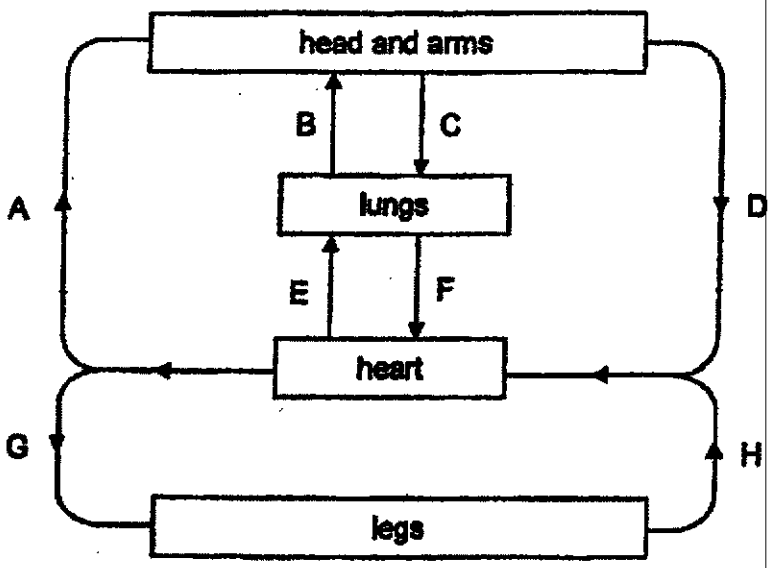
_____

(c) Sally said that whales should be grouped under fish. Do you agree with her? Explain your answer. [1]

_____

_____

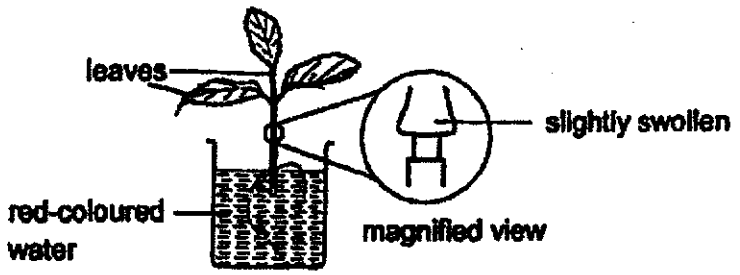
30. The diagram below shows the blood flow in some parts of the human body.



(a) Which two arrows are drawn incorrectly? [1]

(b) Blood at E contains a greater amount of gas X than at F. What is gas X? Give a reason for your answer. [1]

31. The diagram below shows a plant placed in a beaker of red-coloured water. The outer ring of a section of the stem of the plant was removed. The plant is left in the sun for a day.



(a) What would happen to the colour of the leaves after a day? Give a reason for your answer. [2]

_____

_____

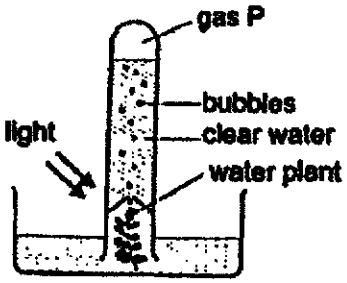
_____

(b) The upper part of the stem swelled slightly after a day. Explain why. [1]

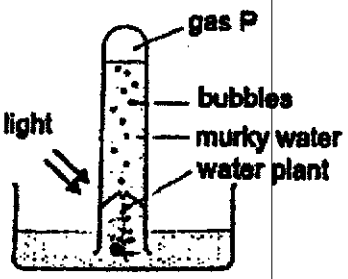
_____

_____

32. Mrs Ling conducted an experiment using the two set-ups shown below.



set-up A



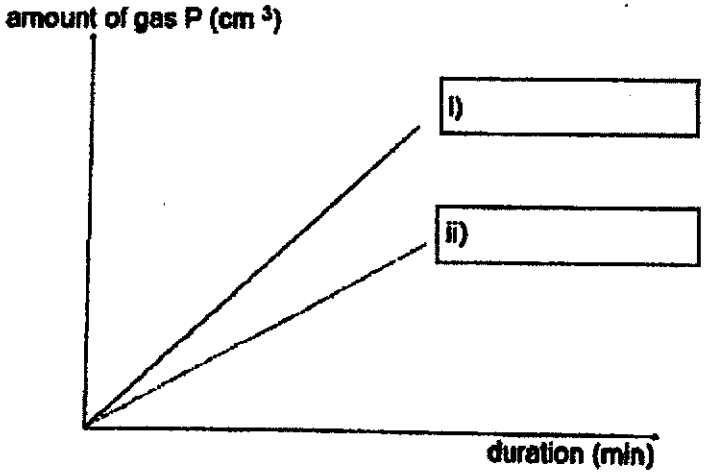
set-up B

She measured the amount of gas P collected at the top of the inverted test tube over a period of one hour.

(a) What is gas P? [1]

(b) Based on the given information, what is the aim of Mrs Ling's experiment? [1]

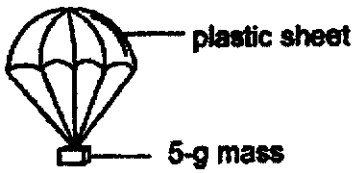
The graph below shows the results Mrs Ling obtained.



(c) On the same graph above, label set-up A and set-up B in the respective boxes. [1]

(d) Based on the results of the experiment, explain why it is advisable to use water in set-up A for keeping fish and plant in a tank. [1]

33. Aileen dropped a 5-g mass from a height of 2 m and recorded the time taken for it to reach the ground. She then made a toy by attaching a plastic sheet to the same 5-g mass. She wanted to find out how the size of the plastic sheet affects the time taken by the 5-g mass to reach the ground when dropped from a height of 2 m.



The experiment was repeated with plastic sheets of different sizes and the results were recorded in the table below.

Size of plastic sheet (cm^2)	Time taken for the 5-g mass to reach the ground (units)
without plastic sheet	1
100	3
200	6
300	8

(a) Based on the results, what can be concluded from the experiment? [1]

_____

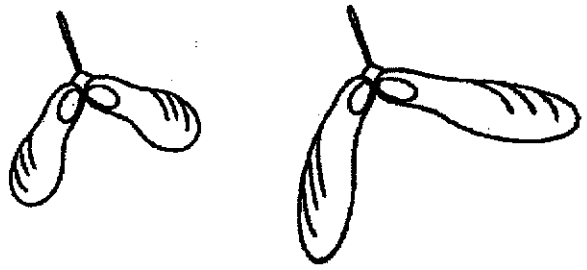
_____

(b) What was the purpose of dropping the 5-g mass without the plastic sheet? [1]

_____

_____

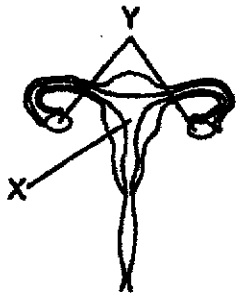
(c) Fruits G and H have the same mass of seeds but different sizes of the wing-like structures.



fruit G fruit H

Based on Aileen's experiment, which fruit G or H would be dispersed further away from the parent plant when dropped from the same height? Explain your answer. [2]

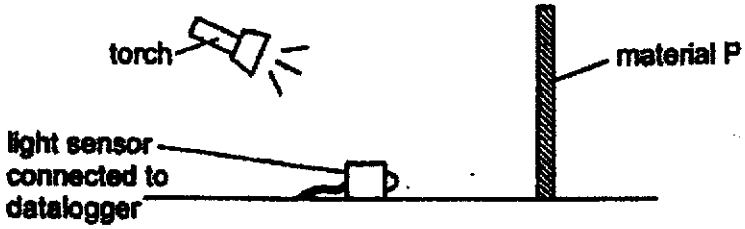
34. The diagram below shows the female reproductive system of a human.



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

(b) If one of part Y is removed, would the female still be able to reproduce? Give a reason for your answer. [1]

35. The set-up below was placed in a dark room to investigate which material was best for reflecting light. The experiment was first conducted using material P and repeated with materials Q and R.



The results were recorded in the table below.

Material	Amount of light detected (units)
P	280
Q	100
R	420

(a) Based on the above results, arrange the materials P, Q and R according to their transparency. [1]

_____ , _____ , _____

(allows most light to pass through) (allows least light to pass through)

(b) Which material should be used to make a safety vest for cyclists to wear at night? Give a reason for your answer. [2]

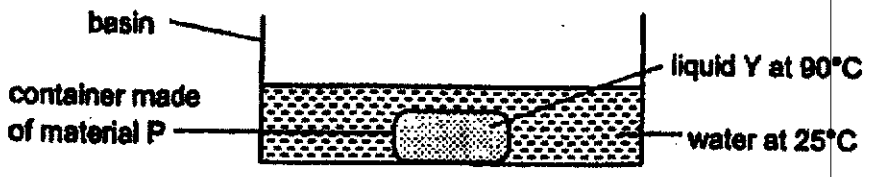
_____

_____

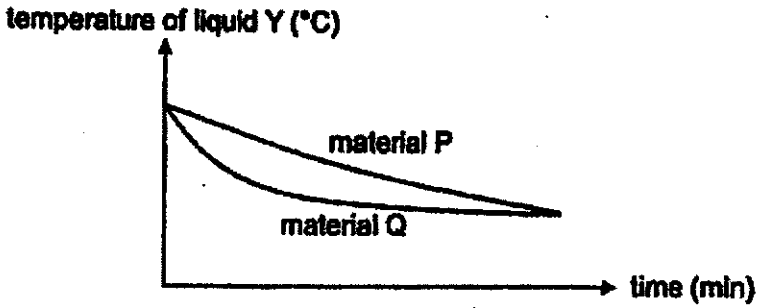
_____

_____

36. Arif conducted an experiment using the set-up below.



He measured the temperature of liquid Y in the container over a period of time. The experiment was repeated with another container made of material Q and the results are shown in the graph below.



Arif wanted to bring hot food and cold drinks for a picnic. He wanted to keep the food hot and the drinks cold.

(a) Which material(s) would be more suitable to be used to make such containers? [1]

i) Material for container carrying hot food: _____

ii) Material for container carrying cold drinks: _____

(b) Explain your choice for (ai) [2]

_____

_____

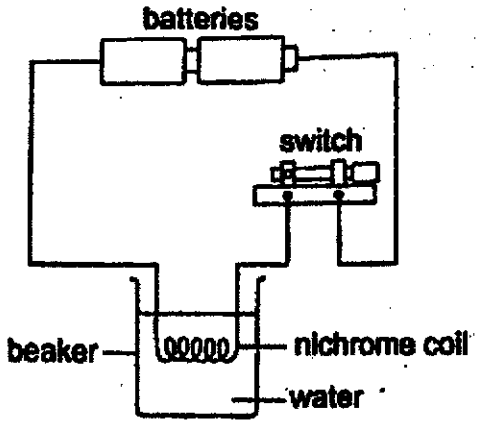
_____

(c) Why should the size of the containers made of P and Q be kept constant? [1]

_____

_____

37. The set-up below shows a nichrome coil converting electrical energy to heat energy to heat up water.



(a) What property of the nichrome coil allows the water in the beaker to heat up? [1]

_____

(b) Suggest one change to the set-up so that the water in the beaker will boil faster. Explain your answer. [2]

Change: _____

Explain: _____

_____

_____

_____

_____

38. The diagram below shows a wind turbine built at the centre of an expressway. The moving cars will cause the air around the turbine to move, which in turn causes the turbine to rotate. As the turbine rotates, there is electricity generated and is used to power the lights along the expressway at night.

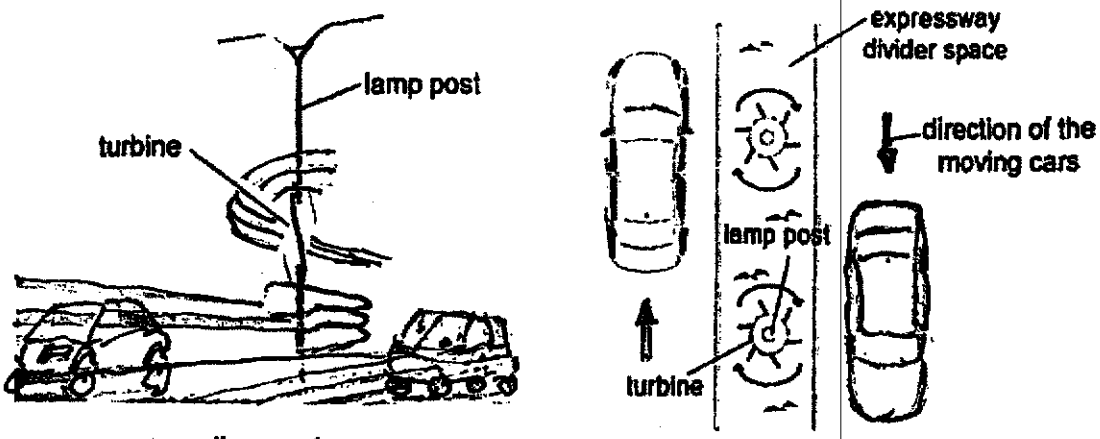


diagram 1

(a) What is the source of energy that turns the turbine in diagram 1? [1]

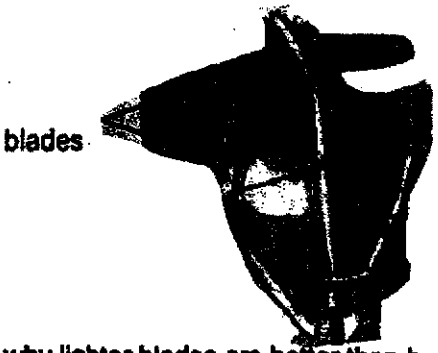
_____

(b) State one advantage of obtaining electricity from such a method. [1]

_____

_____

The diagram below shows the design of the blades of the turbine. They are normally slim and light.



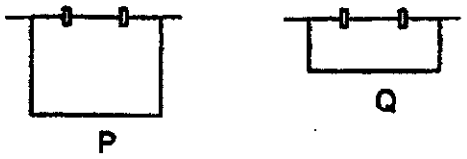
(c) Give a reason why lighter blades are better than heavier blades? [1]

_____

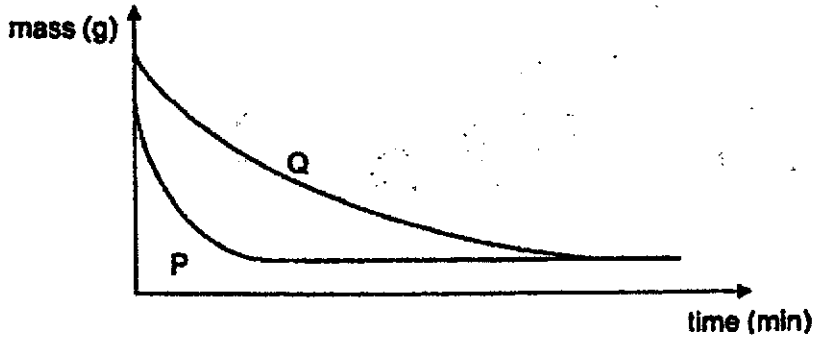
_____

_____

39. Zac sprayed two similar pieces of cloth P and Q with some water and recorded their masses. He folded cloth Q and hung both P and Q in the garden as shown in the diagram below.



The mass of cloth P and Q were recorded at regular intervals as shown in the graph below.



(a) Explain why the mass of cloth P and Q decreased as time passes. [1]

_____

_____

(b) Based on the graph, did Zac conduct a fair test? Explain your answer. [2]

_____

_____

_____

(c) From the graph, how can you tell when both pieces of the cloth are completely dry? [1]

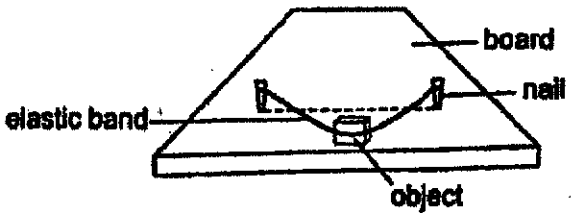
_____

_____

(d) State one other factor that affects the time taken for the cloths to dry. [1]

_____

40. Elaine set up an experiment as shown below. She pulls the object against the elastic band and released the object. The object moved across the board.



(a) What are the force(s) acting on the object after Elaine released it? [1]

Elaine repeated her experiment using objects of different sizes. These objects are of the same mass and material. She recorded her results as shown below.

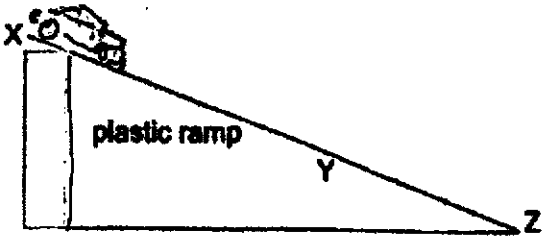
Object	Area of object in contact with the board (cm^2)	Distance moved by the object (cm)
X	30	15
Y	50	15
Z	60	15

(b) Based on the results, did the area of the object in contact with the board affect the distance travelled by the object? Explain your answer. [1]

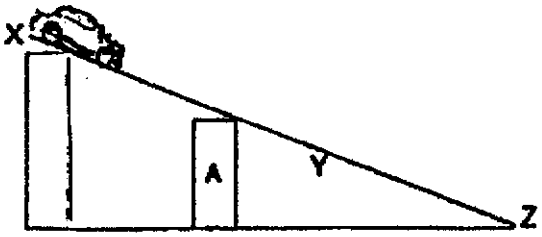
(c) Other than pulling the elastic band further, what can Elaine do to the set-up so that the object can move a further distance? Explain your answer. [2]

41. Refer to set-up 1 below. A toy car, made of steel, was released from X of a plastic ramp. The time taken for it to move from X to Y and then from Y to Z was taken.

The same experiment was then repeated with object A placed under the ramp as shown in set-up 2.



Set-up 1



Set-up 2

The table below shows the results from the 2 set-ups.

	Time taken (units)	
	X to Y	Y to Z
Set-up 1	15	8
Set-up 2	10	12

(a) Based on the information above, what is object A likely to be? [1]

_____

(b) Give a reason for the difference in time taken for the toy car to travel from X to Y in the two experiments. [1]

_____

_____

(c) The ramp in set-up 2 was replaced with an iron ramp. Will the time taken for the toy car to move from X to Y be longer, shorter or the same as compared to the results given for set-up 2 in the table?
Explain your answer. [2]

_____

_____

_____

_____

~ End of paper ~

ANSWER KEY

YEAR : 2021
LEVEL : PRIMARY 6
SCHOOL : CHIJ
SUBJECT : SCIENCE
TERM : PRELIMINARY

BOOKLET A

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

BOOKLET B

Q29	a) A hard outer covering b) Amphibians c) No, Whale are not fish as they do not have gills and are mammals.
Q30	a) C and B b) Carbon dioxide. Blood from E contains more carbon dioxide produced by the body and is transported to the lungs for gaseous exchange.
Q31	a) The leaves will turn red. The red-coloured water is absorbed through the steam and transported through the water-carrying tubes to the leaves, turning it red. b) The food made by the leaves were not able to be transferred down to the roots as the phloem has been cut off.
Q32	a) Oxygen b) To find out if clear or murky water is better for plants to photosynthesise. c) i) Set-up A ii) Set-up B d) Set-up A has more oxygen produced. Fish need oxygen to respire. Thus using the water in set-up it will allow the plant in the tank to carry out more photosynthesis and more oxygen is produced for the fish to respire.
Q33	a) The bigger the size out the plastic sheet the longer the time take for the 5-g mass to reach the ground.

	b) It is a control set-up to compare and confirm that on Y difference in the time taken for the toy to reach the ground is only due to the size of the plastic sheet. c) Seed H. It has a larger surface area and will take a longer time to reach the ground. So it will be able to stay in the air for a longer time for the wind to carry it further away from the parent plant.
Q34	a) X is the part where the fertilised egg develops. b) Yes. There would still be one more ovary to release eggs.
Q35	a) Q , P , R b) R.R affects the most light from the cars, head light into the drivers eyes so the drivers can see the cyclist to keep them safe.
Q36	a) i. P ii. P b) The temperature of liquid Y in material P decreased slower, so P is a poorer conductor of heat and will allow the hot food to lose heat to the surrounding. c) The size of the containers P and Q have to keep constant so that the exposed surface area in contact with the water will be the same.
Q37	a) The nichrome coil is a conductor of electricity. b) Change : Add more batteries Explain : The would be more chemical potential energy converted to electrical energy to more heat energy so the water in the beaker can boil faster.
Q38	a) Wind energy b) It does not pollute the environment c) The wind will be able to turn the lighter blade faster and thus more electricity can be generated.
Q39	a) Water in the cloth gained heat from the surrounding and evaporated. b) No. It is not a fair test. The starting mass of cloth is different so it shows that different amounts of water are added to each cloth so there was more than one variable change in the experiment. c) The mass of the cloth stopped decreasing as it became a lighter mass. d) The temperature of the surroundings.
Q40	a) Frictional force and Gravitational force b) It does not. When the area of the block in contact with the board change, the distance moved by the object is same, showing that the frictional force between the block and board is the same. c) Put lubricant oil on the board. This will reduce the frictional force between the block and board and allow the block to move faster.
Q41	a) A magnet b) The magnet in set-up 2 attracted the toy car causing it to move at a faster speed from point X to Y. There is a magnet in set-up 1, the car will move down the ramp

	c) **The time taken will be longer as the magnet force will not be able to pass through the iron ramp, thus object A will not attract the toy car to move it more faster.**

3

END