MARIS STELLA HIGH SCHOOL (PRIMARY)

CA1 EXAMINATION

SCIENCE

3 MARCH 2022

BOOKLET A

NAME: _____ ( )

CLASS: Primary 6 _____

28 questions

56 marks

Total Time for Booklets A & B: 1 h 45 min

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

FOLLOW ALL INSTRUCTIONS CAREFULLY.

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 (OAS).

(28 x 2 marks)

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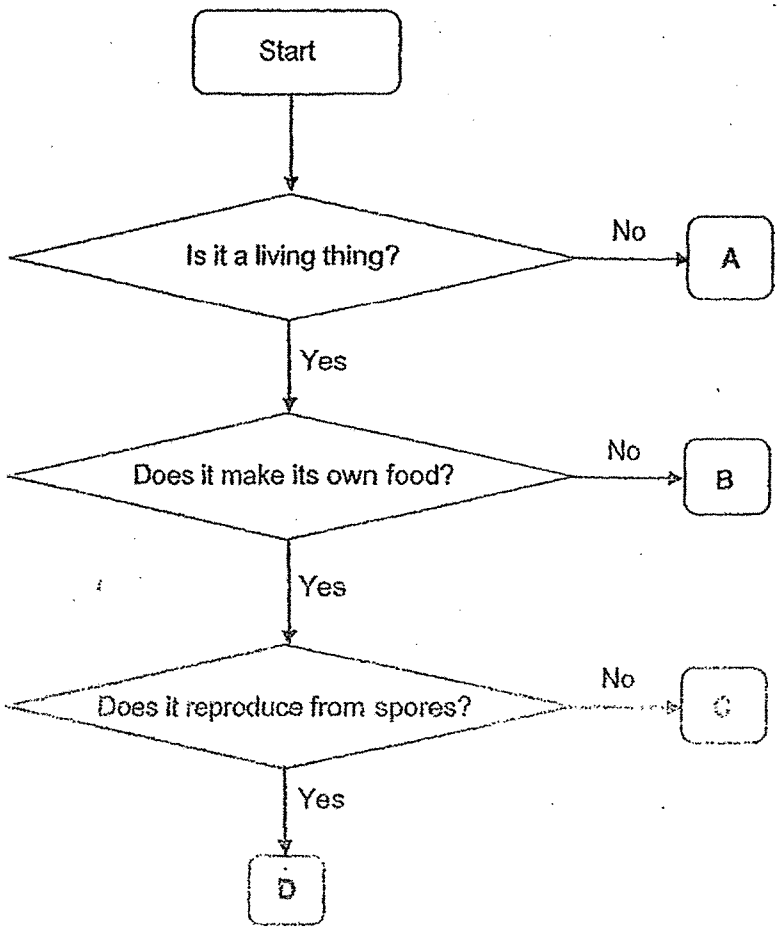
1 Study the chart below.



Based on the chart above, which of the following correctly represents a fern?

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

(Go on to the next page)

2 Audrey made the following observations on organism X.

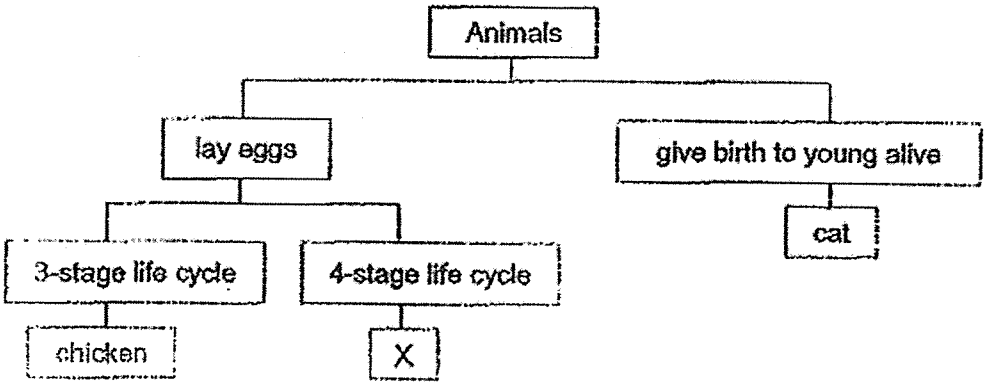
- X fed on leaves.
- X moved away from bright light.
- X increased in numbers after 10 days.

Which of the following characteristics of living things can be inferred from the observations?

A Living things grow.
B Living things respond.
C Living things reproduces.

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

3 Study the classification chart below.

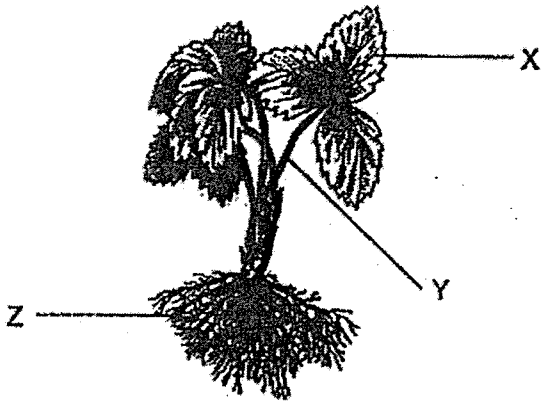


Which of the following animals can X be?

(1) frog
(2) beetle
(3) cockroach
(4) grasshopper

(Go on to the next page)

4 Study the plant below.



In which part(s) can water-carrying tubes be found?

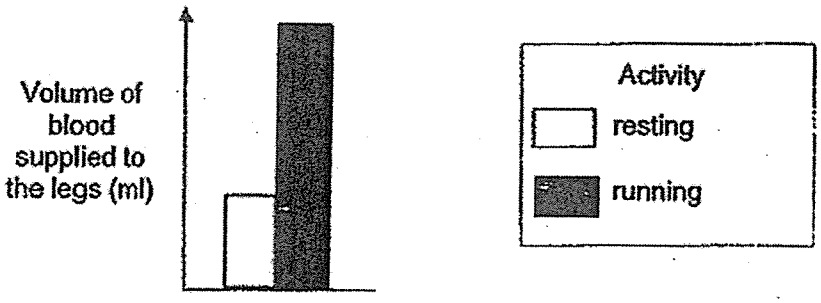
(1) Y only
(2) Z only
(3) Y and Z only
(4) X, Y and Z

5 Which of the following shows the correct order in which food moves through the various body parts to the legs?

(1) large intestine, blood vessels, heart, legs
(2) large intestine, heart, blood vessels, legs
(3) stomach, small intestine, blood vessels, legs
(4) small intestine, large intestine, blood vessels, legs

(Go on to the next page)

6 The diagram below shows the volume of blood supplied to the legs during two activities.



Which of the following statements about the two activities is correct?

(1) The legs do not need blood during rest.

(2) The body produces more blood when running.

(3) More digested food and oxygen are transported to the legs when running.

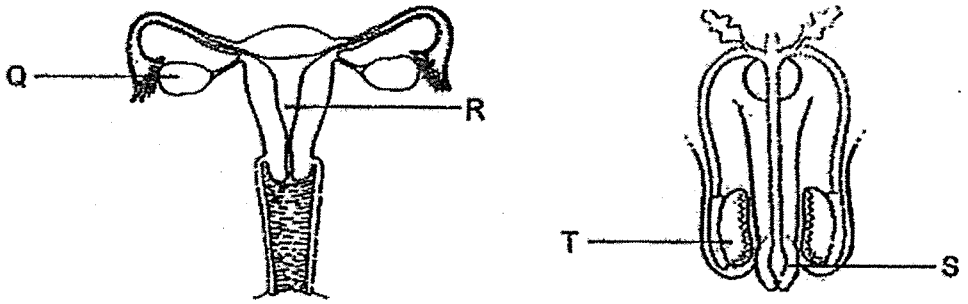
(4) More blood is supplied to the legs during running to produce more oxygen and digested food.

7 Which of the following statements about plant and human transport systems is correct?

	Plant	Human
(1)	Water and food are transported in the same tubes.	Water and food are transported in the same tubes.
(2)	Water and food are transported in different tubes.	Water and food are transported in different tubes.
(3)	Water and food are transported in the same tubes.	Water and food are transported in different tubes.
(4)	Water and food are transported in different tubes.	Water and food are transported in the same tubes.

(Go on to the next page)

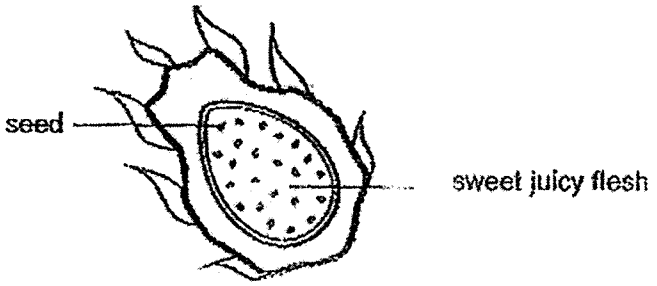
8 The diagram below shows the human reproductive systems.



Which of the following about the human reproductive systems is true?

(1) S produces sperms.
(2) T stores unfertilised eggs.
(3) Q produces fertilised eggs.
(4) The fertilised egg develops in R.

9 The fruit below developed from flower P.



Which of the following statements about the fruit is most likely correct?

(1) The seeds are dispersed by wind.
(2) The ovules of flower P were not fertilised.
(3) The sweet juicy flesh fruit attracts pollinators.
(4) There were many ovules in the ovary of flower P.

(Go on to the next page)

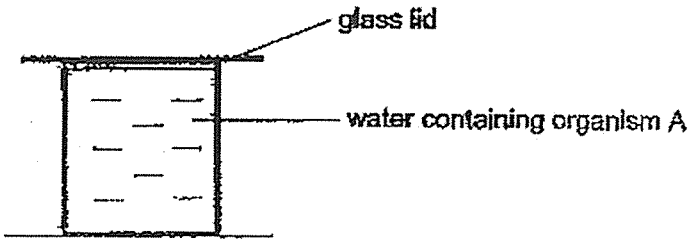
10 Study the transfer of energy between the organisms below.

plant → rabbit → snake → owl

Which one of the following is true?

(1) Rabbit gets its energy from the snake.
(2) The sun is the direct source of energy for the owl.
(3) The plant is the indirect source of energy for the rabbit.
(4) All animals depend on the plant directly or indirectly for energy.

11 Dylan placed organism A into a container of water as shown in the diagram below.



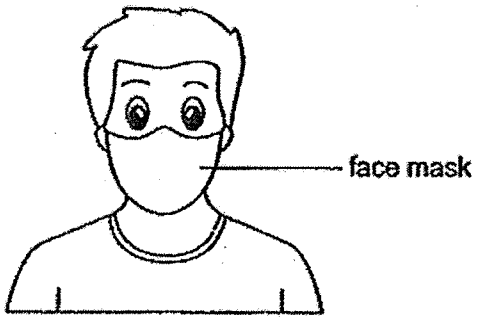
He placed the container under bright light and measured the amount of oxygen in the container over 6 hours.

Which of the following is possibly correct?

	Organism A	Amount of oxygen in the container after 6 hours
(1)	fish	increase
(2)	fish	remains the same
(3)	water plant	increase
(4)	water plant	decrease

(Go on to the next page)

12 A face mask protects and prevents harmful viruses in the air from entering our respiratory system while still allowing us to breathe.



Based on the description above, which cell part has similar function as a face mask?

(1) nucleus
(2) cytoplasm
(3) chloroplast
(4) cell membrane

13 The picture below shows a pair of boots used by fishmongers.

Which of the following properties of materials of the boots helps prevent the user's feet from getting wet?

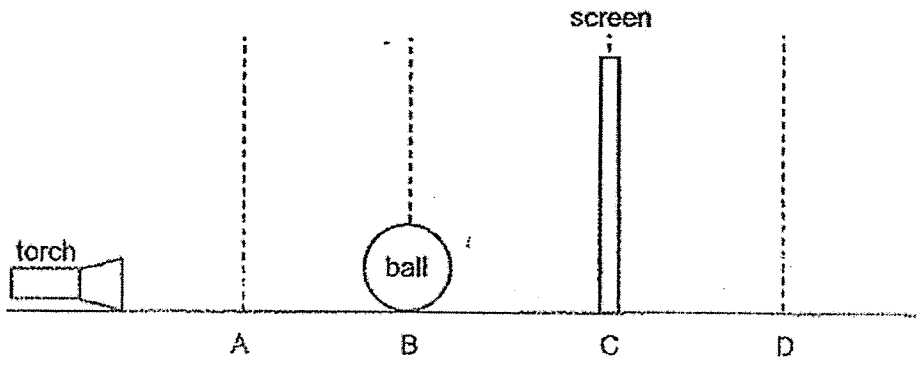
(1) strength
(2) flexibility
(3) waterproof
(4) ability to float

(Go on to the next page)

14 Which of the following shows the properties of a liquid?

	shape	volume
(1)	fixed	fixed
(2)	fixed	not fixed
(3)	not fixed	fixed
(4)	not fixed	not fixed

15 A torch, a ball and a screen were placed as shown below to cast a shadow on the screen.

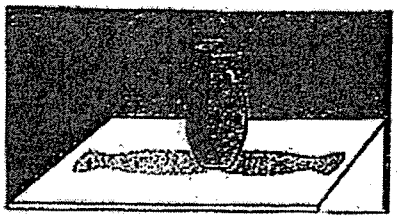


Which of the following shows the position of the ball and the screen such that the biggest shadow will be cast on the screen?

	Position of ball	Position of screen
(1)	A	C
(2)	A	D
(3)	B	C
(4)	B	D

(Go on to the next page)

16 The picture below shows a vase forming two shadows on the surface of a table.

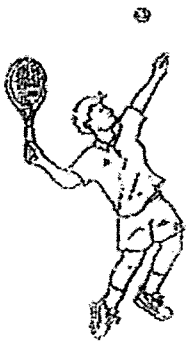


Which of the following explain(s) how the two shadows are formed?

A The vase reflects light.
B Two light sources are shining at the vase.
C The vase is made of a material that blocks light.

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

17 Ahmad is playing tennis with his friend. When the tennis ball comes towards him, he hits it with his racket as shown below.



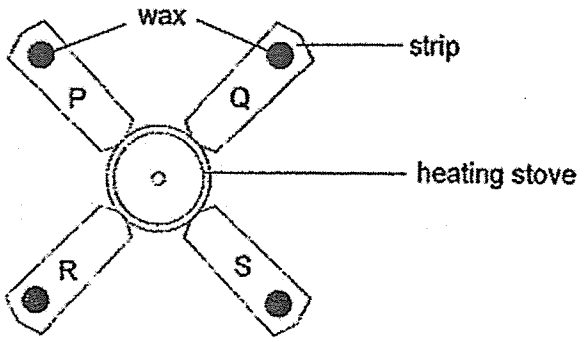
Which of the following will change after Ahmad hits the tennis ball with his racket?

A Mass of the tennis ball
B Speed of the tennis ball
C Direction of the tennis ball

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

(Go on to the next page)

18 Edward attached strips P, Q, R and S to a heating stove. P, Q, R and S are made of different materials. He attached a piece of wax at the end of each strip as shown in the diagram below.

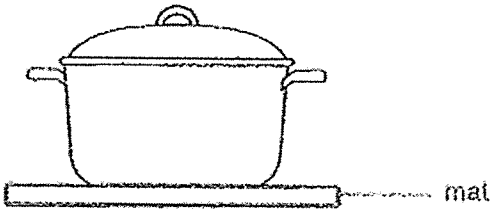


He observed that the wax melted in the following order:

S, R, Q, P

First ⟶ Last

He wants to use one of the above materials to make mats to place hot pots on so that the hot pots do not burn the table.



Which material is most suitable for making mats for the purpose above?

(1) P

(2) Q

(3) R

(4) S

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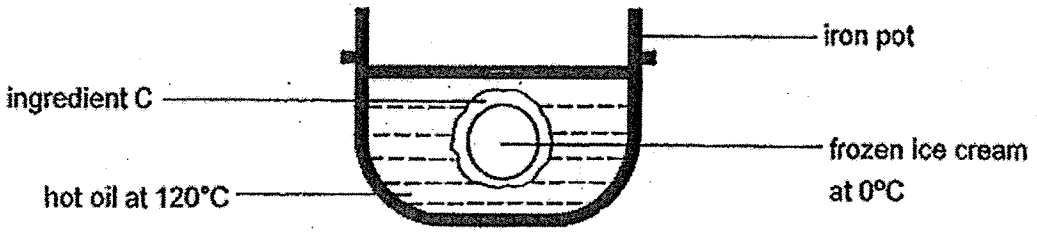
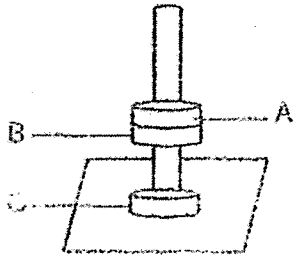
19 Fried ice cream is made by coating a layer of ingredient C around frozen ice cream before frying it in very hot oil for a short time. The diagram below shows the cross section of a ball of fried ice cream.



Which of the following best explains why the ice cream remains frozen when fried at high temperatures?

(1) Ingredient C gained heat from the hot oil.
(2) The oil was not hot enough to melt the ice cream.
(3) The melting point of the ice cream is higher than the hot oil.
(4) Ingredient C conducted heat slowly from the hot oil to the ice cream.

20 Study the set-up below.

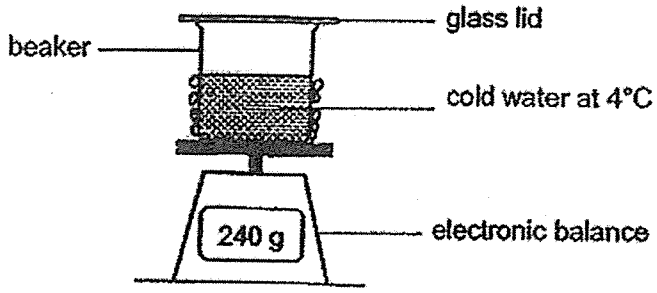


Which of the following correctly identifies A, B and C?

	A	B	C
(1)	magnet	non-magnetic material	magnetic material
(2)	non-magnetic material	magnet	magnet
(3)	magnet	non-magnetic material	magnet
(4)	magnetic material	magnet	non-magnetic material

(Go on to the next page)

21 Henry placed a beaker of cold water at 4°C on an electronic balance in a classroom. The reading on the electronic balance at the start of the experiment is shown below.



Which of the following shows the correct reading and explanation after 10 minutes?

	Electronic balance reading	Explanation
(1)	238 g	The water in the beaker evaporated.
(2)	238 g	The beaker lost heat and contracted.
(3)	240 g	Evaporation could not take place.
(4)	243 g	Condensation occurred on the outer surface of the beaker.

22 The table below shows the melting and boiling point of 3 substances, X, Y and Z.

Substance	Melting point (°C)	Boiling point (°C)
X	1	99
Y	28	66
Z	59	210

At which temperature are all three substances in the solid state?

(1) 0°C
(2) 46°C
(3) 59°C
(4) 240°C

(Go on to the next page)

23 The diagrams below show an aeroplane during three different stages of its flight.

flying

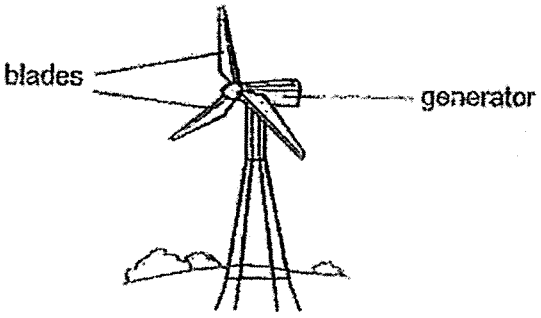
taking off

landing

At which stage(s) does gravitational force act on the aeroplane?

(1) landing only
(2) flying only
(3) taking off and landing only
(4) taking off, flying and landing

24 A wind turbine generates electricity from wind as shown in the diagram below.



Which of the following is the source of energy for the wind turbine?

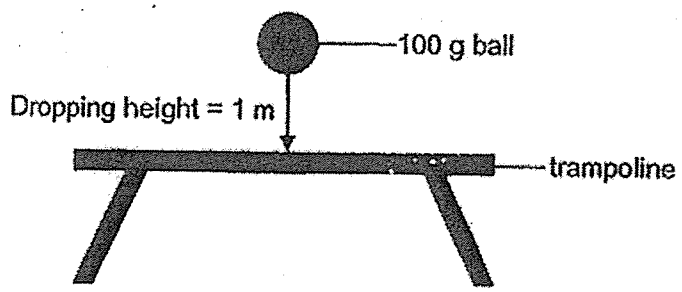
(1) sun
(2) generator
(3) moving air
(4) blades of the turbine

(Go on to the next page)

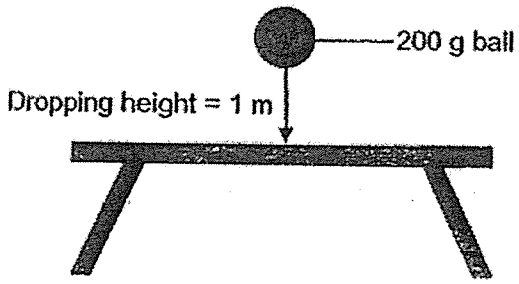
25 Jeremy dropped four balls of different mass at different heights, one at a time, onto the centre of a trampoline as shown below. He measured the highest height each ball bounced up to.

In which of the following set-ups would Jeremy measure the highest height the ball bounced up to?

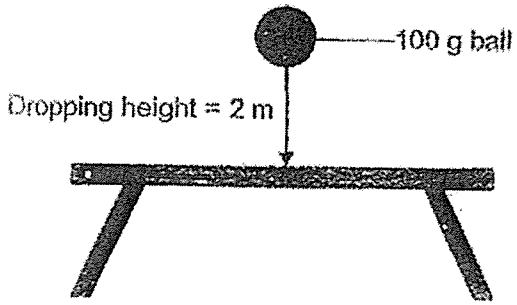
(1)



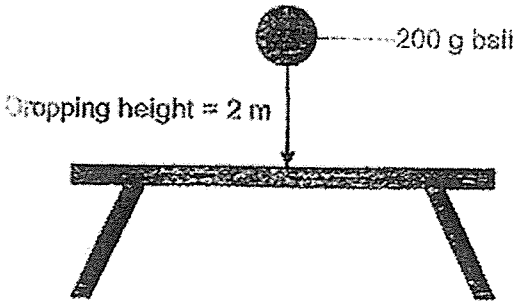
(2)



(3)



(4)



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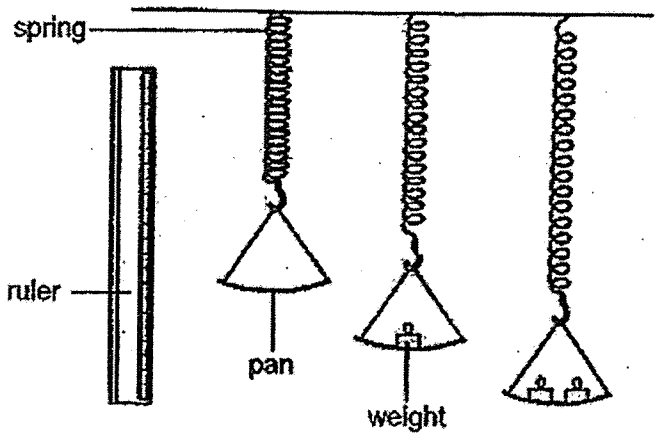
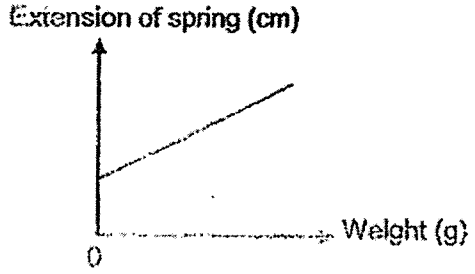
26 John carried out an experiment using the set-up below. He measured the length of the spring when there was no weight on the pan. He continued to measure the length of the spring every time he added a weight on the pan.



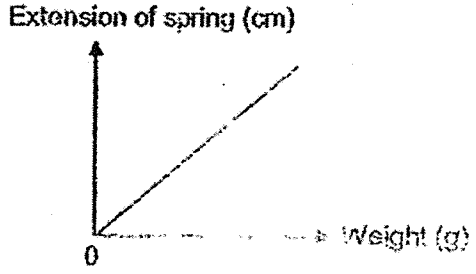
Based on the results above, John drew a graph to show the relationship between the extension of the spring and the weights used.

Which one of the following graphs is correct?

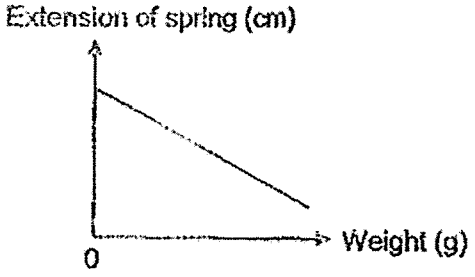
(1)



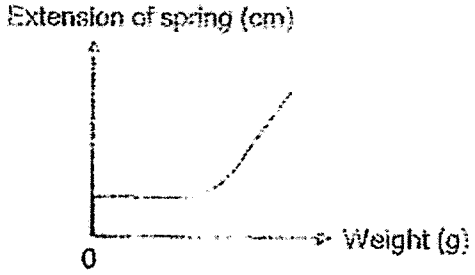
(2)



(3)



(4)



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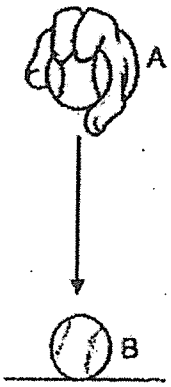
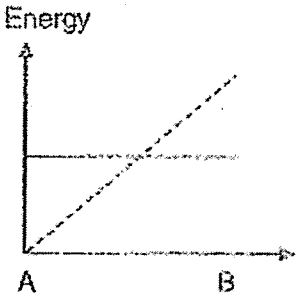
27 Don dropped a ball onto the ground as shown.



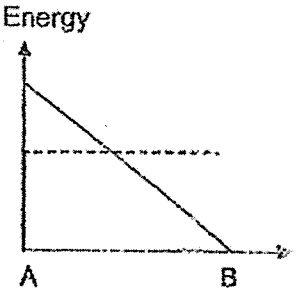
Which one of the following graphs correctly shows the energy conversion that occurred from A to B?

Key:
----- potential energy
—— kinetic energy

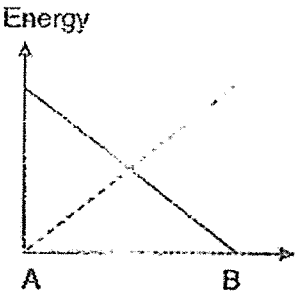
(1)



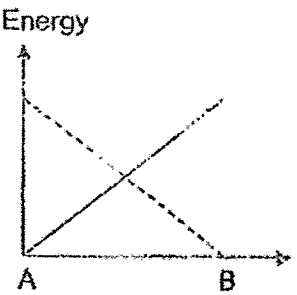
(2)



(3)



(4)



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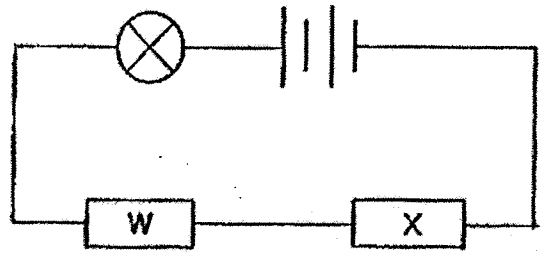
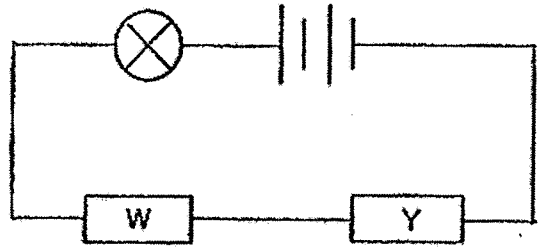
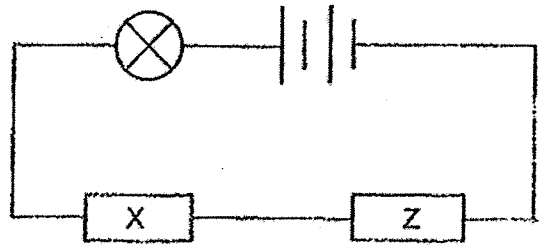
28 Study the circuits below. W, X, Y and Z represent different materials.



Bulb did not light up.



Bulb lit up.



Bulb did not light up.

Which material is definitely a non-conductor of electricity?

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

END OF BOOKLET A

MARIS STELLA HIGH SCHOOL (PRIMARY)

CA1 EXAMINATION

SCIENCE

3 MARCH 2022

BOOKLET B

NAME: _____ ( )

CLASS: Primary 6 _____

13 questions

44 marks

Total Time for Booklets A & B: 1 h 45 min

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

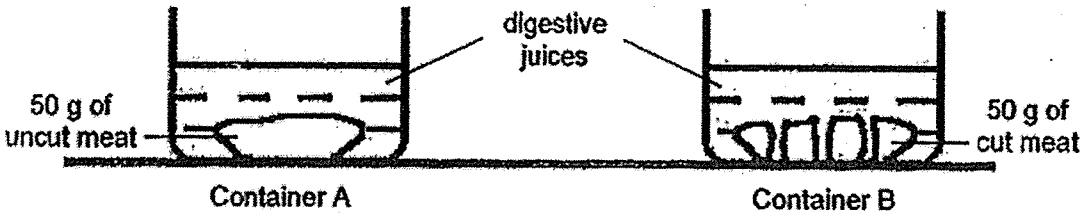
FOLLOW ALL INSTRUCTIONS CAREFULLY.

Booklet A:	_____ / 56
Booklet B:	_____ / 44
Grand Total:	_____ / 100

Parent's Signature: _____

For questions 29 to 41, 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 Harry placed equal amounts of meat in two containers, A and B. He placed an uncut piece of meat in A and cut pieces of meat in B. He then filled both containers with the same amount of digestive juices.



(a) In which container, A or B, would the meat be digested faster? Explain your answer. [1]

(b) Name 3 parts of the human digestive system that produce digestive juices. [1]

(c) Name 2 human systems that work closely with the human digestive system to carry out life processes. [1]

3

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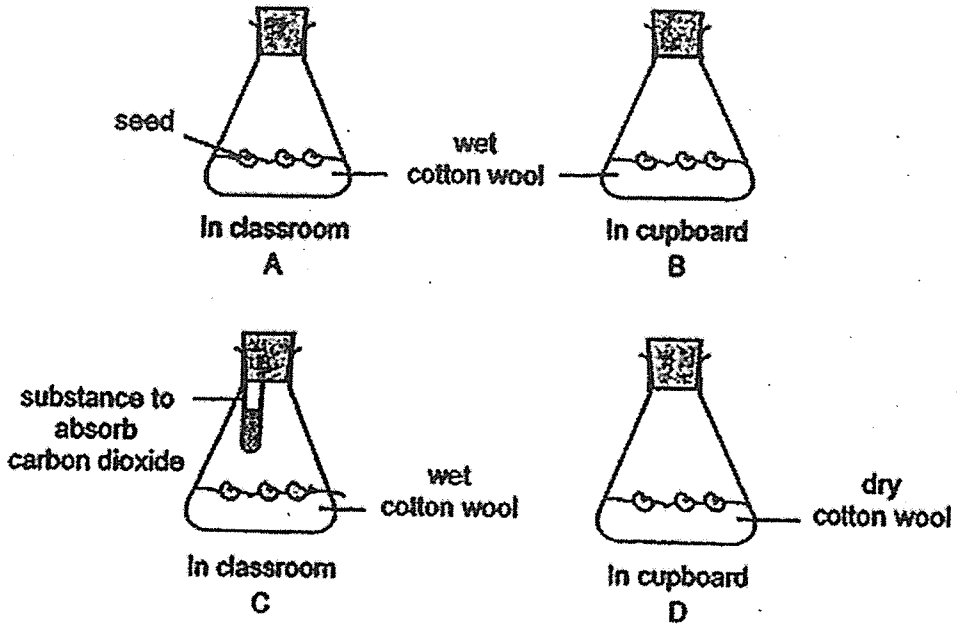
30 Jenny prepared set-ups A, B, C and D as shown below.



(a) In which of the set-ups, A, B, C and D, will the seeds germinate? [1]

(b) Jenny wants to investigate if carbon dioxide is needed for the germination of seeds. Which two set-ups, A, B, C and D, should she use? [1]

(c) Besides repeating the experiment, what can Jenny do to obtain more reliable results? [1]

3

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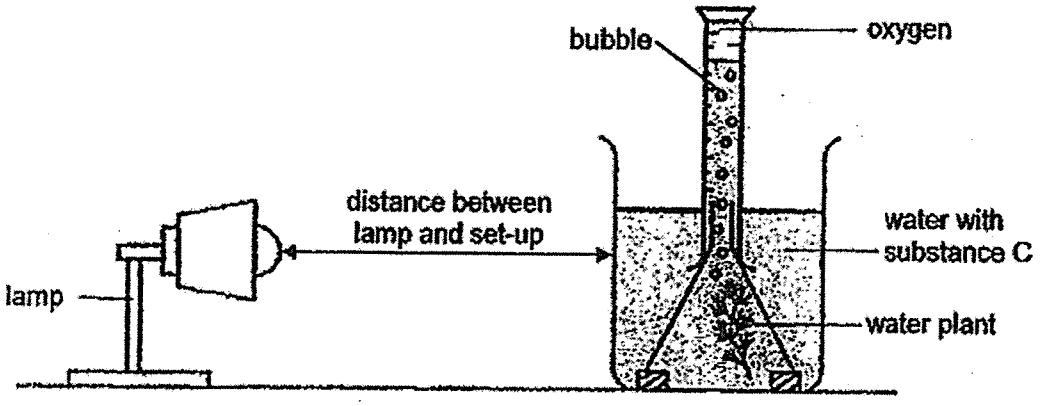
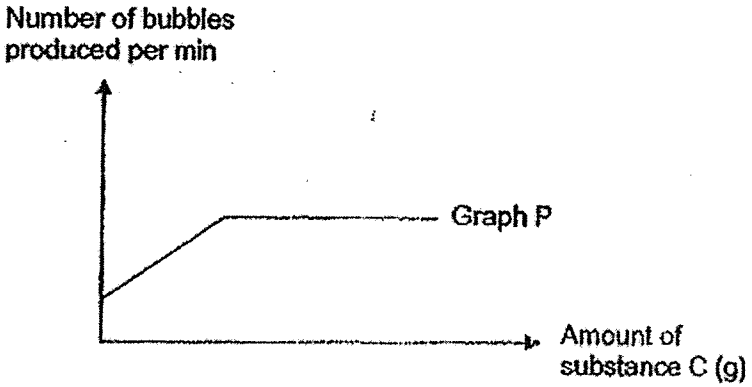
31 Leon carried out an experiment to investigate how the amount of carbon dioxide affects the rate of photosynthesis. Substance C releases carbon dioxide when dissolved in water.



Leon recorded the number of bubbles produced by the water plant per minute and recorded his results in the graph below.



(a) State how the amount of carbon dioxide affects the rate of photosynthesis. [2]

_____

_____

_____

_____

2

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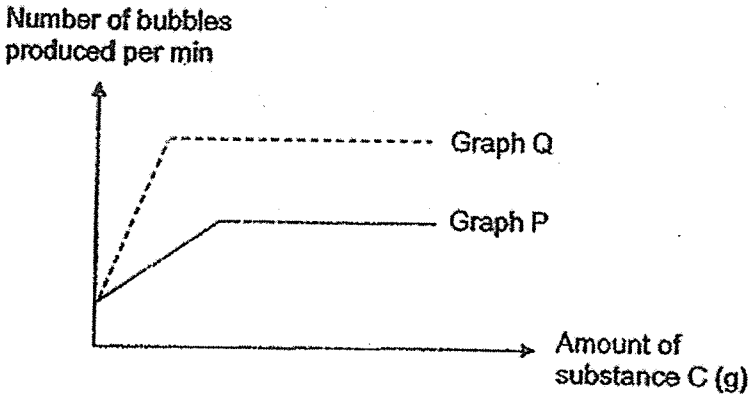
Leon repeated his experiment by changing one variable in his set-up. He did not add or remove anything to his set-up. He obtained another set of results as shown in Graph Q below.



(b) What change did Leon make to his set-up to obtain the results shown in Graph Q? [1]

	1

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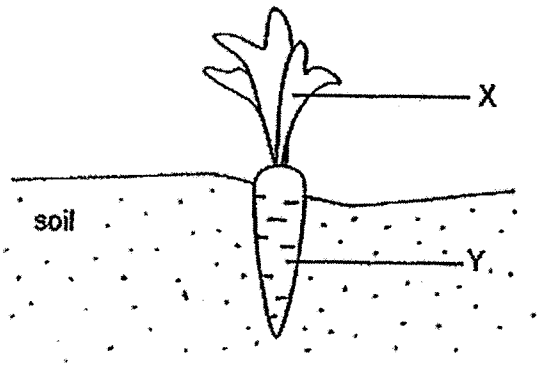
32 Sean observed the cells in parts X and Y of a carrot plant under a microscope.



(a) State the function of part X. [1]

(b) State a difference in the cell parts found in the cells taken from X and Y. [1]

(c) Sean placed the cells of part X in a dish of water.

Explain why the shape of the cells did not change after being placed in water. [1]

3

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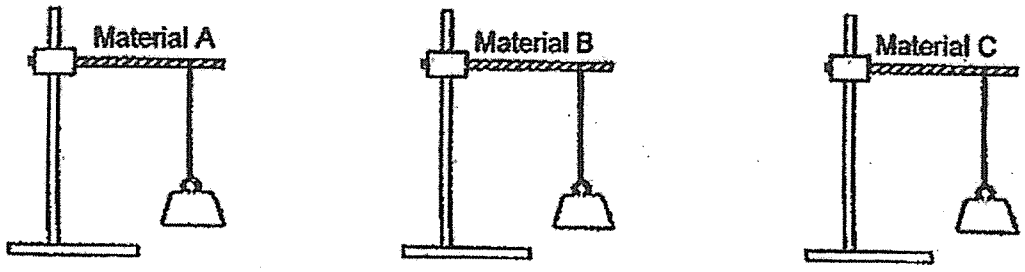
33 Jane conducted an experiment to find a suitable material for making a bookshelf. She hung weights on rods made of different materials, A, B and C, as shown in the diagram below.



Jane hung 10-kg weights to each material until it broke. She recorded the maximum number of weights the material could hold before breaking.

Material	Maximum number of 10-kg weights the material can hold
A	2
B	5
C	5

(a) Which property of material is Jane testing? [1]

(b) Based on the results, what can you conclude about materials A and B? [1]

(c) Based on the results, what can you conclude about materials B and C? [1]

(d) Jane is not able to conclude which material is most suitable to make the bookshelf.

What improvement can Jane make to the experiment to find out which material is most suitable to make the bookshelf? [1]

4

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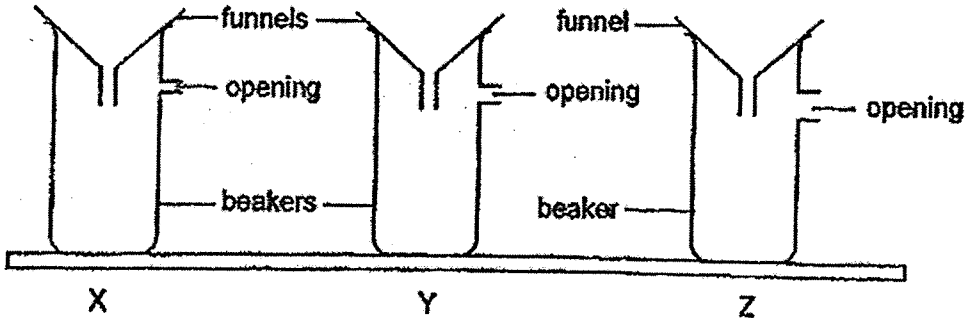
34 The diagram shows beakers, X, Y and Z, each with the same volume and shape. Each of the beakers has an opening of different size at its side. Identical funnels were placed over the mouths of each beaker.



100 ml of water was poured into the funnel and the time taken for all the water to flow into the beaker was measured. The results are as shown.

Beaker	Size of opening (mm)	Time taken for all the water to flow into the beaker (s)
X	4	35
Y	8	27
Z	12	11

(a) State how the size of opening at the side of each beaker affected the time taken for all the water to flow into the beaker. [1]

(b) Explain the result observed in beaker X. [2]

	3

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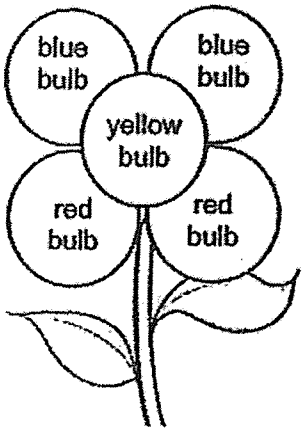
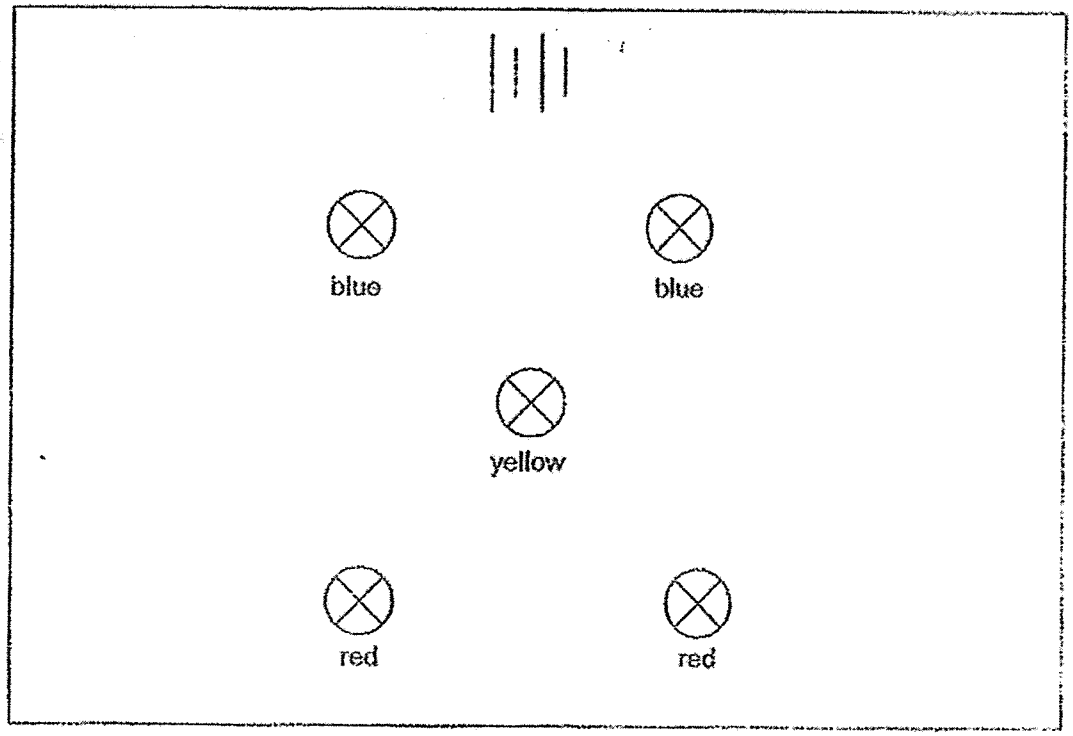
35 The picture below shows a light display of a flower. It is made up of 5 different coloured bulbs as shown.



Both the red bulbs can be lighted without lighting the blue bulbs. Both the blue bulbs can also be lighted without lighting the red bulbs. The yellow bulb is always lighted.

(a) Complete the circuit diagram below by adding wires and 2 switches to show how the bulbs are connected in the flower display. Use electrical symbols in your drawings. [2]



(b) Mark an "X" in the circuit drawn above to show where another switch can be placed to control the turning on and off of all the bulbs in the display. [1]

	3

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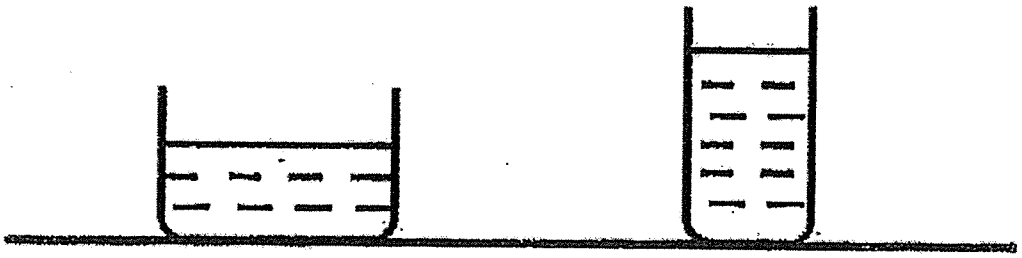
36 (a) State what evaporation means. [1]

Aloysius poured equal amounts of water into containers C and D as shown and placed them at the same location. He measured the volume of water left in each container after a week.



Container C Container D

(b) What is the aim of Aloysius' experiment? [1]

(c) Which container, C or D, will have less water left after one week? Explain your answer. [1]

(d) Name two factors that Aloysius was keeping constant when he placed both containers at the same location. [2]

5

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37 Gabriel wants to find out if the mass of an object affects the amount of potential energy it possesses. He dropped balls A and B from the same height above a tray of sand and measured the depth of depression made by the balls on the sand.

(a)(i) One of the ball is 50 g and another ball is 100 g.

Complete the table below by filling in the mass of balls of A and B. [1]

Ball	Mass of ball (g)	Depth of depression in sand (cm)
A		4.1
B		4.5

(ii) Explain your answer for ball A in terms of energy conversion. [1]

(b) Why is it important to keep the height of release of the balls the same? [1]

(c) State another important variable that must be kept the same for the result to be reliable. [1]

	4

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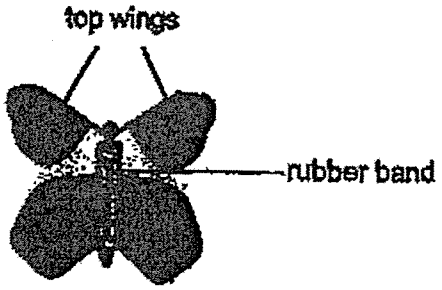
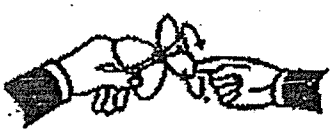
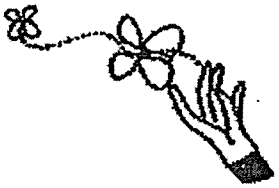
38 Study the toy shown below.

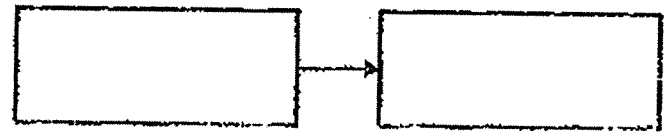


Carol twisted the rubber band in the toy by turning the top wings of the toy 10 times. When she released the toy, it stayed in the air for a while before dropping to the ground.





(a) Fill in the boxes to show the energy changes in the wound up toy when released. [1]



(b) Without changing any part of the toy, suggest a way to make the toy stay in the air for a longer time. [1]

(c) Explain your answer in (b). [2]

4

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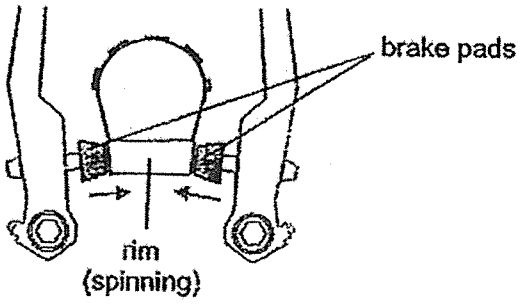
39 The diagram below shows Max cycling up and down a slope.

(a) Explain why Max needed to exert more force to go up than down the slope. [1]

To slow down, Max applies the brakes on his bicycle. When the brakes are applied, the brake pads press against the rim of the spinning bicycle wheel as shown in the diagram below.



(b) Explain, in terms of forces, how the brake pads help to slow the bicycle down. [1]

(c) Jia Yi suggested to Max that he can apply oil on the brake pads to help the bicycle slow down more quickly when the brakes are applied.

Do you agree with Jia Yi's suggestion? Explain your answer. [1]

	3

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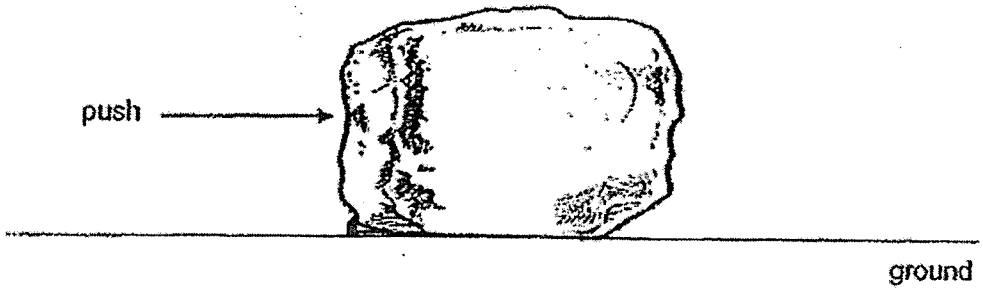
40 In the diagram below, draw **two** arrows to show the direction of two forces acting on the stone as it is being pushed in the direction indicated. Name the force next to each of the arrows drawn. [2]



	2

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41 Kumar placed a magnet on top of a balance as shown in Diagram 1.

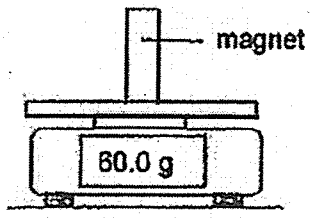


Diagram 1

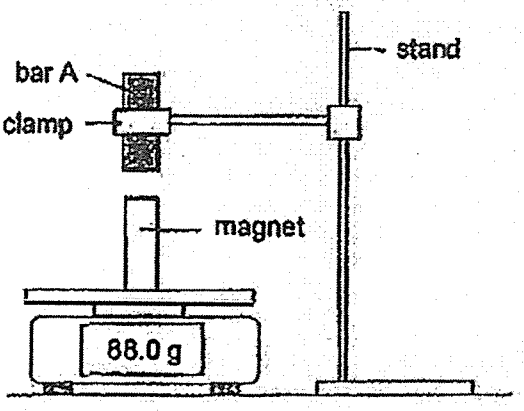


Diagram 2

He brought bar A close to the magnet as shown in Diagram 2.

(a) State what bar A is. [1]

(b) Explain why the reading of the balance increased in Diagram 2. [2]

(c) Kumar replaced bar A with an iron bar of the same size in the set-up in Diagram 2,

State which reading, P, Q, R, S or T, shown below is possible on the balance. [1]

P	Q	R	S	T
56.0g	60.0 g	64.0 g	68.0 g	72.0 g

Reading: _____

END OF PAPER

	4

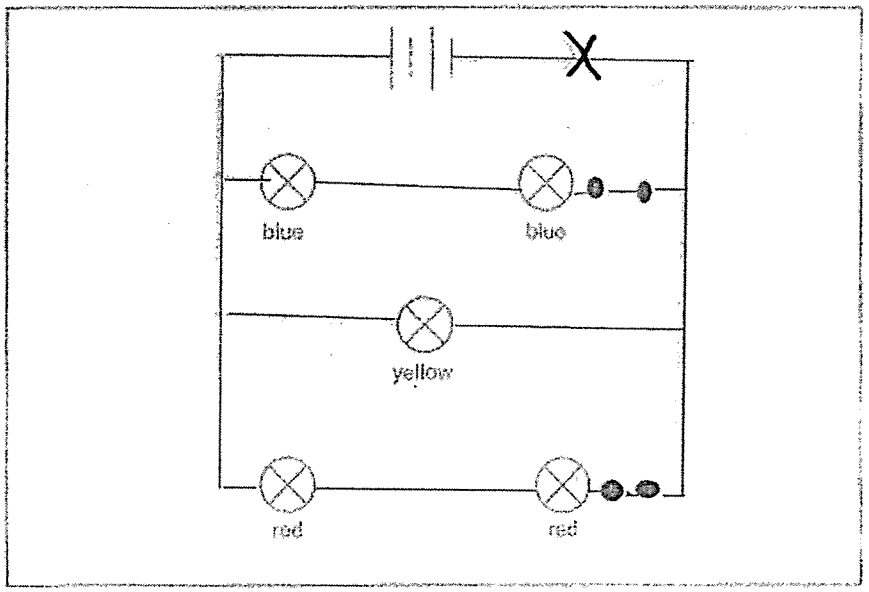
SCHOOL : MARIS STELLA PRIMARY SCHOOL
LEVEL : PRIMARY 6
SUBJECT : SCIENCE
TERM : 2022 CA1

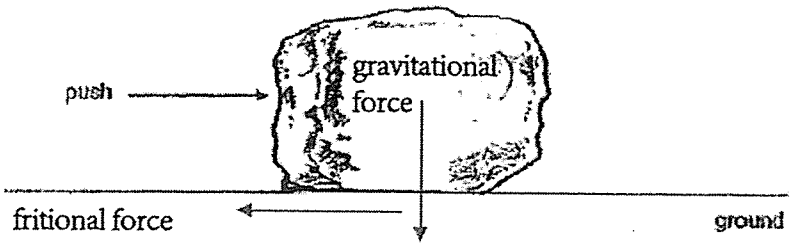
SECTION A

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

SECTION B

Q29)	(a) B. The meat in container B had a greater exposed surface area in contact with the digestive juices and digest faster. (b) Mouth, stomach, small intestine. (c) 1) Circulatory system. 2) Respiratory system.
Q30)	(a) A,B,C. (b) A and C. (c) Put more seeds in each set-up. (d)
Q31)	(a) The amount of carbon dioxide increases the rate of photosynthesis of the plant. However of the plant reaches its maximum rate of photosynthesis the amount of carbon dioxide does not affect the plant's rate of photosynthesis. (b) He moved the lamp closer to the set-up.

Q32)	(a) To trap light and make food during photosynthesis. (b) The cell parts M X have chloroplasts while the cell parts in Y do not. (c) The cell wall gave the cell a fixed shape.
Q33)	(a) The strength of the material. (b) Material B has greater strength than material A. (c) Material B and C have the same strength. (d) Change the 10-kg weights to 1-kg weights.
Q34)	(a) As size of opening increases, the time taken for all the water to flow in decreases. (b) The opening in beaker X was the smallest, hence, at in the beaker escaped the beaker slowest so water occupied the space preciously occupied by the air slowest.
Q35)	 a)b)
Q36)	(a) The process whereby a liquid changes to gas. (b) To find out how the exposed surface area of water in contact with the surroundings affect the rate of evaporation.

	(c) C. The water in C had a greater amount of exposed surface of water to the surroundings. Hence, the water will gain heat and evaporate faster. (d) 1)Temperature of surroundings. 2)Wind speed of surroundings.
Q37)	(a) i) A---50g B---100g ii) A with less mass has less potential energy converted less kinetic energy. (b) Height affects the amount of potential energy. (c) Force of release.
Q38)	(a) Potential energy → kinetic energy (b) Twist the rubber band more times. (c) By twisting the rubber band more there will be more potential energy in the twisted rubber band to be converted to more kinetic energy in the rubber band to be transferred to more kinetic energy in the released toy, allowing the toy to in the as longer.
Q39)	(a) He needed to go against gravitational force. (b) The brake pads will increase the amount of frictional force between the brake pads and the spinning rim, causing the kinetic energy in the spinning rim to be converted to more heat and sound energy, slowing the bicycle down. (c) NO. Oil acts as a lubricant which decreases the amount of friction between the brake pads and the spinning rim, hence, making the bicycle slow down slower.
Q40)	

Q41)	(a) Magnet. (b) The like poles of bar A and the magnet were facing other and repelled, causing the magnet to exert a greater force on the balance. (c) P