



2019 PRIMARY 6 PRELIMINARY EXAMINATION

Date: 23 August 2019

Time: 8.00 a.m. - 9.45 a.m.

Duration: 1 hour 45 minutes

SCIENCE

BOOKLET A

INSTRUCTIONS TO CANDIDATES

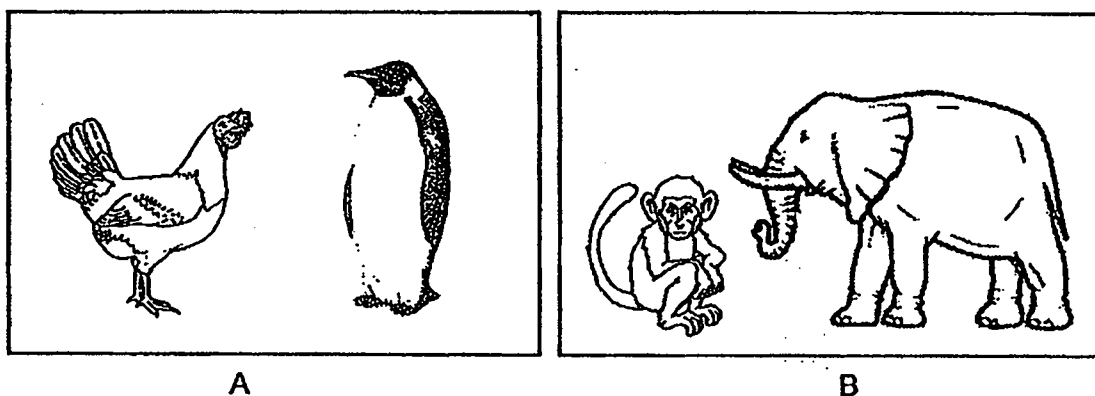
1. Write your name, class and register number.
2. Do not turn over this page until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Shade your answers on the Optical Answer Sheet (OAS) provided.

Booklet A (28 x 2 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) and shade your answer on the Optical Answer Sheet.

(56 marks)

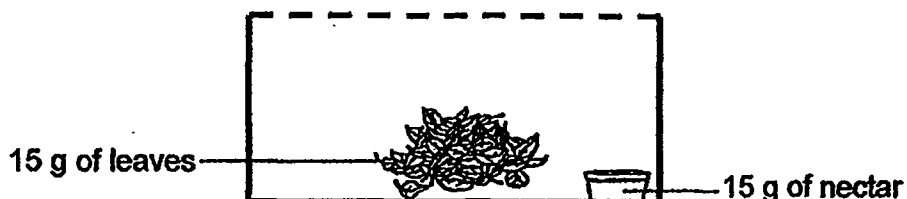
1. Study the animals in group A and B, as shown below.



Which of the following describes the animals in group A and B?

	Group	Covered with hair	Lay eggs
(1)	A	Yes	Yes
(2)	A	No	Yes
(3)	B	No	No
(4)	B	Yes	Yes

2. Bala has butterflies of three different stages. Each was placed separately into similar containers, A, B and C. Each container has 15 g of leaves and 15 g of nectar as shown below.



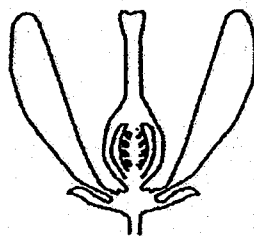
The results after five days are shown in the table below.

Container	Amount of green leaves left (g)	Amount of nectar left (g)
A	15	15
B	5	15
C	15	5

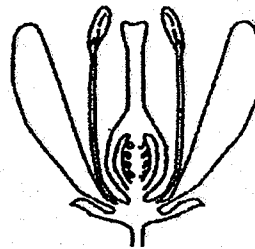
Which of the following shows the correct stage of the butterfly in each container?

	Container A	Container B	Container C
(1)	larva	pupa	adult
(2)	adult	larva	pupa
(3)	pupa	larva	adult
(4)	pupa	adult	larva

3. Study the two flowers as shown below.



Flower A



Flower B

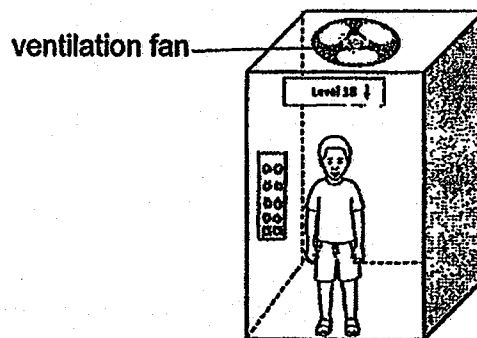
After one month, both flowers A and B developed into fruits.

Which of the following statement(s) is/ are correct?

- A Only flower B can produce pollen grains.
- B Both flowers have male and female reproductive organs.
- C Ovules from both flowers can develop into seeds after fertilisation.

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

4. In a power disruption, Bala was trapped in a lift. The ventilation fan stopped working, no air can enter or leave the lift. After one hour, he started to feel unwell.

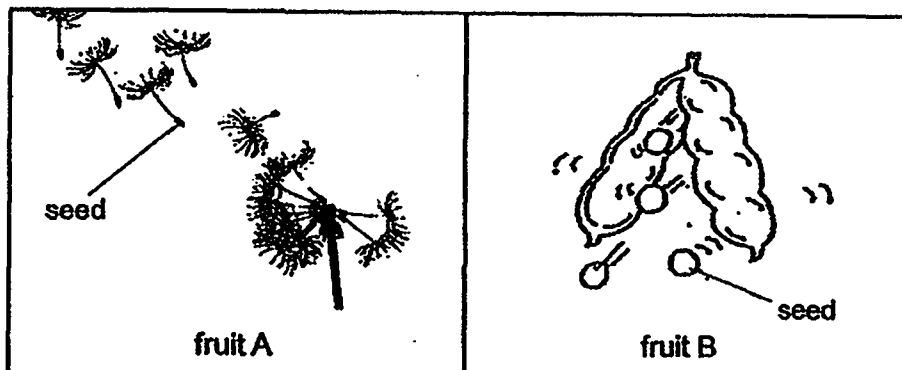


Which of the following statement(s) describe(s) what was happening to Bala?

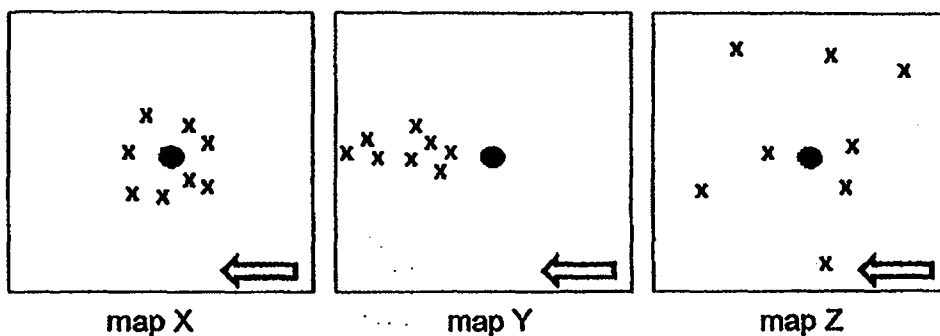
- A Bala's breathing rate increases.
- B The amount of oxygen entering Bala's lungs decreases.
- C The amount of carbon dioxide entering Bala's lungs decreases.

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

5. Study the characteristics of fruit A and B of different plants below.



Below are three maps showing the distribution of seeds.

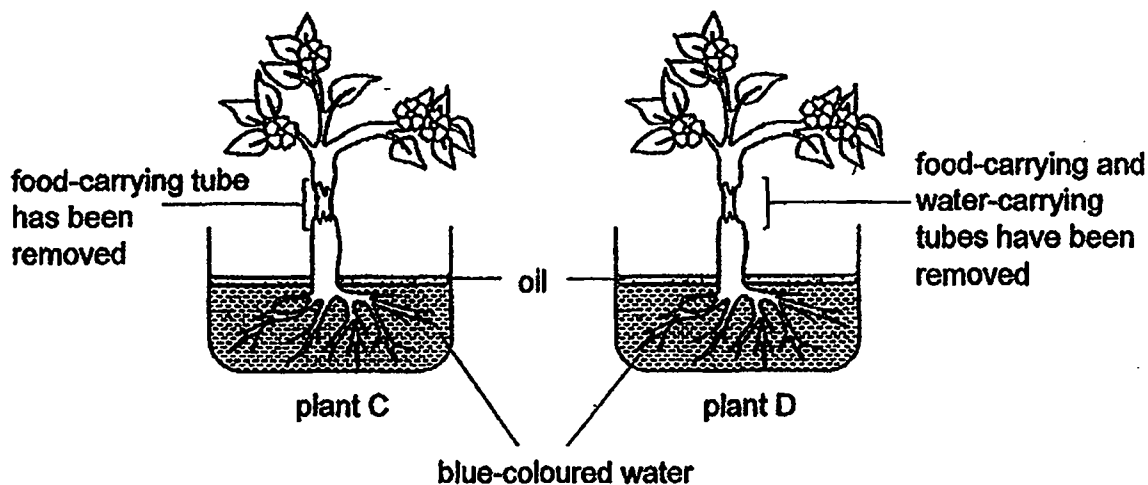


Key
 : wind direction
 ● : parent plant
 x : seed

Which of the following maps correctly matches how the seeds of fruit A and B are dispersed?

	fruit A	fruit B
(1)	map Y	map X
(2)	map Y	map Z
(3)	map X	map Z
(4)	map Z	map X

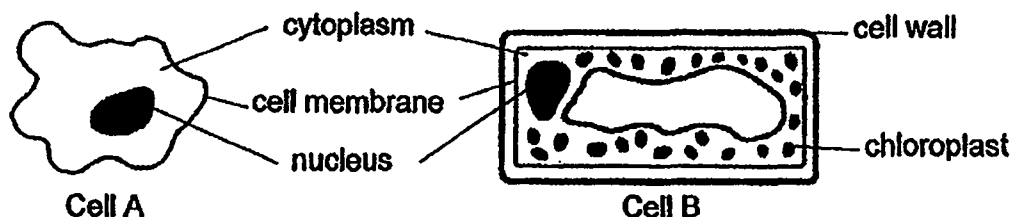
6. Mable prepared two set-ups as shown below.



What will be the colour of the leaves of plants C and D after a few days?

	leaves of plant C	leaves of plant D
(1)	remained green	turned blue
(2)	turned blue	remained green
(3)	remained green	remained green
(4)	turned blue	turned blue

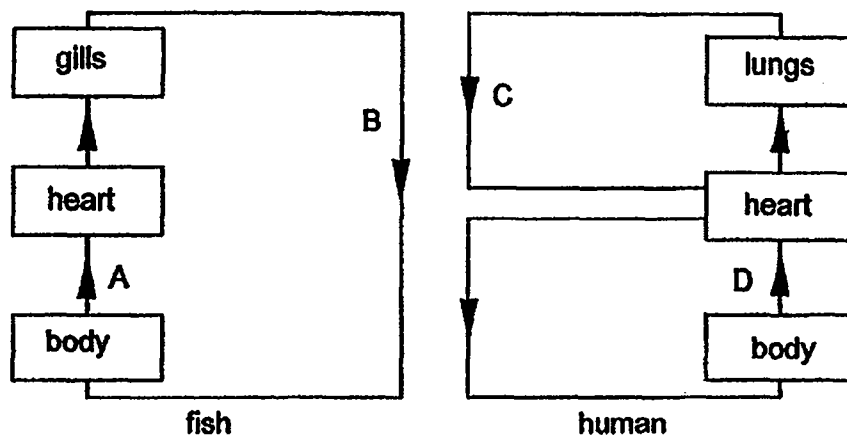
7. The diagrams below show two different cells, A and B.



Which of the following statements about cell A and cell B is correct?

- (1) Both cells have fixed shape.
- (2) Both cells can photosynthesize.
- (3) Only cell B can reproduce by itself but not cell A.
- (4) Only certain substances can move in and out of both cells.

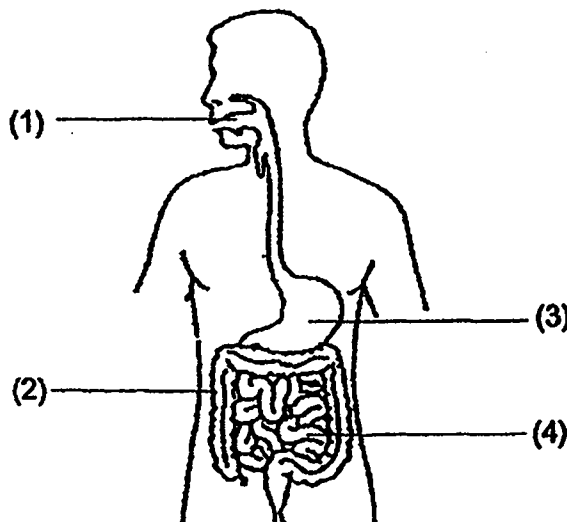
8. The diagrams below shows how blood flows in the body of a fish and a human.



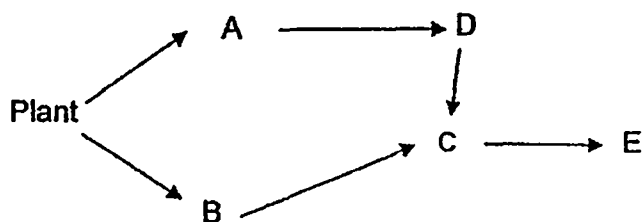
At which parts A, B, C or D, is the blood rich in oxygen in the fish and human respectively?

	Rich in oxygen	
	Fish	Human
(1)	B	C
(2)	A	D
(3)	A	C
(4)	B	D

9. Which part of the human digestive system does not have any digestion taking place?



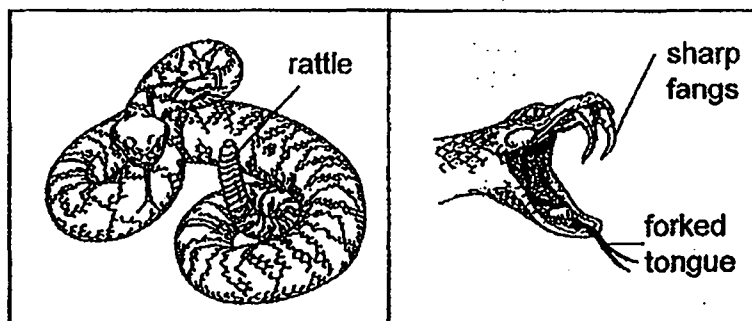
10. Study the food web below.



Which of the following shows how populations of A and B are immediately affected if population of C is wiped out by a disease?

Changes in population size		
	A	B
(1)	increases	decreases
(2)	increases	increases
(3)	decreases	decreases
(4)	decreases	increases

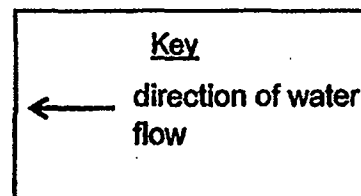
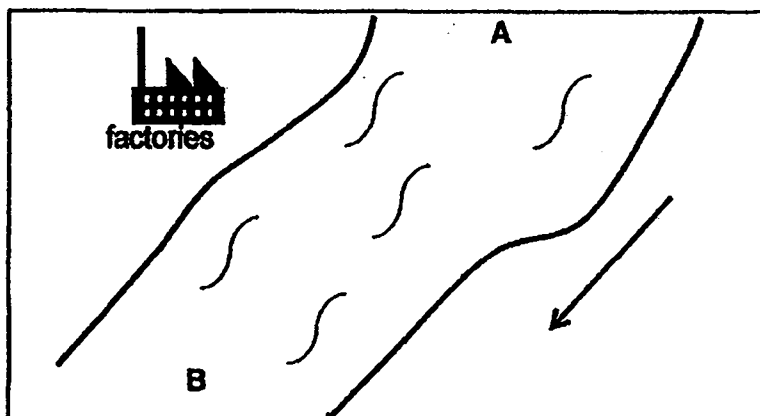
11. Snake R is well-adapted to survive in its habitat. The rattle at its tail will make a sound when it is alarmed.



Which of its adaptations are grouped under the correct heading?

Adaptation		
	Structural	Behavioural
(1)	Wait silently to attack	Shake its rattle to warn off its predators
(2)	Shake its rattle to warn off its predators	Forked tongue to sense changes
(3)	Sharp fangs to inject poison into its prey	Wait silently to attack
(4)	Forked tongue to sense changes	Sharp fangs to inject poison into its prey

12. Susan collected equal amount of water from point A and B of a river. She found three types of organisms, X, Y and Z in her water samples.



Point	Number of organisms in the water		
	X	Y	Z
A	100	40	70
B	5	80	70

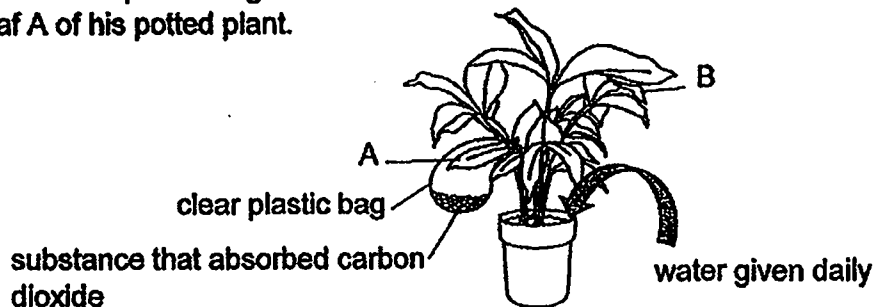
The factories discharged substance W into the river.

Susan wanted to find out the effect of substance W on the organisms.

Based on her results, which of the following is a possible conclusion?

	W is useful to	W is harmful to	W has no effect on
(1)	Y	Z	X
(2)	X	Y	Z
(3)	Z	X	Y
(4)	Y	X	Z

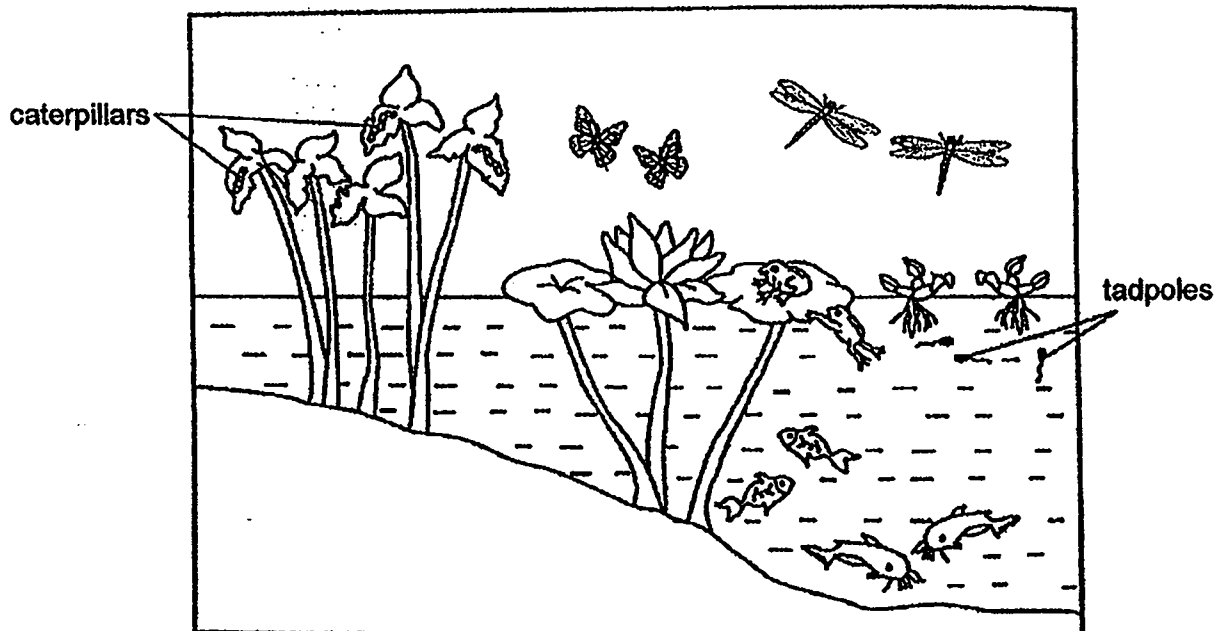
13. Ravi has a potted plant that had been placed in the dark for two days. He then tied a clear plastic bag with a substance which absorbs carbon dioxide around leaf A of his potted plant.



Then he placed the potted plant in the sun for another two days before plucking leaf A and B to test for starch. The iodine solution turned dark blue on leaf B but remain yellowish brown on leaf A.

Which of the following is the aim of Ravi's experiment?

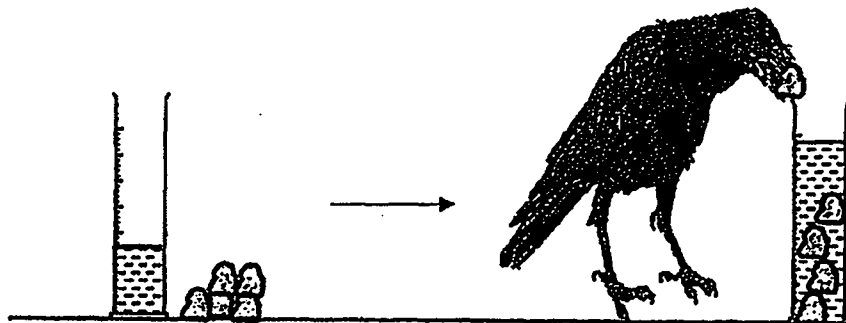
- (1) To find out if sunlight is needed for photosynthesis.
 - (2) To find out if carbon dioxide is needed for photosynthesis.
 - (3) To find out if carbon dioxide is released during photosynthesis.
 - (4) To find out if photosynthesis affects the amount of oxygen produced.
14. The diagram below shows a pond habitat.



Which of the following statements is correct?

- (1) There are 4 populations of producers.
- (2) There are 5 populations of consumers.
- (3) There are 7 populations of consumers.
- (4) There are 10 populations of living organisms.

15. The diagram below shows a crow dropping small pebbles into a cylinder to obtain water to drink.



As the pebbles are dropped into the cylinder, the water level increases.

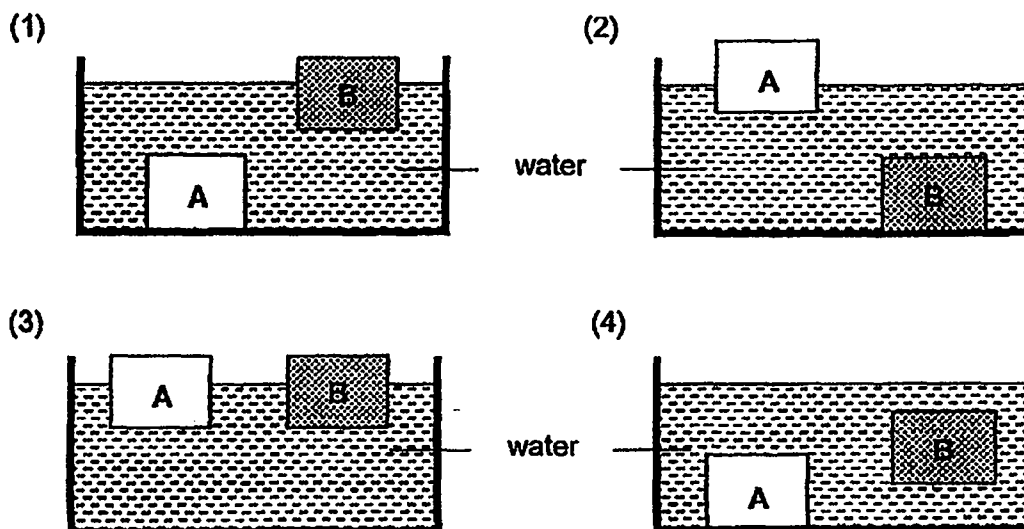
Which of the following is a reason why the water level increases?

- (1) The pebbles have mass.
- (2) The mass of the water increases.
- (3) The volume of the water increases.
- (4) The pebbles take up the space in the water.

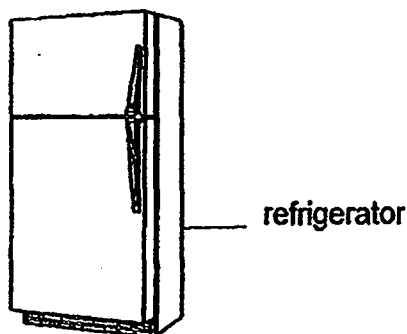
16. Tom placed two sealed containers that were fully filled with air and sand into a swimming pool.



Which of the following diagrams shows the correct positions of containers, A and B, in the swimming pool?



17. The amount of electrical energy used by a refrigerator can be greatly reduced by observing good conservation practices.



Which of the following action(s) help(s) to conserve electricity?

- A Minimizing the opening of door.
- B Putting hot food into the refrigerator.
- C Setting the refrigerator to the lowest temperature.

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

18. The diagram below shows Nila bouncing a basketball.

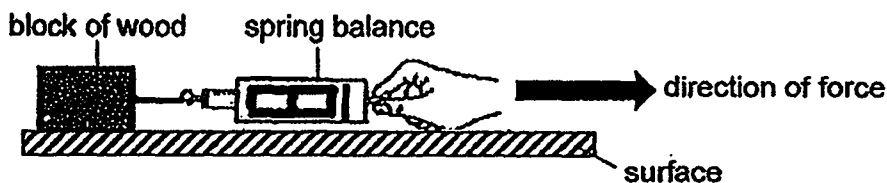


Which of the following statements is incorrect?

- (1) A push force was exerted on the basketball.
- (2) When the ball hits the ground, its direction changes.
- (3) A force was exerted by Nila to change the direction of the basketball.
- (4) The gravity acting on the ball is greater as it drops than when it bounces up.

Study the experiment below and answer questions 19 and 20.

Xiao Ming pulled a block of wood across three different surfaces as shown below.



Xiao Ming recorded the force needed to pull the block across these three surfaces in the table below.

Surface	Force needed to move the block (unit)
X	20
Y	16
Z	14

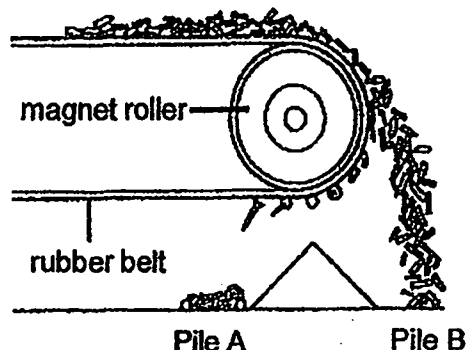
19. Which of the following is the changed variable of the experiment?

- (1) The type of surfaces
- (2) The mass of the block
- (3) The reading on the spring balance
- (4) The amount of force used to pull the block

20. Based on his results, which of the following is true?

- (1) Z has a rougher surface than X.
- (2) The force needed to pull the block on Y is the most.
- (3) More force is needed to pull the block on Y than on Z.
- (4) There is less friction acting between the block and Y than the block and Z.

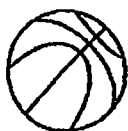
21. In a factory, a pile of metal pieces travels along a moving rubber belt. When these pieces reach the end of the belt where the magnet roller is, they get separated into two piles, A and B.



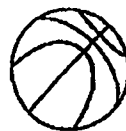
What are the two main forces used to separate the metal pieces into pile A and pile B respectively?

	Pile A	Pile B
(1)	magnetic force	gravitational force
(2)	magnetic force	elastic spring force
(3)	frictional force	magnetic force
(4)	frictional force	gravitational force

22. Jeremy needs to inflate two identical balls. He pumps 20 units of air into ball A and 40 units of air into ball B.



ball A with 20 units of air



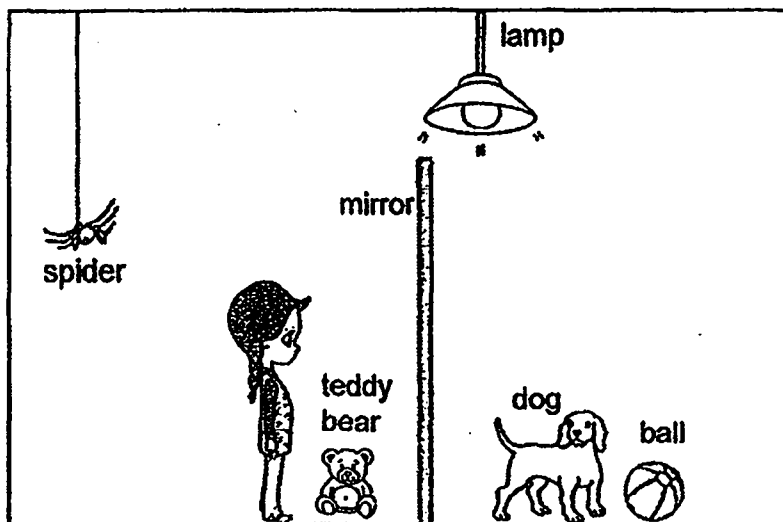
ball B with 40 units of air

He observed that the inflated ball A and ball B have the same size after different amount of air has been pumped into them.

What conclusion can Jeremy make from the above observation?

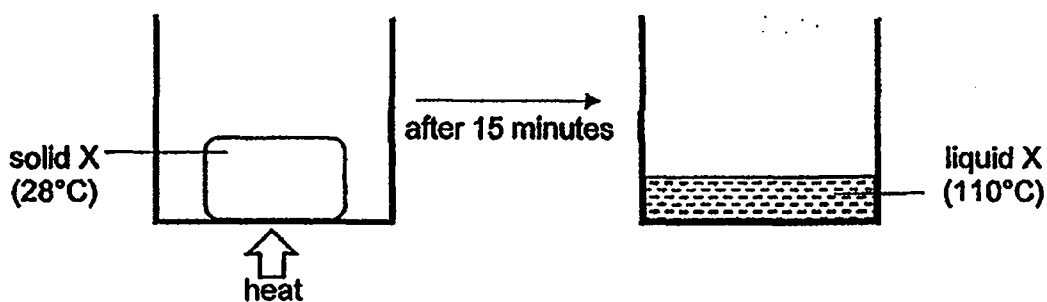
- (1) Air has mass.
- (2) Air is a non-matter.
- (3) Air has definite shape.
- (4) Air can be compressed.

23. Mei Qi is in a well-lit room, standing in front of a mirror as shown in the diagram below.



Mei Qi can see her own reflection in the mirror. Which of the following item(s) will Mei Qi also be able to see in the mirror?

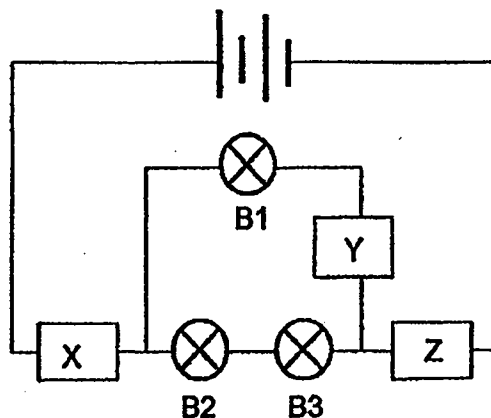
- (1) teddy bear only
 - (2) dog and ball only
 - (3) lamp, dog and ball only
 - (4) teddy bear and spider only
24. Tisha conducted an experiment by heating substance X. At the start, substance X was a solid at 28°C . After 15 minutes of heating, substance X reached a temperature of 110°C as shown below.



Based on Tisha's experiment, which of the following is possible?

	Melting point of X ($^{\circ}\text{C}$)	Boiling point of X ($^{\circ}\text{C}$)
(1)	20	150
(2)	28	100
(3)	30	100
(4)	60	150

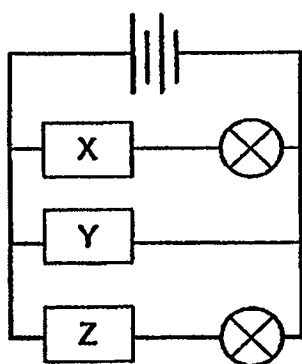
25. Xuan Wen set up a circuit with objects, X, Y and Z as shown.



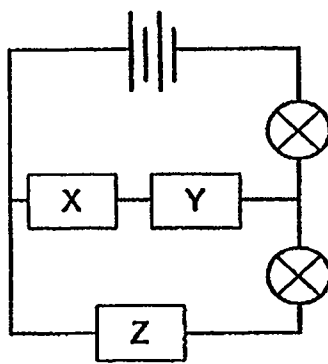
She recorded her observations in the table below.

Does the bulb light up?		
B1	B2	B3
No	Yes	Yes

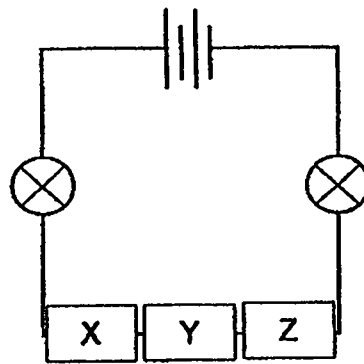
In which of the following circuit(s) will both bulbs remain lit?



circuit A



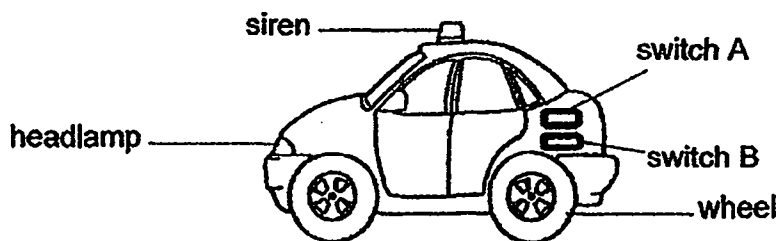
circuit B



circuit c

- (1) circuit A only
- (2) circuit C only
- (3) circuit A and B only
- (4) circuit B and C only

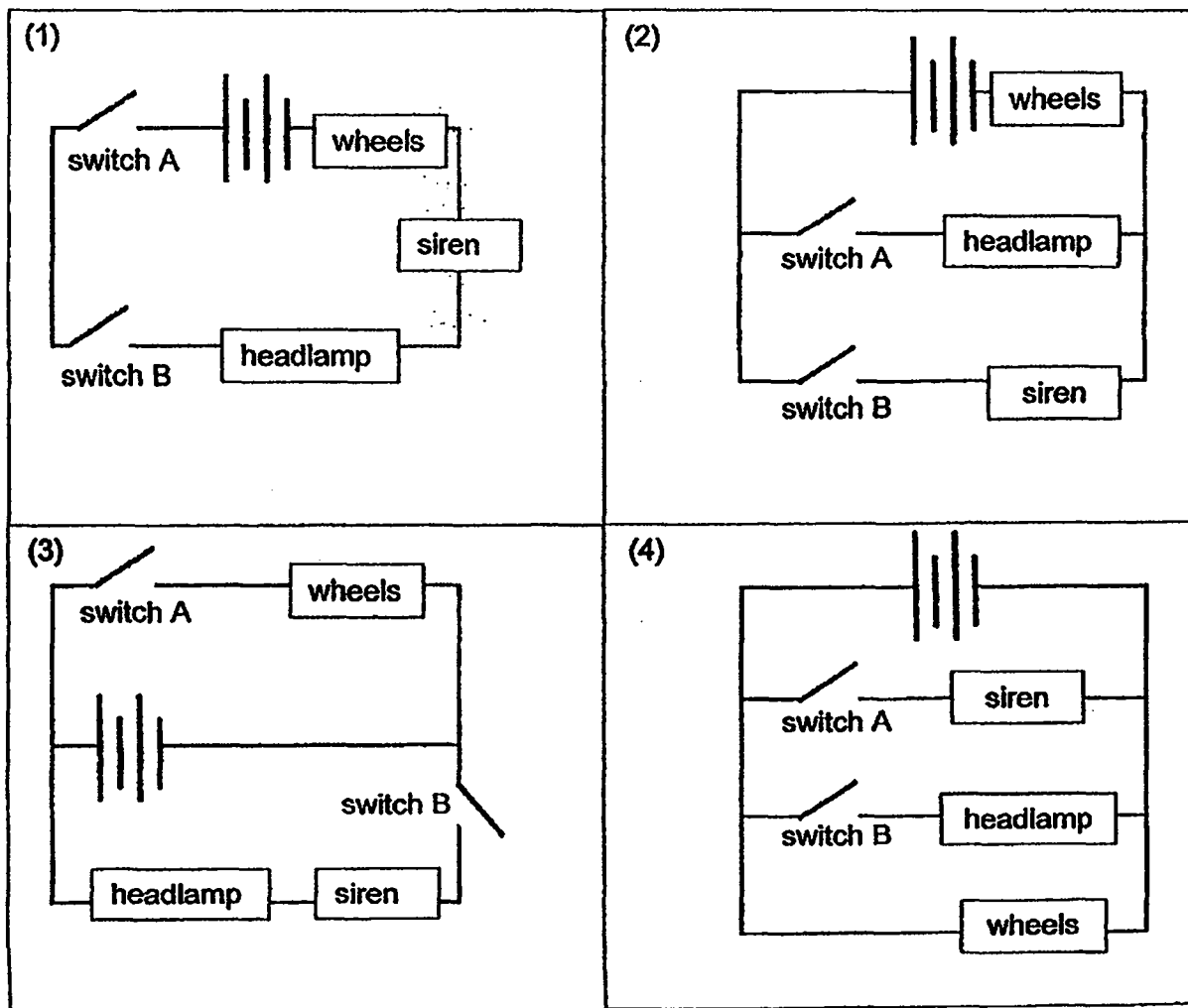
26. Ali has a toy car that works on batteries.



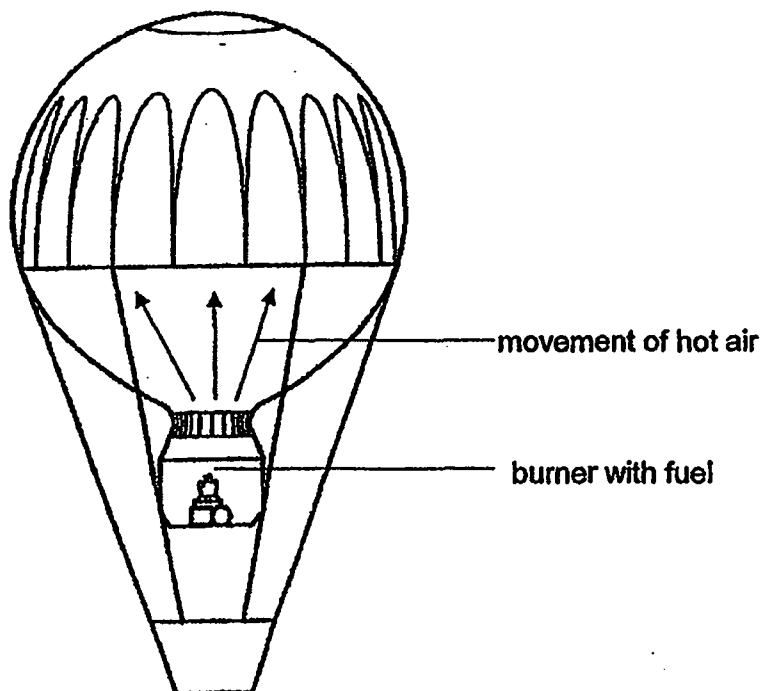
His observations are shown below.

switched on	headlamp	siren	wheels
A only	did not light up	did not sound	spun
B only	lit up	sounded	did not spin
A and B	lit up	sounded	spun

Which of the following circuits is used in Ali's toy car?



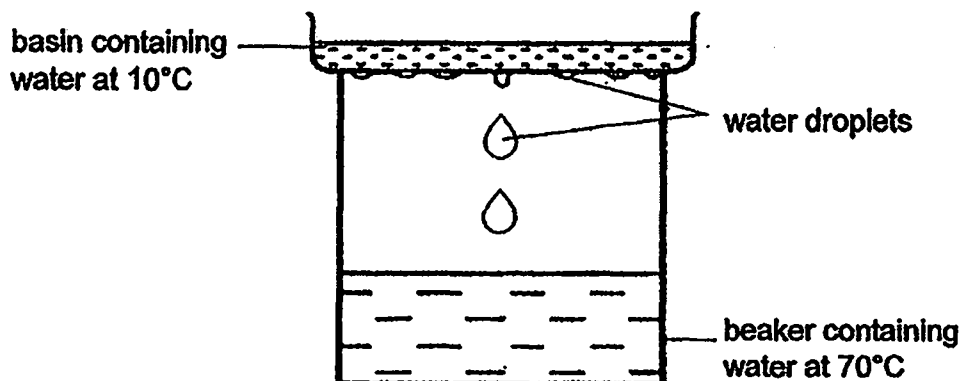
27. A hot air balloon uses hot air to rise. The burner with fuel is lighted. As the fuel burns, the hot air balloon floats up into the sky.



Which of the following best represents the energy conversions involved in making the hot air balloon float into the sky when the fuel is burnt?

- (1) gravitational potential energy → kinetic energy
(balloon) (balloon)
- (2) chemical potential energy → heat energy → kinetic energy
(fuel) (flame) (moving hot air)
- (3) chemical potential energy → light energy → kinetic energy
(fuel) (flame) (moving hot air)
- (4) gravitational potential energy → heat energy → kinetic energy
(balloon) (flame) (balloon)

28. Thomas has a set-up below.



After a while, Thomas observed water droplets forming on the underside of the basin.

What should Thomas do in order to increase the number of water droplets formed on the underside of the basin?

	Basin	Beaker
(1)	Add ice cubes	Add more water at 100°C
(2)	Add ice cubes	Add ice cubes
(3)	Add more water at 10°C	Add more water at 70°C
(4)	Add more water at 100°C	Add ice cubes

End of Booklet A



2019 PRIMARY 6 PRELIMINARY EXAMINATION

Date: 23 August 2019

Time: 8.00 a.m. – 9.45 a.m.

Duration: 1 hour 45 minutes

SCIENCE

BOOKLET B

INSTRUCTIONS TO CANDIDATES

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

Booklet A	56
Booklet B	44
Total	100

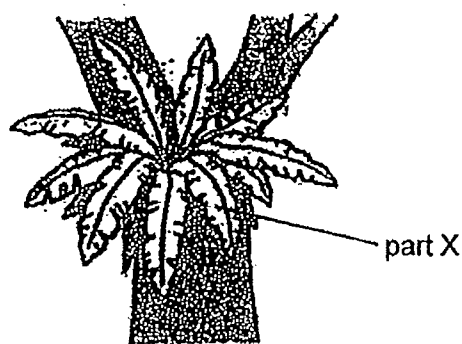
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Booklet B (44 marks)

For questions 29 to 41, write your answers clearly in this booklet.

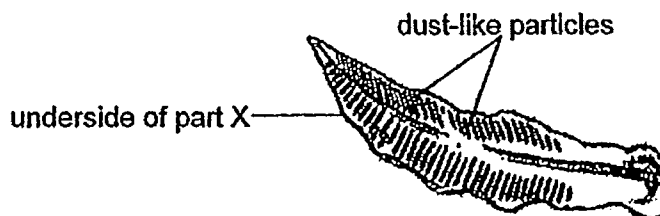
The number of marks available is shown in brackets [] at the end of each question or part question.

29. The diagram shows a bird's nest fern on a tree.



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

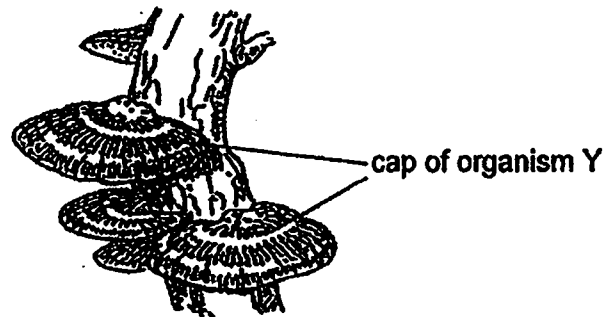
Many rows of small 'bags' containing dust-like particles were observed at the underside of part X as shown in the diagram below.



- (b) Identify these 'dust-like particles'. [1]

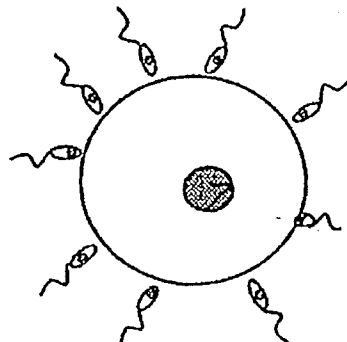
Score	
	2

Organism Y also grows on the tree trunk. Some 'dust-like particles' are also found on the underside of the cap of organism Y.



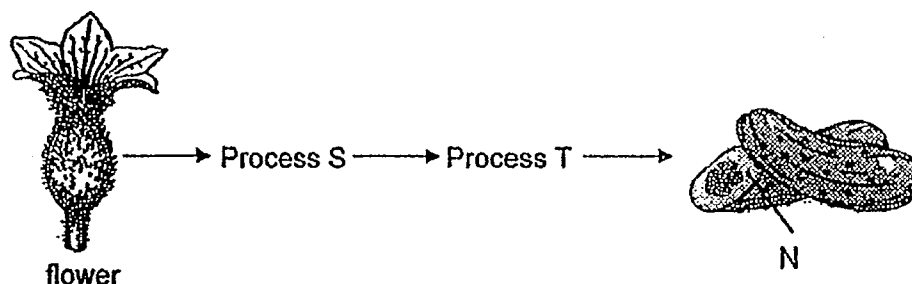
- (c) What is the function of these dust-like particles for both the organism Y and the bird's nest fern? [1]

30. (a) The diagram shows two different types of cells in a process T in the reproduction of an animal. Part M controls all the activities in the animal cells.



Label and identify part M of the two different types of cells in the diagram above. [1]

- (b) Process T also occurs in a plant. The diagram shows how N is developed from a flower of the plant.

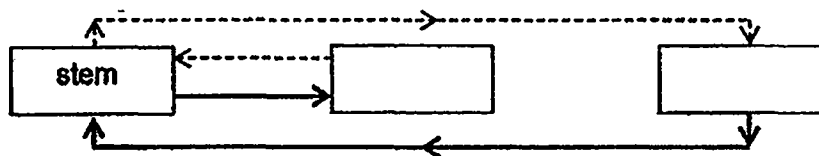


- (i) State the part of the flower that N developed from. [1]

- (ii) Describe process T. [1]

Score	3
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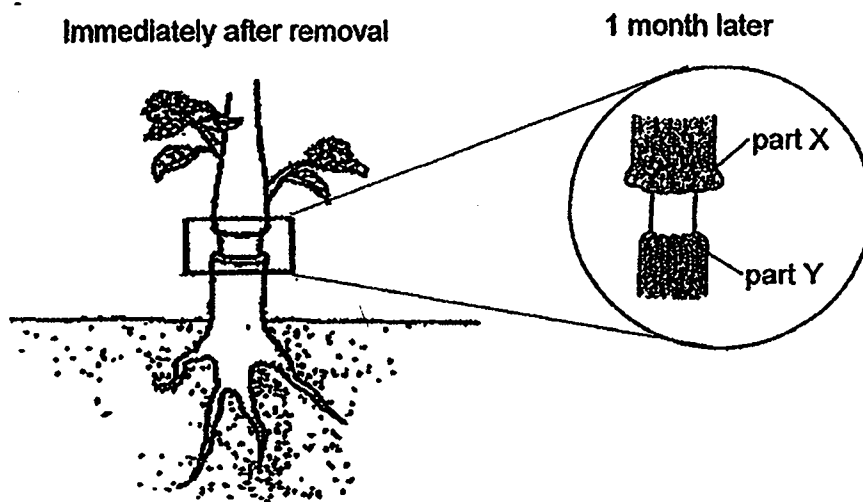
31. (a) The diagram below shows the movement of water and food in a plant.



(---→ represents path of water, —→ represents path of food)

In the diagram above, fill in the correct plant parts in the boxes provided to show the movement of water and food in a plant. [1]

- (b) A ring of the stem of a plant was removed as shown below. Only the food carrying tubes have been removed.

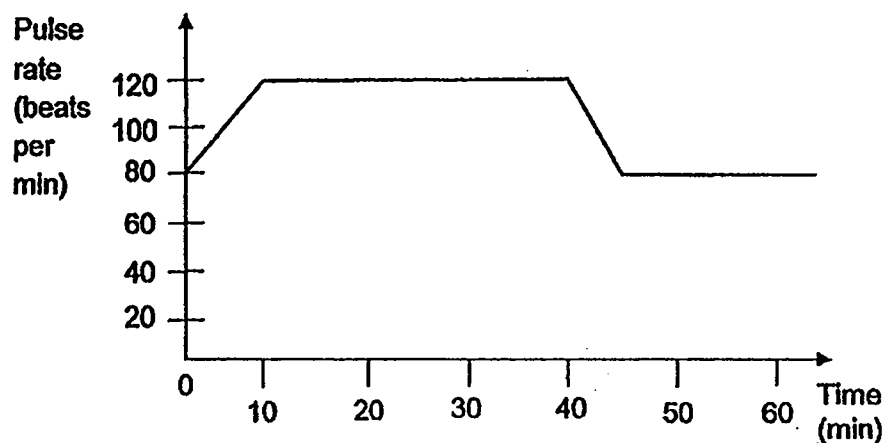


Explain why part X became swollen and part Y had shrunk. [2]

Part X: _____

Part Y: _____

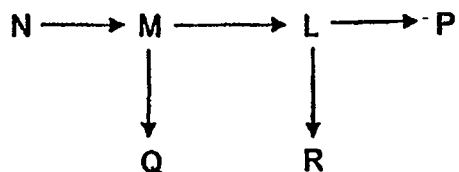
32. Bob started from rest to jog for 40 minutes before he decided to stop. The graph below shows Bob's pulse rate over a period of more than one hour.



- (a) What was Bob's pulse rate when he was at rest? [1]

- (b) Explain why Bob's pulse rate increased during his jog. [2]

33. The food web below is found in a community.



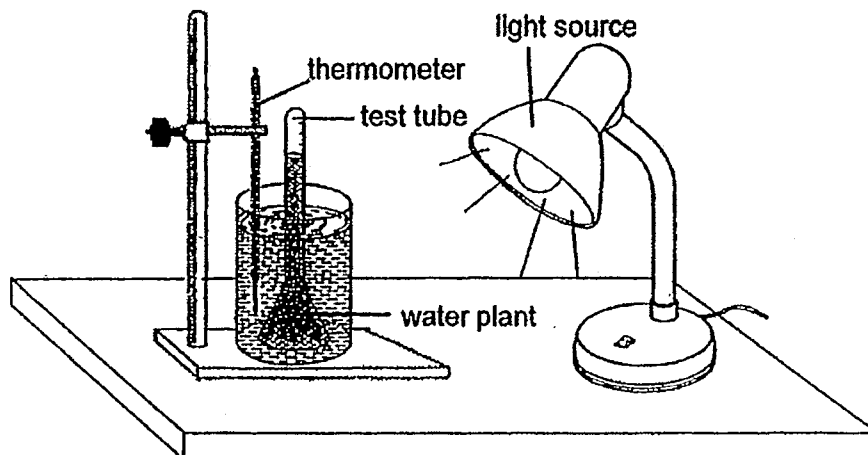
- (a) Based on the food web above, state the relationship between organism M and organism Q. [1]

- (b) Organism K which feeds on organism R was introduced into the community in February. Explain how population of organism P was likely to be affected. [1]

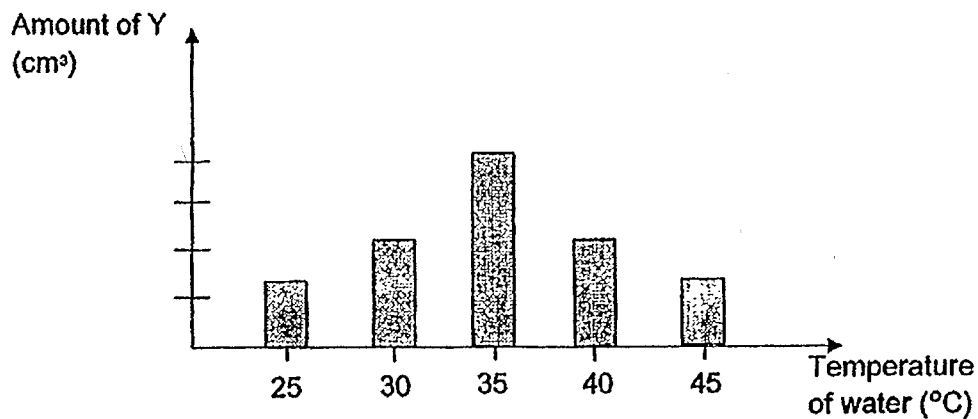
- (c) The habitat of the above community experience a shorter daylight from January to May. Explain how this would affect the population of organism M during these few months. [2]

Score	4
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34. Bala wanted to find out how temperature of water affects the rate of photosynthesis of a water plant. He used the set-up as shown below.



Bala repeated the experiment with water of different temperature. He exposed each beaker of water to a strong light source for an hour. Bala measured the amount of substance Y collected in the test tube in each beaker after an hour. At the end of the experiment, he plotted the graph below.



(a) Name substance Y.

[1]

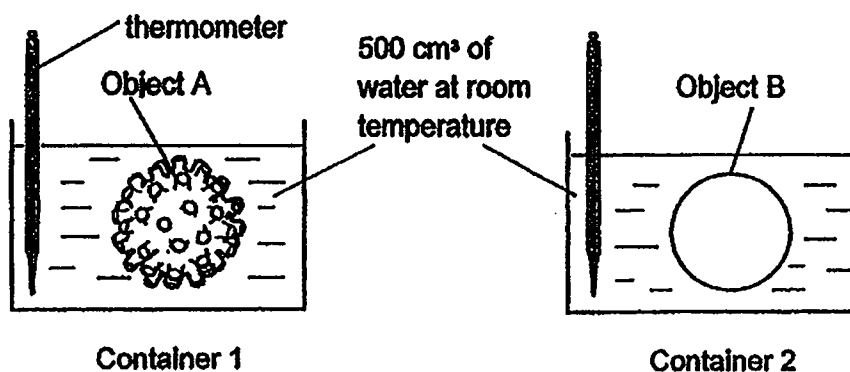
Score	1
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- (b) Based on the graph, describe how the temperature of water affected the rate of photosynthesis of the water plant. [1]

- (c) Using water at 35°C, Bala shifted the light source further away from the water plant. What change would he observe? Explain his observation. [2]

Score	
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35. Objects, A and B, of similar volume and material, were heated in an oven to a same temperature. They were then placed inside two identical containers of water as shown below.



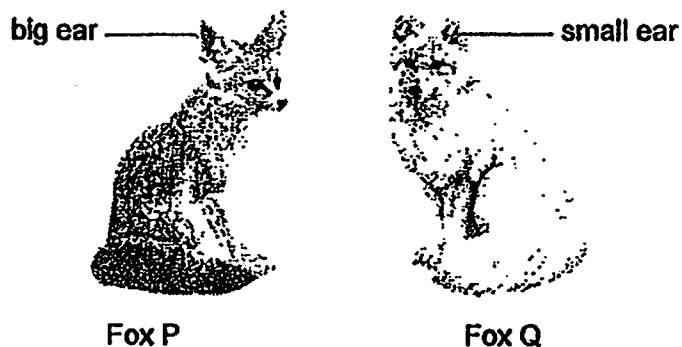
The temperature of the water in containers 1 and 2 were taken at regular time intervals and the results are shown below.

Time (min)	Temperature of water in container 1 (°C)	Temperature of water in container 2 (°C)
0	25	25
5	40	30
10	60	40
15	80	50
20	90	60

- (a) Based on the results, describe the difference in the change in temperature of the water in the two containers over 20 minutes. [1]

- (b) Give a reason for the answer in (a). [1]

Fox P and fox Q live in two different places with extreme temperatures.



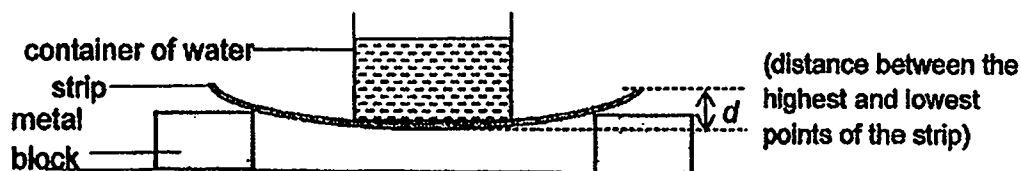
- (c) Based on the results in the table, how does having big ears help fox P to survive better in a hot place? [1]

Fox Q lives in a snow mountain. When it is resting, Fox Q curls its bushy tail around its body as shown in the diagram below.



- (d) Explain how this behaviour helps Fox Q to survive in the extreme cold environment. [2]

36. Zul set up an experiment as shown below to compare a property of three strips of different materials, X, Y and Z. He measured the distance d , when a container of 200 cm³ of water is placed on it.

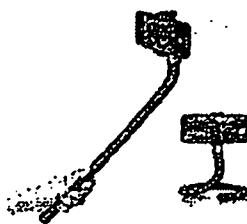


For each strip, he placed a container of 200 cm³ of water on it and measured the distance d . His results are shown below.

Strip	Amount of water in the container (cm ³)	d (mm)
X	200	28
Y	200	12
Z	200	45

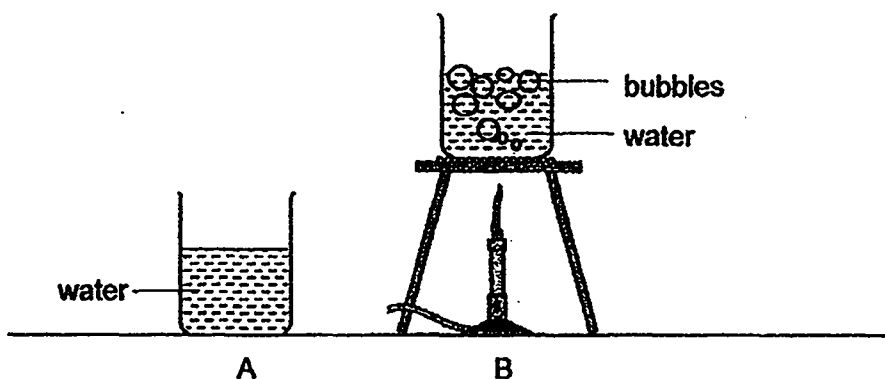
- (a) Based on the results, what property of the materials was Zul trying to find out?[1]

Zul wanted to choose a material to make a selfie stick as shown below.



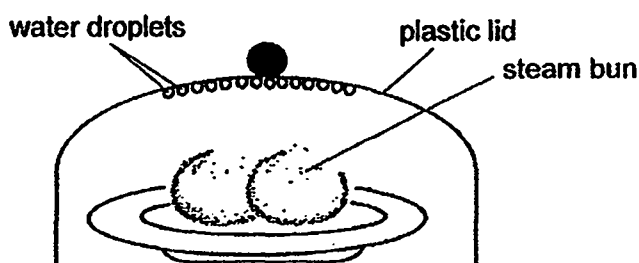
- (b) Based on the results, which strip, X, Y or Z, is most suitable for making this kind of selfie stick. Explain your answer. [1]

37. The diagrams below show two beakers with same amount of water going through two different processes, A and B.



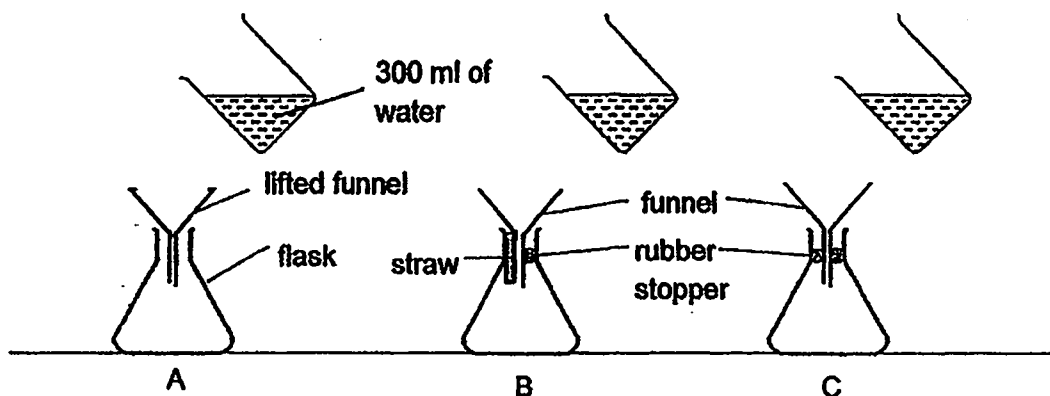
- (a) Identify the processes in A and B and state one difference between the two processes. [1]

Mei Ling steamed two hot buns and placed a plastic lid over them as shown below.



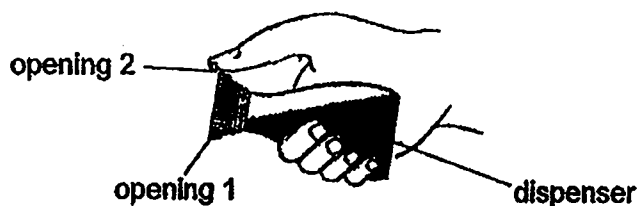
- (b) She observed some water droplets formed immediately at the inner top of the plastic lid. Explain her observation. [2]

38. Sam prepared three set-ups as shown below. He then poured 300 ml of water into each flask.



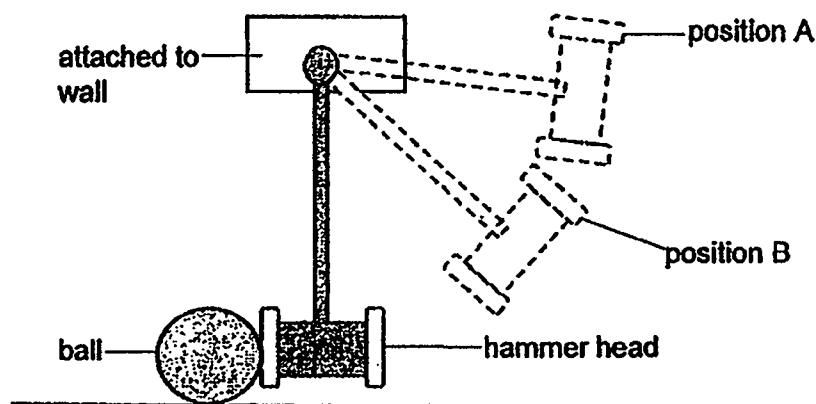
- (a) Based on the diagram above, which flask would he collect the least amount of water in one minute? Explain your answer. [2]

Sam saw his mother covering one of the openings of a soya sauce dispenser with her thumb as shown below. She told Sam that she only wanted to dispense 5 drops of the sauce into a dish.

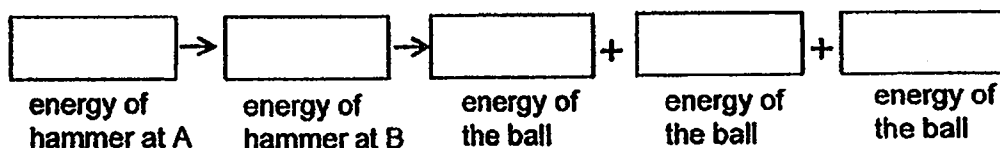


- (b) Based on the above experiment, explain why Sam's mother had to cover one of the openings partially to pour out 5 drops of the soya sauce. [1]

39. The diagram below shows a plastic hammer attached to the wall at one end. It can be lifted up freely to position A and released to hit a ball as shown below.

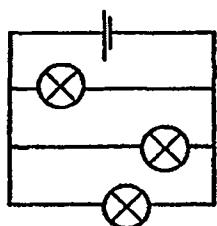


- (a) Fill in the box to show the energy conversion when the hammer moved from position A to position B to when it hit the ball. [1]

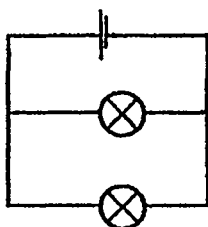


- (b) What would happen to the distance moved by the ball when the hammer head was changed to a heavier one? Explain why. [2]

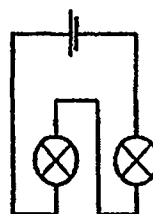
40. Study the circuit diagrams below.



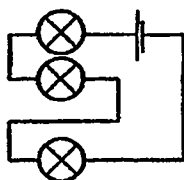
Circuit A



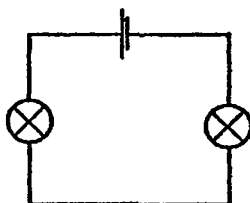
Circuit B



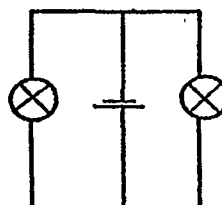
Circuit C



Circuit D



Circuit E

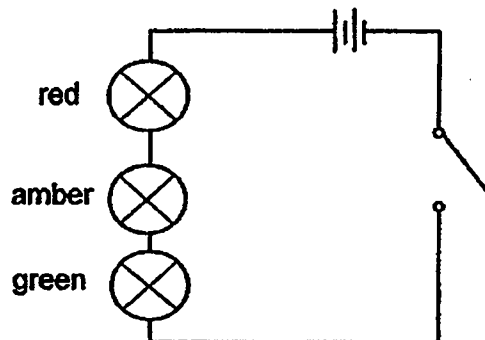


Circuit F

(a) Classify the above circuit diagrams in the table below according to the arrangement of bulbs. [1]

Arrangement in Circuits	
Bulbs arranged in series	Bulbs arranged in parallel

Amal designed and constructed her traffic light circuits using coloured bulbs as shown in the diagram below.



- (b) Explain why this circuit cannot show a change from green to amber then to red, similar to traffic lights. [1]

- (c) Draw a circuit diagram in the box below to show how the above circuit should be arranged so that the change in the colour of the bulbs can take place one at a time. [1]

Score	2
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41. Yixi carried out an experiment on two different types of spring, X and Y, of the same length using the set-up shown in Diagram 1.

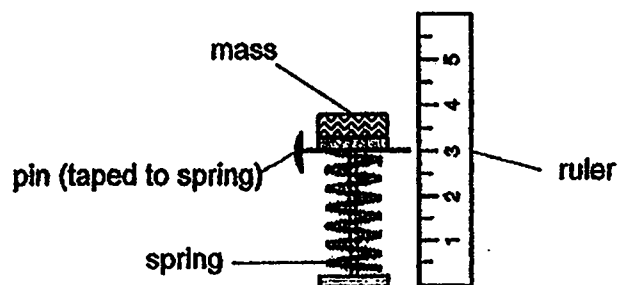


Diagram 1

She measured the compression of the spring after adding a mass. Her results are shown in the table below.

Mass (g)	Length of compression of Spring X (cm)	Length of compression of Spring Y (cm)
100	2.5	1.5
200	4.0	3.0
300	8.5	6.5
400	13.5	9.5

- (a) Based on her results, state the relationship between the mass added and the compression of the springs. [1]

- (b) What is the purpose of the pin? [1]

A spring is used to make a candy dispenser as shown in Diagram 2.

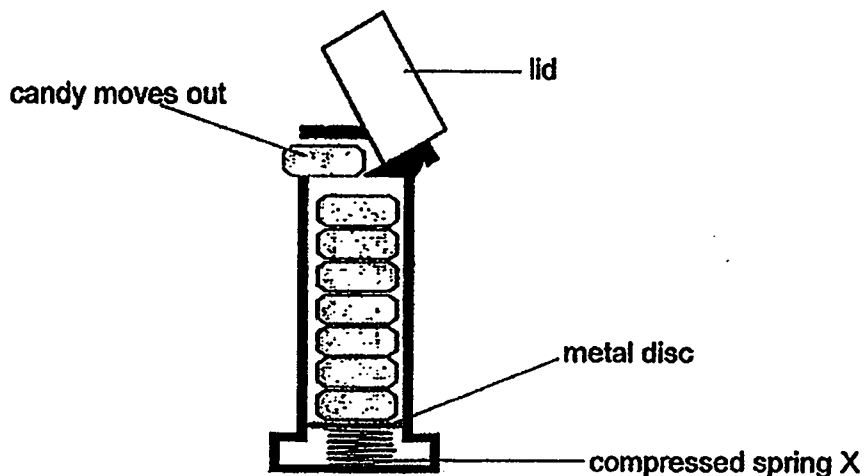


Diagram 2

- (c) When Yixi removed a few pieces of candy quickly from the top, the metal disc moved up continuously. Name two types of force acting on the metal disc. [1]

- (d) Yixi wanted the candy to move up faster. Based on the results in Table 1, which spring, X or Y, should she use in the candy dispenser? Explain why. [2]

Score	
	3

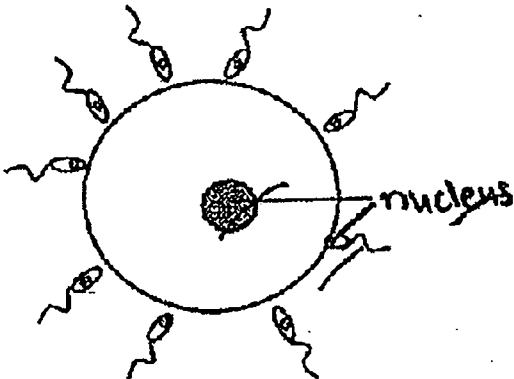
END OF BOOKLET B

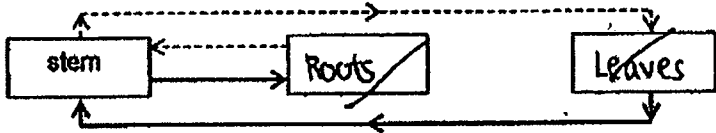
SCHOOL : TAO NAN PRIMARY SCHOOL
 LEVEL : PRIMARY 6
 SUBJECT : SCIENCE
 TERM : 2019 PRELIM

SECTION A

Q 1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
2	3	3	3	1	2	4	1	2	4
Q 11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
3	4	2	2	4	2	1	4	1	3
Q 21	Q22	Q23	Q24	Q25	Q26	Q27	Q28		
1	4	4	4	3	3	2	1		

SECTION B

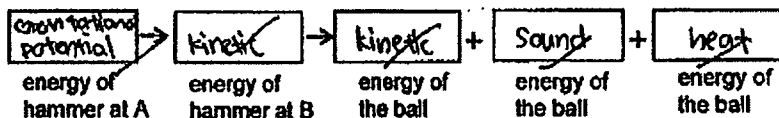
Q29)	a)To trap light and carbon dioxide for photosynthesis to make food for the plant and oxygen to be released. b)Spores c)To allow the organisms to reproduce and the population to survive by dispersing the spores.
Q30)	a) 

	b)i)Ovary ii)The male reproductive cell fuses with the female reproductive cell of the flower.
Q31)	a)  b)Part X : Food from the leaves is not able to be transported to the roots when the food-carrying tubes are removed and accumulates in part X. Part Y : The food carrying tubes in part Y have no more food in them and shrunk.
Q32)	a)80 beats per min. b)Bob used more energy when jogging so more digested food and oxygen needed to be transported to the muscles for energy. Hence, the heart needed to pump faster to transport the increased amount of oxygen and digested food and expel carbon dioxide created by the muscles.
Q33)	a)Organism Q is the predator of organism M. b)One less competitor for the same food source. The population of organism P will increase. There will be less organism R to feed on organism L and the population of organism L increases. Hence, there are more organism L for organism P to feed on and the population will increase. c)The rate of photosynthesis in organism N is reduced as there is less light and some may not survive due to a lack of food. Hence, organism M has less organism N to feed on and the population will decrease.
Q34)	a)Oxygen b)As the temperature of the water increases from 25°C to 35°C, the rate of photosynthesis of the water plant increases. As the

	temperature of the water increases from 40°C to 45°C, the rate of photosynthesis of the water plant decreases. c)The amount of oxygen collected in the test tube will decrease. There is less light for the water plant to trap and use for making food. Hence, the rate of photosynthesis will decrease and respiration occurs slower.
Q35)	a)The temperature of water in container 1 increased faster than the temperature of water in container 2 over 20 minutes. b)Object A had more surface area in contact with the cooler water so the water gained heat faster. c)There is a greater exposed surface area of the body in contact with surroundings so Fox P can lose heat faster in a hot place. d)This reduces the surface area of Fox Q in contact with the cold air and it loses heat slower and can keep warm in its cold environment to survive.
Q36)	a)Flexibility b)Strip Z. Strip Z bent the most when the same amount of water was placed on it, indicating that it is the most flexible. Hence, a selfie stick made of strip Z can be bended into different shapes easily.
Q37)	a)Evaporation and boiling. Evaporation only occurs at the surface of the water but boiling occurs throughout the whole body. b)The water vapour in the air gained heat from the hot buns. When the warmer water vapour came into contact with the cooler plastic lid, it lost heat and condensed into tiny water droplets.
Q38)	a)Flask C. The rubber stopper in C only allows air to escape through the opening of the funnel. Hence, the air in C has the least space to escape when water enters to displace it so the water displaces the air the slowest. b)Less air is allowed to enter to displace the soya sauce dripping out. Hence, the soya sauce drips out slower so Sam's mother can pour out only 5 drops.

Q39)

a)



b) The distance moved by the ball will increase. There is more gravitational potential energy when the hammer head is heavier which is converted to more kinetic energy of the hammer at position B and transferred to more kinetic energy of the ball. Hence, the ball moved a greater distance.

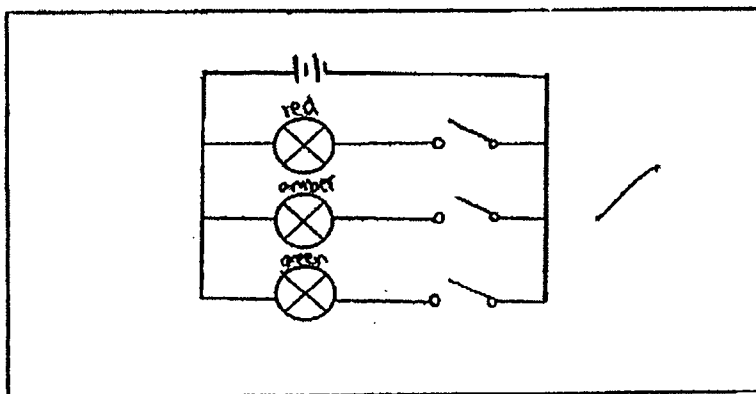
Q40)

a)

Arrangement in Circuits	
Bulbs arranged in series	Bulbs arranged in parallel
C	A
D	B
E	F

b) When the switch is closed, all the bulbs will light up at the same time as electricity can flow through all of them.

c)



Q41)	a)As the mass added increases, the length of the compression of the springs increases. b)To ensure the results of the experiment are accurate as the pin points directly to the marks on the ruler. c)Elastic spring force and gravitational force. d)Spring Y. The length of the compression of spring Y is less than that of spring X when the same mass is placed on it. Hence, there will be more elastic potential energy in spring Y than spring X when there are compressed to the same length that is converted to the kinetic energy of the metal disc which is transferred to the kinetic energy of the candy.
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