Section 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 and shade the oval (1, 2, 3 or 4) on the Optical Answer Sheet.

1. Which of the following is correct of bacteria and non-flowering plants?

	Bacteria	**Non-flowering plants**
(1)	make their own food	make their own food
(2)	do not make their own food	make their own food
(3)	produce spores	produce spores
(4)	produce spores	do not produce spores

( )

2. Which of the following statements about the nucleus are correct?

A: It contains genetic information.

B: It gives the cell a regular shape.

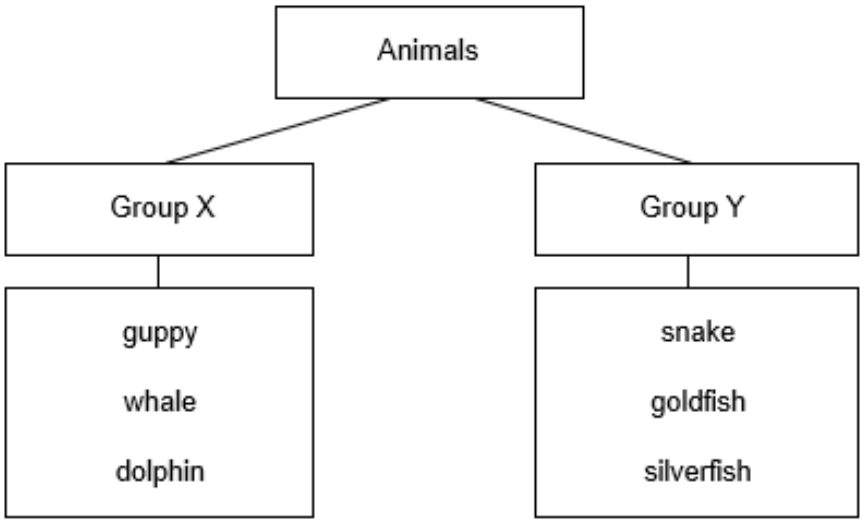
C: It controls all activities that take place in the cell.

D: It controls the movement of substances in and out of the cell.

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

( )

3. Janelle classified the following living things as shown.



Which one of the characteristics was used to classify the living things?

(1) the way they move
(2) the place they live in
(3) the way they reproduce
(4) their outer coverings

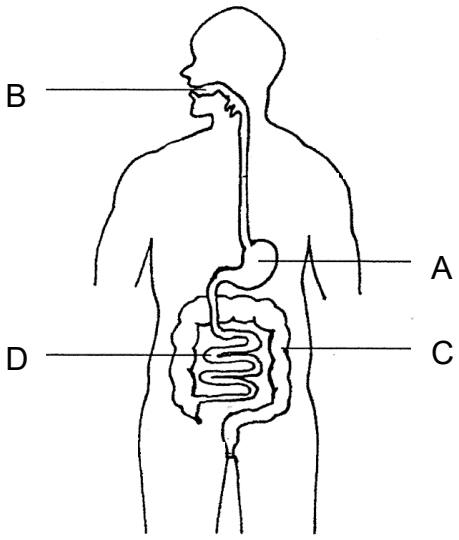
( )

4. Organs A, B, C and D are part of the human digestive system. The table below shows how each organ is involved in digestion.

Function	Organ(s)
Digestion of food	A, B, D
Absorption of food	A
Absorption of water	C

Which of the following correctly shows the organs?

(1)



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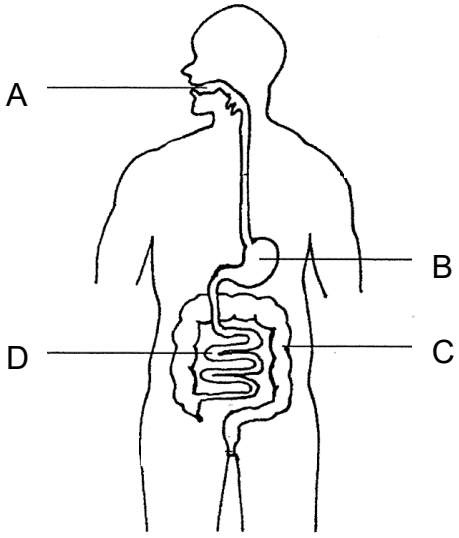

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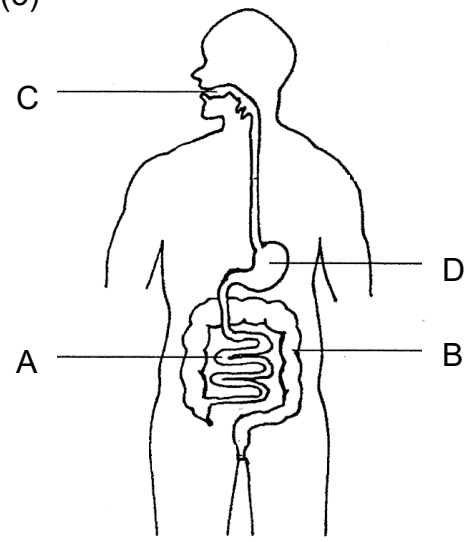

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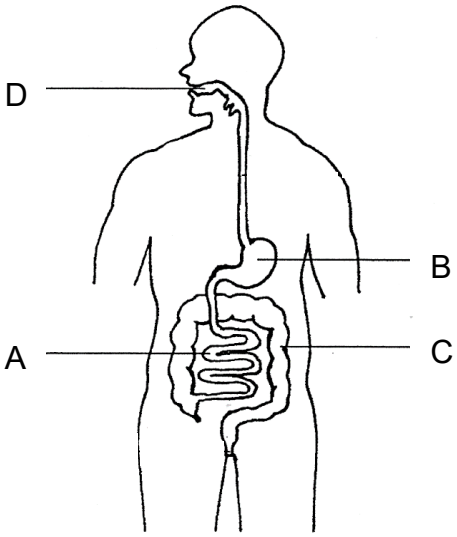
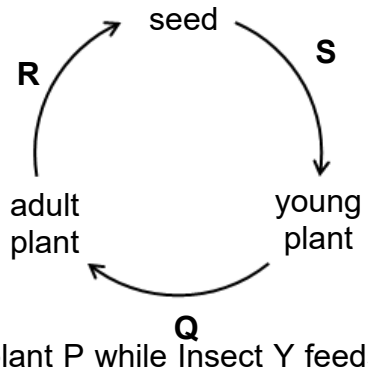


( )

5. The diagram below shows the life cycle of a flowering plant P.



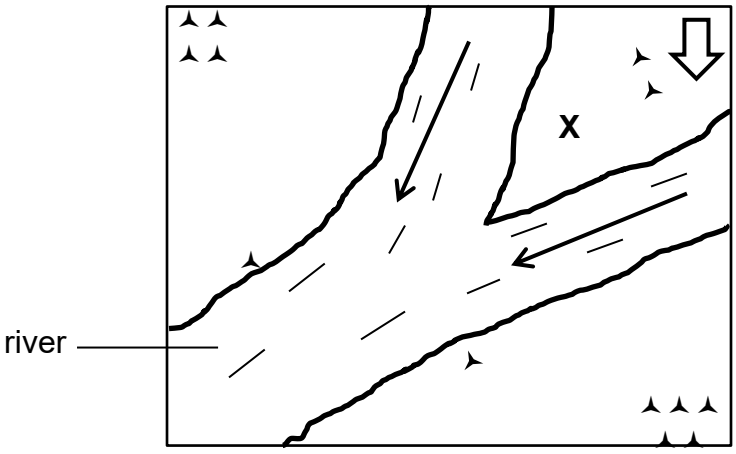
Bird X feeds on the fruits of plant P while Insect Y feeds on the nectar produced by the flowers of plant P.

At which stage, Q, R or S, is there likely to see Bird X and Insect Y visiting plant P?

	Bird X at Stage	Insect Y at Stage
(1)	R	S
(2)	Q	S
(3)	R	R
(4)	S	Q

( )

6. In a particular place, there is a river running through it. The diagram below shows a tree, X and its fruits (⅄).



← Direction of flow

⇩ wind direction

Using the diagram, which of the following is the most likely method of dispersal of the fruit?

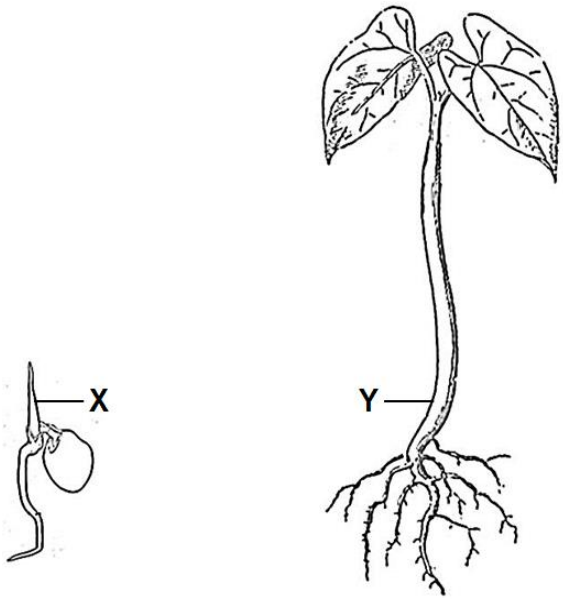
(1) animal

(2) water

(3) wind

(4) splitting ( )

7. The diagram below shows a plant at different stages of growth.

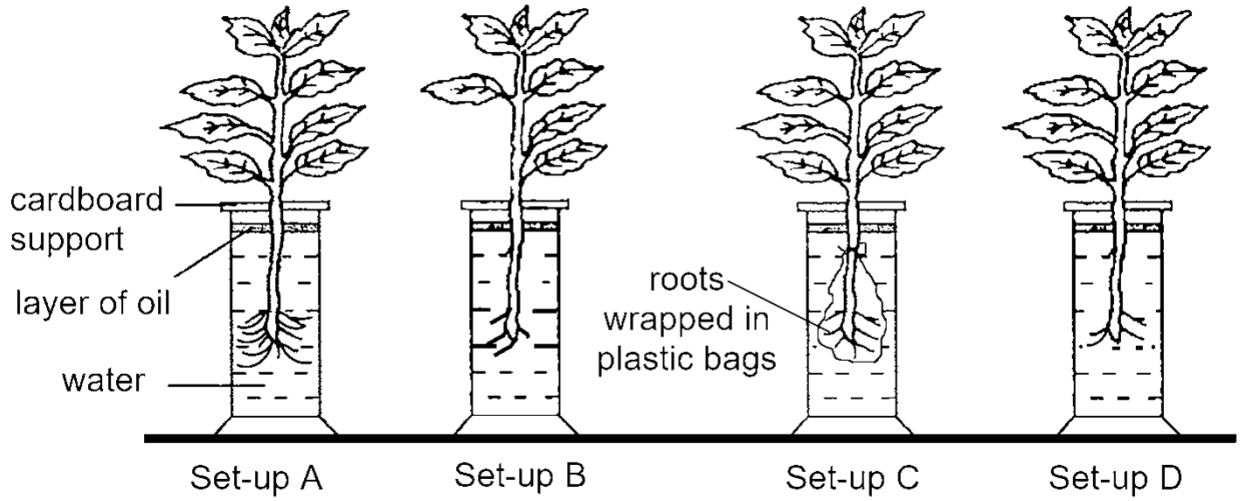


Which of the following shows the direction in which food and water are being transported at X and Y?

	X		Y	
	food	**water**	**food**	**water**
(1)	upwards	upwards	downwards	upwards
(2)	upwards	downwards	upwards	downwards
(3)	downwards	upwards	downwards	upwards
(4)	downwards	downwards	upwards	downwards

( )

8. Ali placed 4 plants in identical jars, each containing the same amount of water as shown below. He then placed the 4 set-ups, A, B, C and D, next to the window for 2



days.

Which of the following shows the correct order of the set-up from the least amount of water to the most amount of water left in the jar?

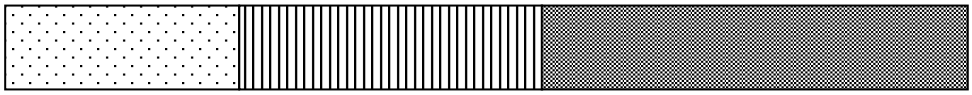
	Least → **Most**			
(1)	C	D	B	A
(2)	A	D	B	C
(3)	A	B	D	C
(4)	C	B	D	A

( )

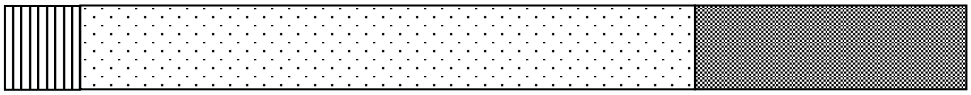
9. Oxygen, nitrogen and other gases are represented by:

Which of the following shows the correct proportion of oxygen, nitrogen and other gases in the air?

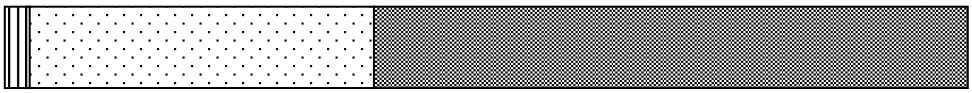
(1)



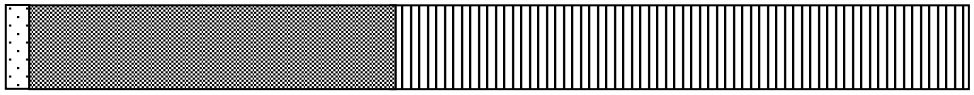
(2)



(3)



(4)



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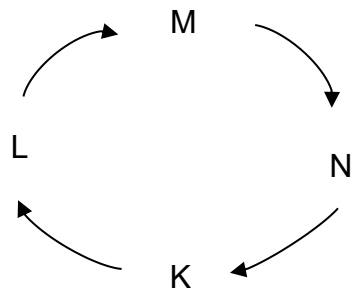
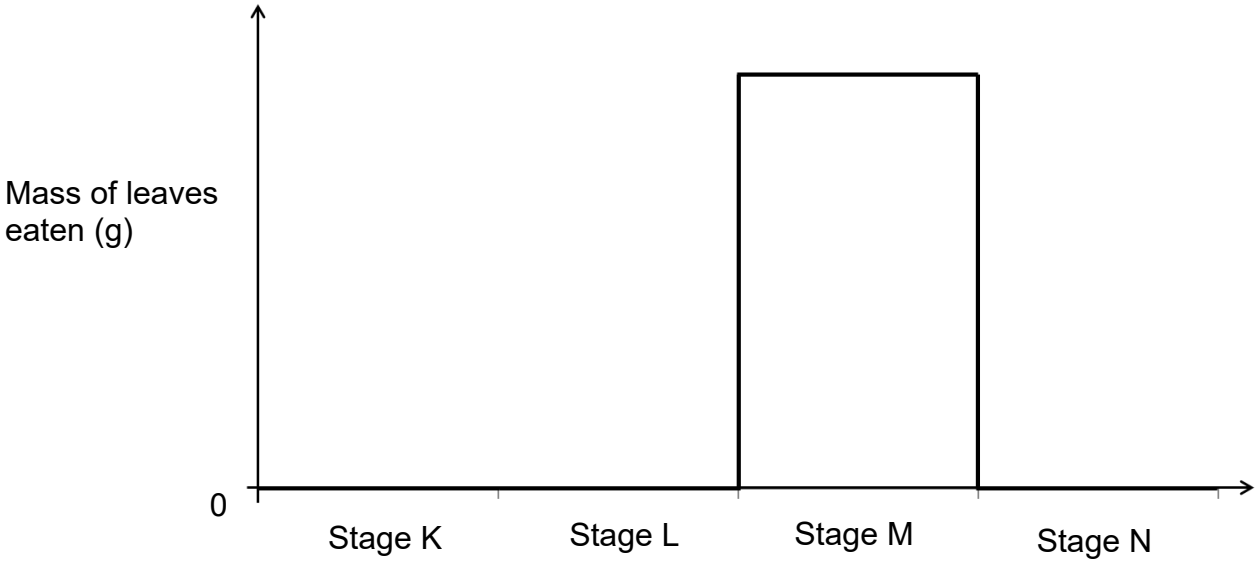
10. K, L, M and N are different stages of the life cycle of a butterfly shown below.



The graph below shows the mass of leaves eaten by the butterfly at the different stages.

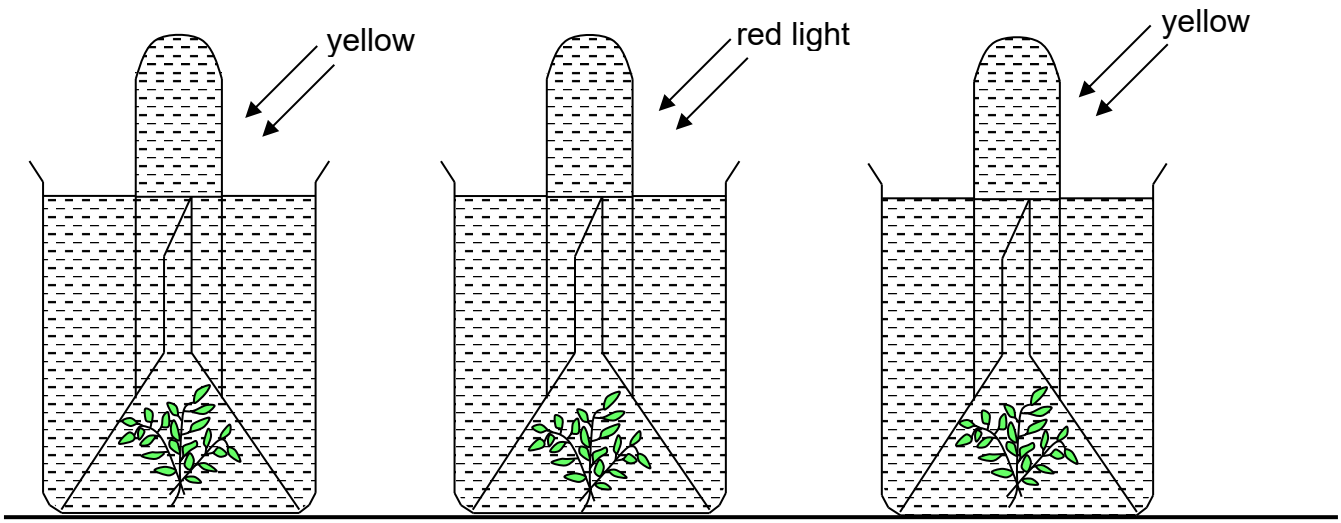


Which stage represents the butterfly at its pupa stage?

(1) Stage K
(2) Stage L
(3) Stage M
(4) Stage N

( )

11. Terence wanted to find out the relationship between the colour of light and the rate of photosynthesis. At the beginning of the experiment, he set up the experiment as shown below.



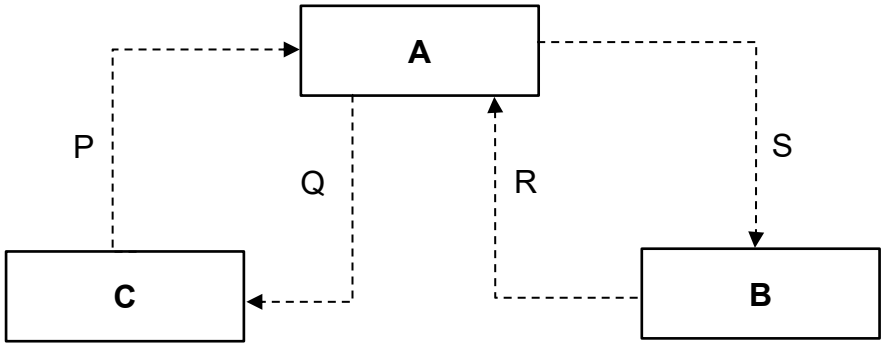
Which of the following should Terence do to make the experiment fair?

A Use light of different intensity for the three set-ups.
B Replace the plants in set-up P with 10 g of cabomba.
C Replace the plants in set-up R with 10 g of hydrilla.
D Use different coloured lights for the three set-ups.

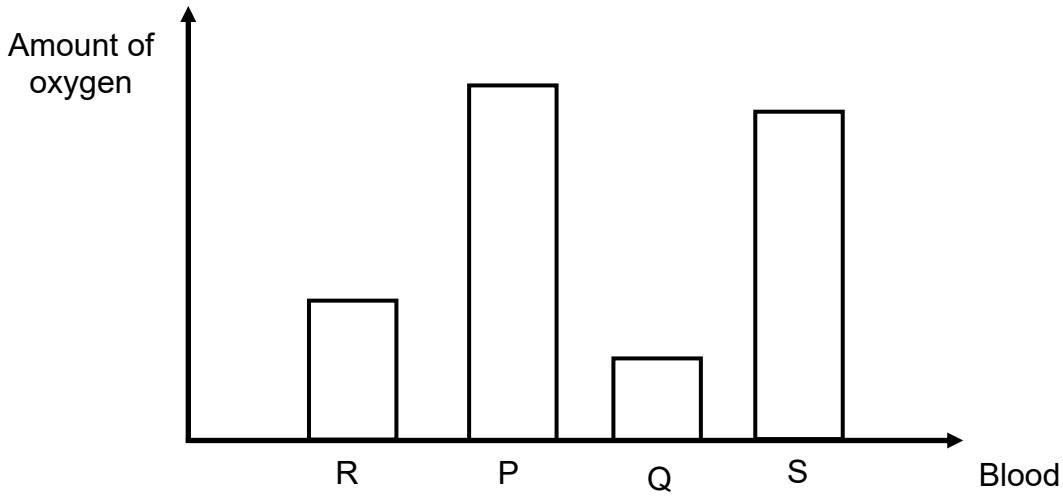
(1) A and B only
(2) A and C only
(3) C and D only
(4) B, C and D only

( )

12. The diagram below shows the direction of blood flow in some parts of the body represented by A, B and C. The blood vessels are represented by P, Q, R and S.



The bar graph below shows the amount of oxygen flowing in blood vessels, P, Q, R and S.

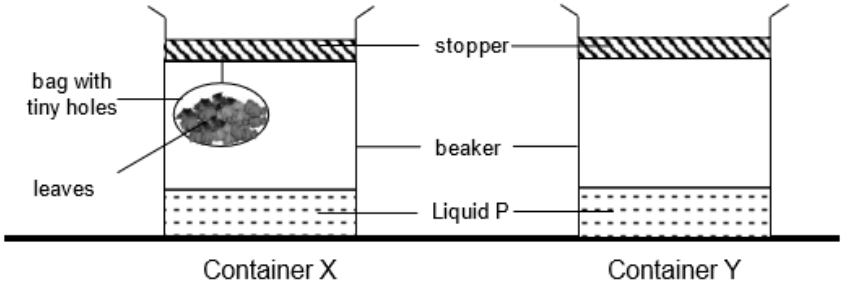


What do A, B and C represent?

	A	B	C
(1)	lungs	other parts of the body	heart
(2)	heart	lungs	other parts of the body
(3)	lungs	heart	other parts of the body
(4)	heart	other parts of the body	lungs

( )

13. Gerald set up an experiment using two containers, X and Y, filled with the same amount of liquid P. Liquid P is red and it turns yellow when the amount of carbon dioxide increases. He placed some leaves in a bag with many tiny holes then hung it in container X. After a few weeks, he observed that liquid P in container X turned yellow but liquid P in container Y remained red.



What had happened to cause liquid P in container X to turn yellow?

(1) The leaves made food.

(2) Evaporation took place.

(3) Decomposition took place.

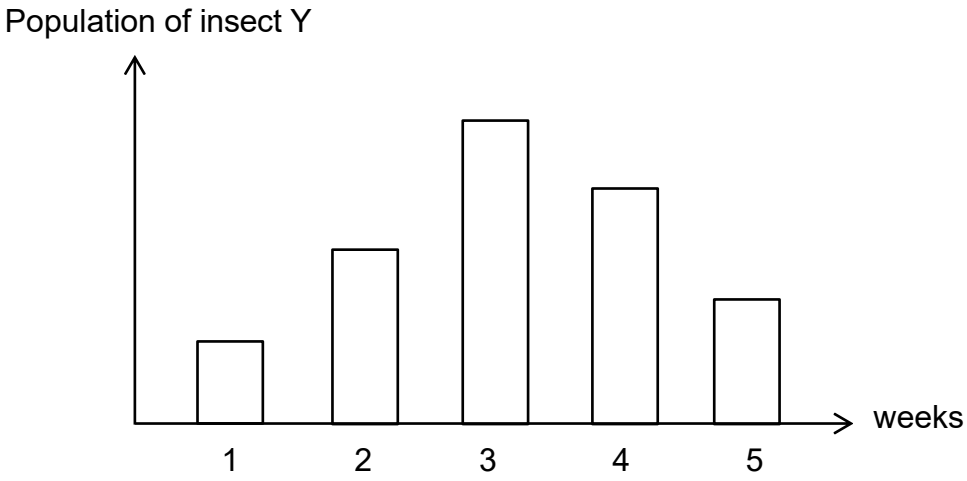
(4) Carbon dioxide entered the container

( )

14. The food relationships among the organisms in a field community is shown below.

plant X → insect Y → bird Z

In the bar graph below, the population of insect Y in the field community was monitored over five weeks.



Which of the following statements best explain the changes in the population of insect Y?

A: More crops were grown in the first two weeks.

B: The population of birds decreased after the 3rd week.

C: There was an outbreak of bird disease in the first two weeks.

D: Less crops were harvested in the field from the 5th week onwards.

(1) A

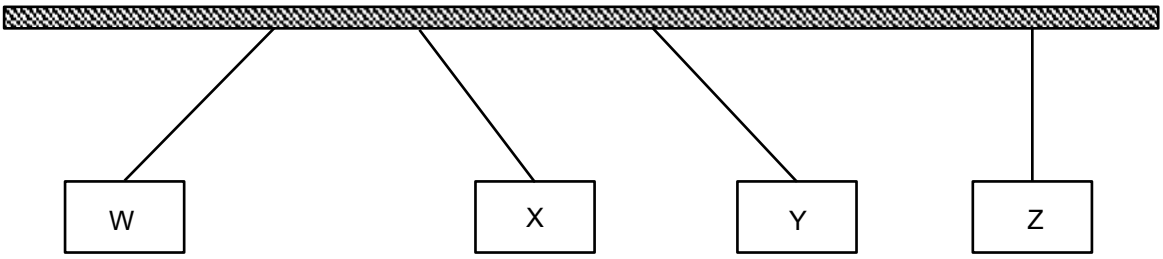
(2) B

(3) C

(4) D

( )

15. Dirga hung four rods on a wooden pole with strings and observed the rods moved as shown below.

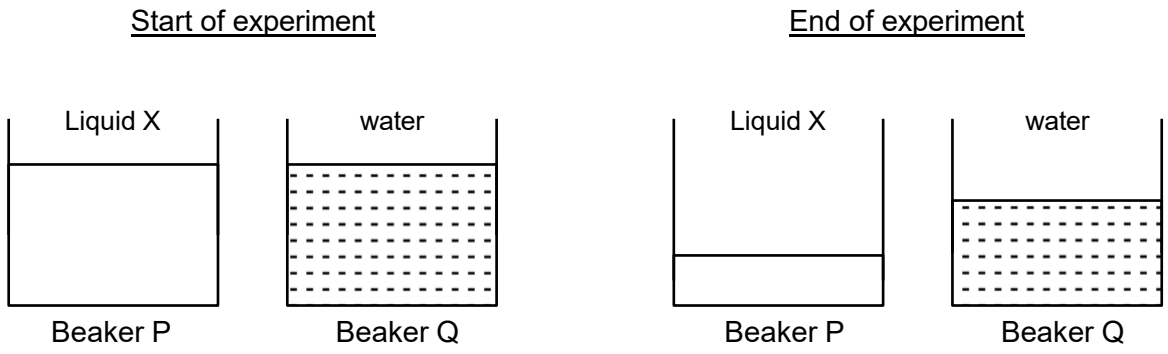


Which of the rod(s) is/are definitely a magnet?

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

( )

16. Two identical beakers were filled with equal volume of Liquid X and water. The beakers were then left under the Sun for three hours. The diagrams below show the amount of liquids in the beakers before and after the experiment.



Which one of the following statements explains the result of the experiment?

(1) Liquid X is lighter than water.
(2) Liquid X evaporates faster than water.
(3) Beaker P is a better conductor of heat than Beaker Q.
(4) Beaker P was placed at a hotter location than Beaker Q.

( )

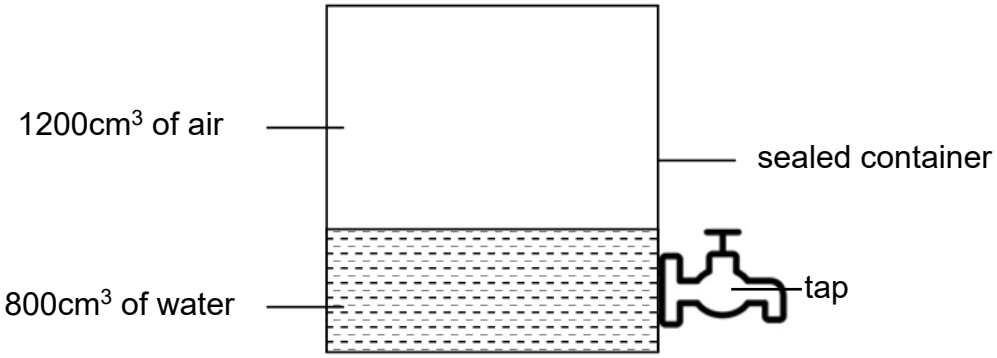
17. Which of the following correctly show what will happen when a piece of ice is melting?

A: The ice gains heat.
B: The ice loses coldness.
C: The temperature of the ice increases.
D: The temperature of the ice remains at 0°C.

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

( )

18. The capacity of the sealed container shown below is 2000cm^3.

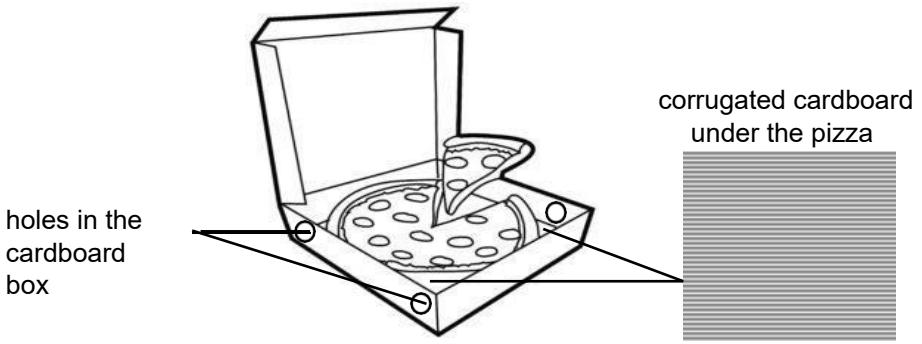


A tap is used to remove 500cm^3 of water. What was the volume of air in the container after 500cm^3 of water was removed?

(1) 800cm^3
(2) 1200cm^3
(3) 1700cm^3
(4) 2000cm^3

( )

19. The diagram below shows a pizza box with some common features.



Which of the following statements best explain the features found in the pizza box?

A: The holes in the pizza box prevents the pizza from becoming soggy by allowing water vapour to escape.

B: The holes in the pizza box keeps the pizza warm by allowing air, which is a poor conductor of heat, to enter the box.

C: The corrugated cardboard under the pizza increases friction between the pizza and the cardboard to absorb the moisture.

D: The corrugated cardboard under the pizza reduces the area of contact between the pizza and the box, slowing down heat loss.

(1) A and D only.

(2) B and C only.

(3) A. B and D only.

(4) B, C and D only.

( )

20. Figure 1 shows a spring. Figure 2 shows what happens when a ball is attached to the spring.

Figure 1

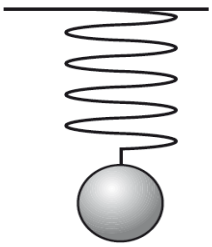


Figure 2

Which of the following shows the direction of the forces acting on the ball and the spring?

	Direction of the force acting on the ball	**Direction of the force acting on the spring**
(1)	↑	↓
(2)	↓	↓
(3)	↓	↑
(4)	↑	↑

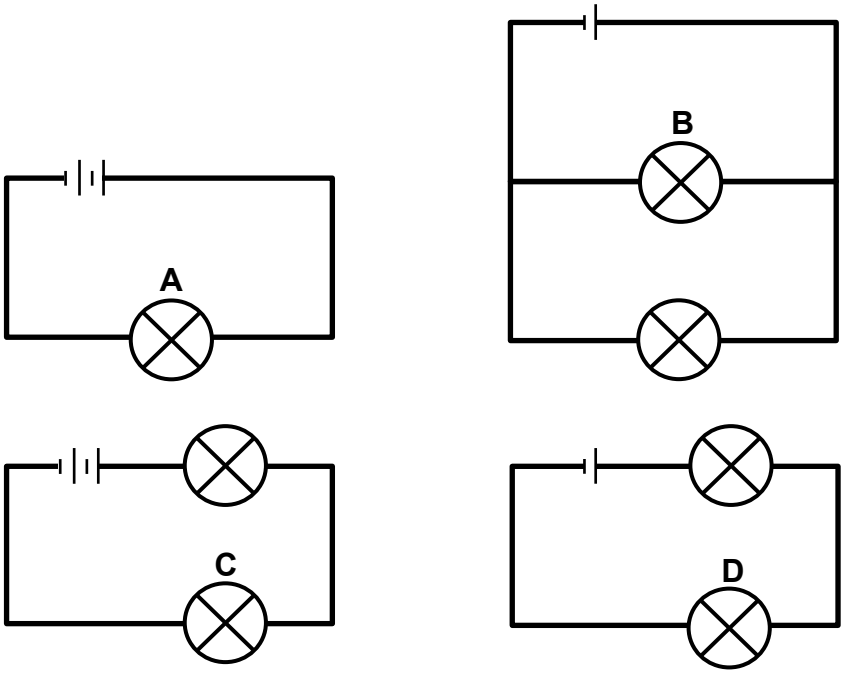
( )

21. Many shopping malls provide plastic bags for wet umbrellas on rainy days. Shoppers are advised to put their wet umbrellas in these bags.

Which property of the plastic bag allows it to perform the function described?

(1) Strength
(2) Flexible
(3) Waterproof
(4) Ability to float ( )

22. The diagram below shows four circuits. All the bulbs and batteries are new and identical.

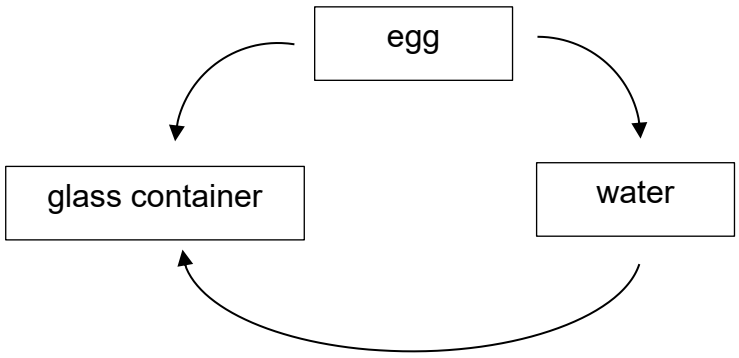


Which of the following two bulbs have the same brightness?

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

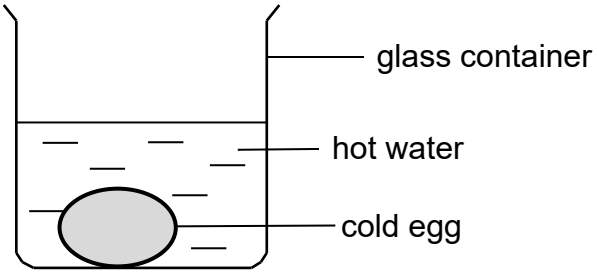
( )

23. The diagram below shows the flow of heat between an egg, water and a glass container.

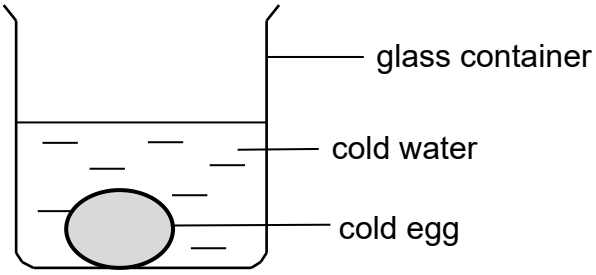


Which of the following diagrams shows the temperature of the egg and water for the flow of heat to happen?

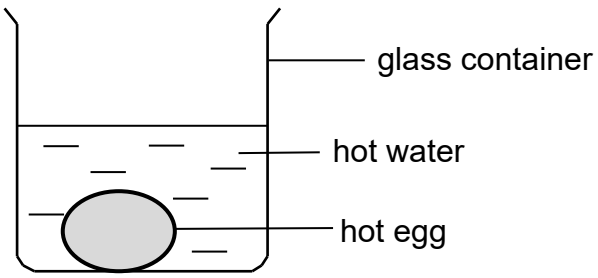
(1)



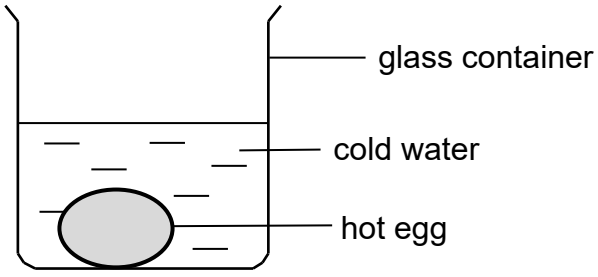
(2)



(3)

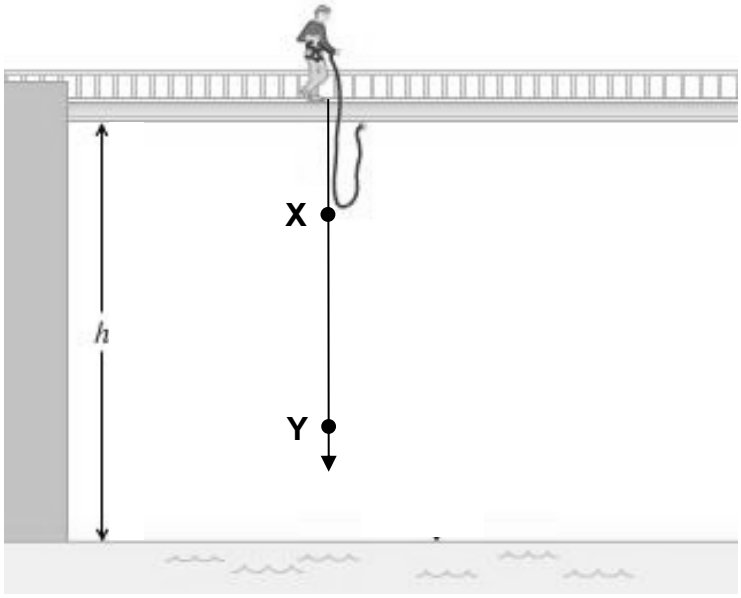


(4)



( )

24. The diagram below shows a person preparing to bungee jump from a bridge.

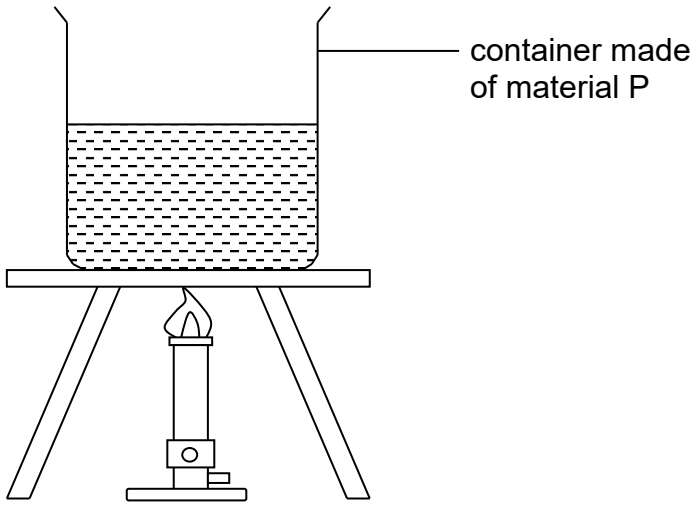


Compare the potential energy and kinetic energy of the person at points X and Y, which one of the following is correct?

	potential energy at X compared to Y	**kinetic energy at Y compared to X**
(1)	more	less
(2)	more	more
(3)	less	less
(4)	less	more

( )

25. Min Jun wanted to find out how well the three materials, P, Q and R conduct heat. He poured water into the three similar containers made of the different materials.



He recorded the time taken for the water to boil in the table below.

Material	**Amount of water (*ml*)**	**Time taken for water to start boiling (min)**
P	300	10
Q	100	10
R	200	10

Which of the following shows how well the three materials conduct heat?

	P	**Q**	**R**
(1)	poor	very good	good
(2)	very good	poor	good
(3)	poor	good	very good
(4)	very good	good	poor

( )

26. Wei Ming raised the end of a piece of wood as shown in Figure 1 but the block did not slide down. When he raised higher, the block started to slide down as shown in Figure 2.

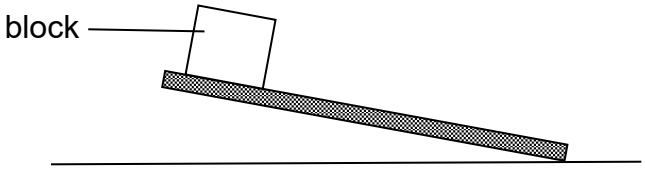


Figure 1

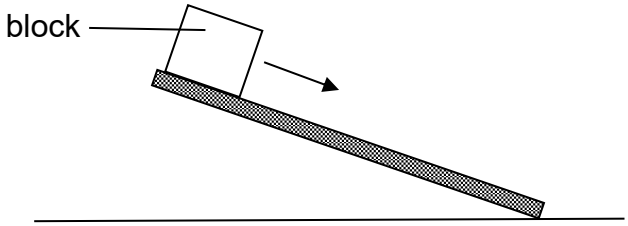


Figure 2

Which of the following statements are true?

A There is no frictional force acting on the block in Figure 1.

B There is gravity acting on the block in Figures 1 and 2.

C The frictional force acted on the block is greater than gravity in Figure 1.

D The frictional force acted on the block is lesser than gravity in Figure 2.

(1) A and B

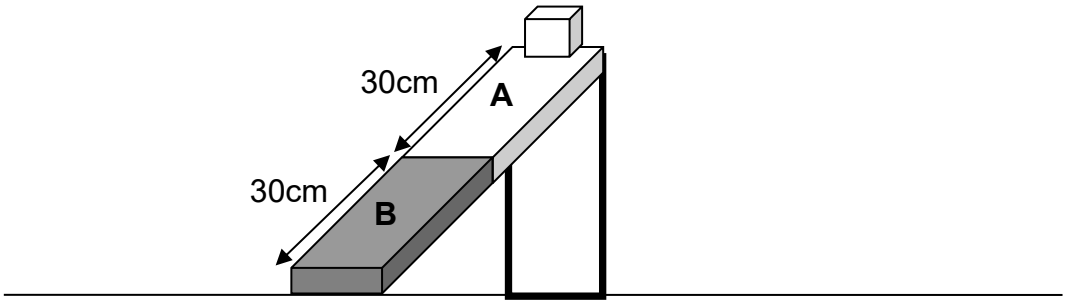
(2) B and C

(3) B, C and D

(4) A, C and D

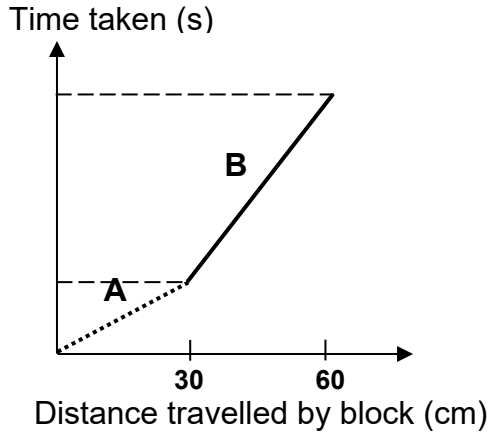
( )

27. Aziz wanted to find out the time taken for a wooden block to slide down two different surfaces, A and B using the set-up below. Surface A is smoother than surface B.

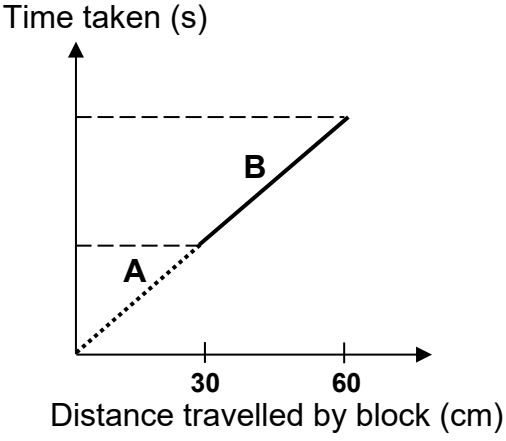


He measured the time taken for the wooden block to slide down the two surfaces. Which of the following graphs likely shows the results?

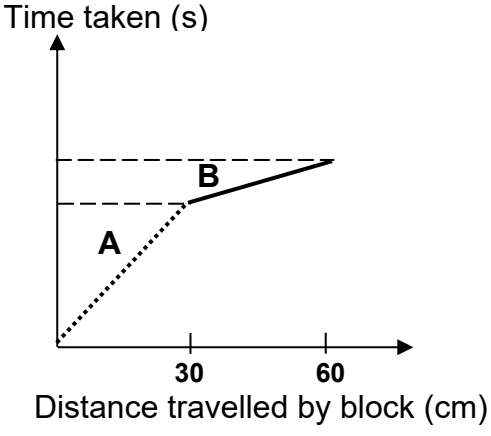
(1)



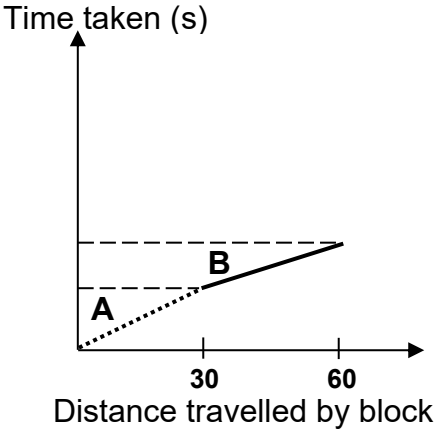
(2)



(3)

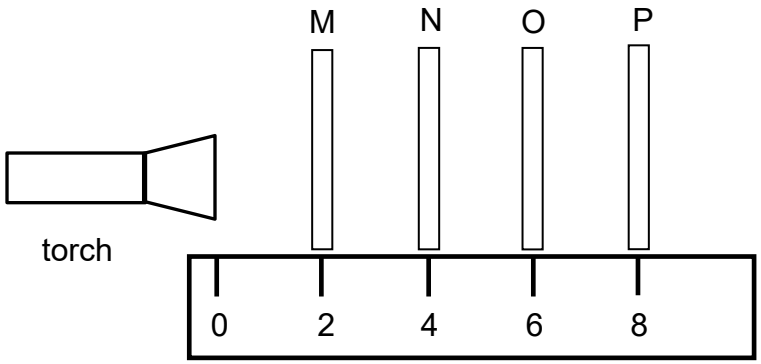


(4)



( )

28. Selvi carried out an experiment using materials M, N, O and P. She placed them on the 2 cm, 4 cm, 6 cm and 8 cm mark respectively. She shone a torch on the materials as shown below.



She measured the distance the light travels. She repeated the experiment by re-arranging the positions of the materials and recorded the results below.

Order of material	**Distance light travels (cm)**
M, N, O and P	2
O, N, M and P	6

Which of the following correctly describes the materials M, N, O, P?

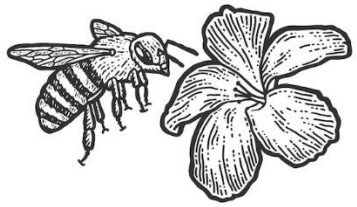
	Does it allow light to pass through?			
	M	**N**	**O**	**P**
(1)	no	no	yes	not sure
(2)	not sure	yes	no	yes
(3)	no	not sure	yes	no
(4)	no	yes	yes	not sure

( )

SECTION B: (44 MARKS)

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

29. Flower A is brightly-coloured and sweet-smelling. They are pollinated by Insect B.



(a) Describe the process of (i) pollination and (ii) fertilisation. [2]

(i) _____

_____

(ii) _____

_____

(b) The following shows a food chain.

plant A → insect B → spider

There was a sudden increase in the population of spiders.

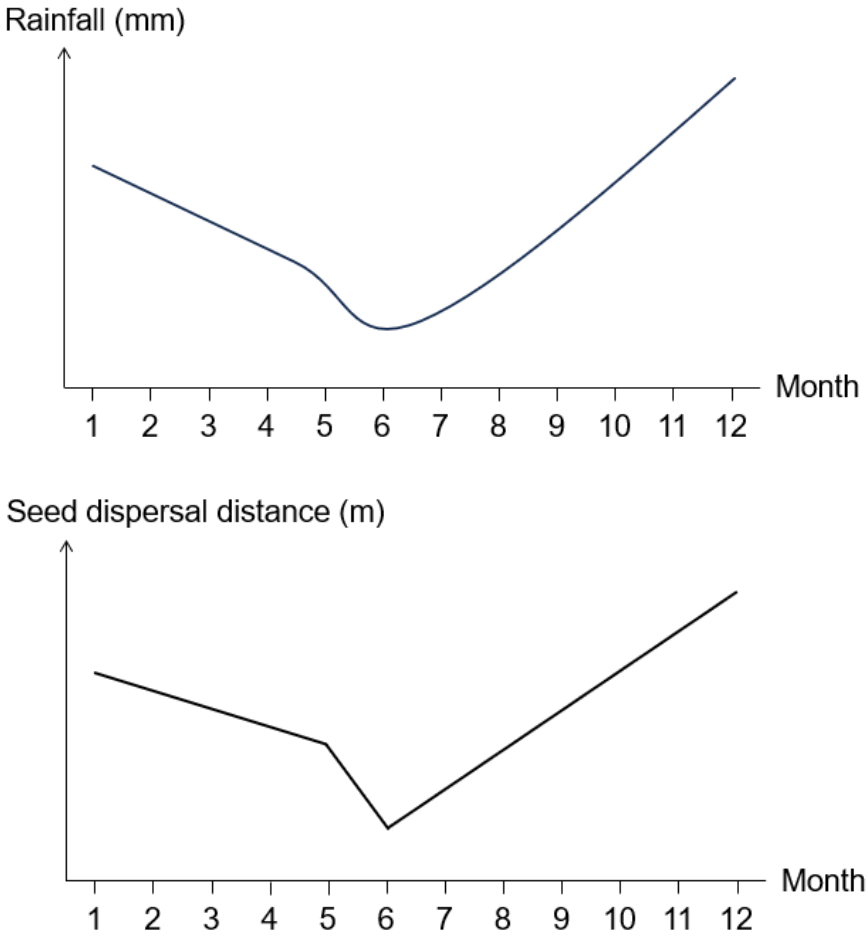
Predict how the population of plant A will be affected. Explain. [2]

_____

_____

_____

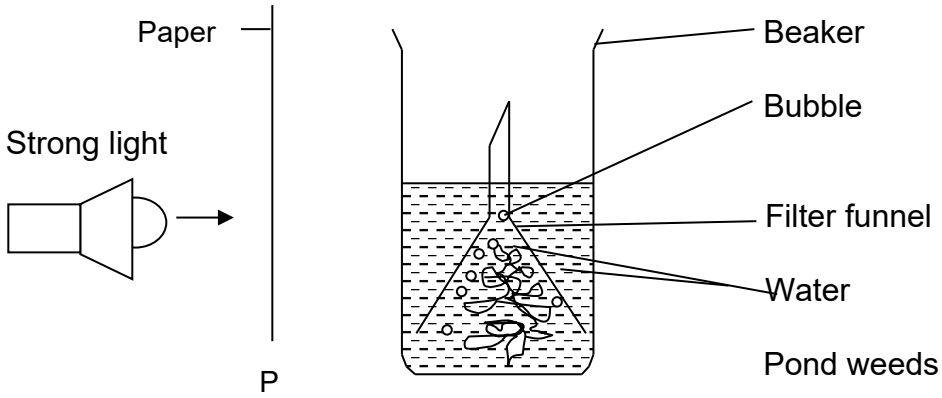
30. The monthly rainfall in a forest and the monthly seed dispersal distance of seed X are recorded in the graphs as shown below.



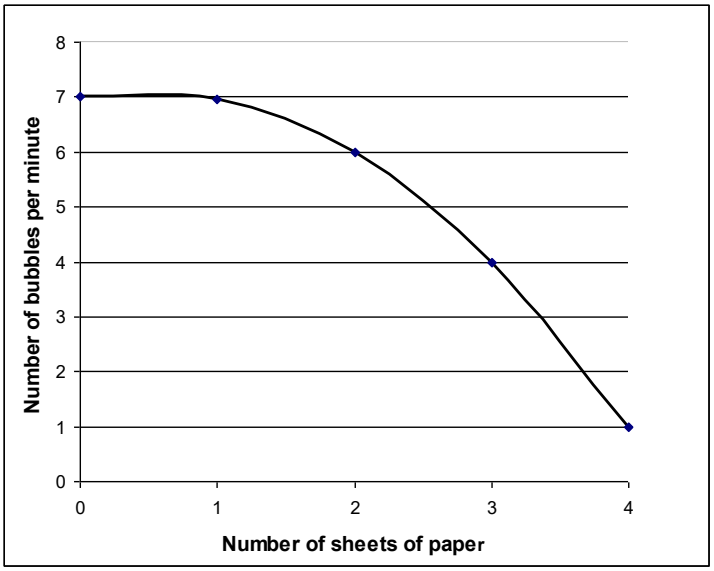
(a) Describe the relationship between the monthly rainfall and the seed dispersal distance of seed X. [2]

(b) State **two** structural features seed X is likely to have for this method of dispersal. [2]

31. Mohan set up an experiment with some pond weeds as shown in the diagram below. He counted the number of gas bubbles given out by the pond weeds in one minute. Then, a very thin sheet of paper was placed at position P and the experiment was repeated. The experiment was repeated another 3 times. One more sheet of the thin paper was added at P each time.



The results of the experiment were recorded as shown in the graph below.

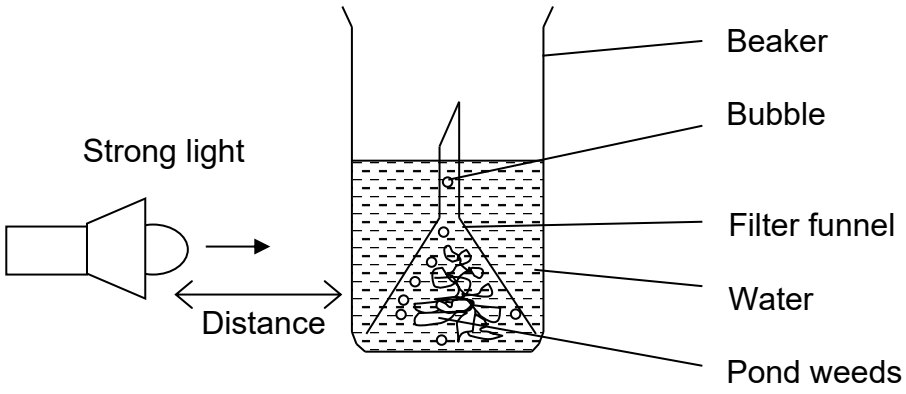


(a) Why did Mohan increase the number of sheets of paper at P? [1]

_____

_____

Abby conducted similar experiment as shown in the diagram below. However, she did not use any paper.



She measured the distance of the light source from the beaker and the number of gas bubbles given out by the plant in one minute. She took 3 readings every time the distance of the light source from the beaker was changed and calculated the average. The results are as shown in the table below.

Distance of the light source from the beaker (cm)	5	10	15	20	25
Average number of bubbles in 1 minute	30	20	10	6	3

(b) Why did Abby and Mohan take 3 readings for each experiment? [1]

_____

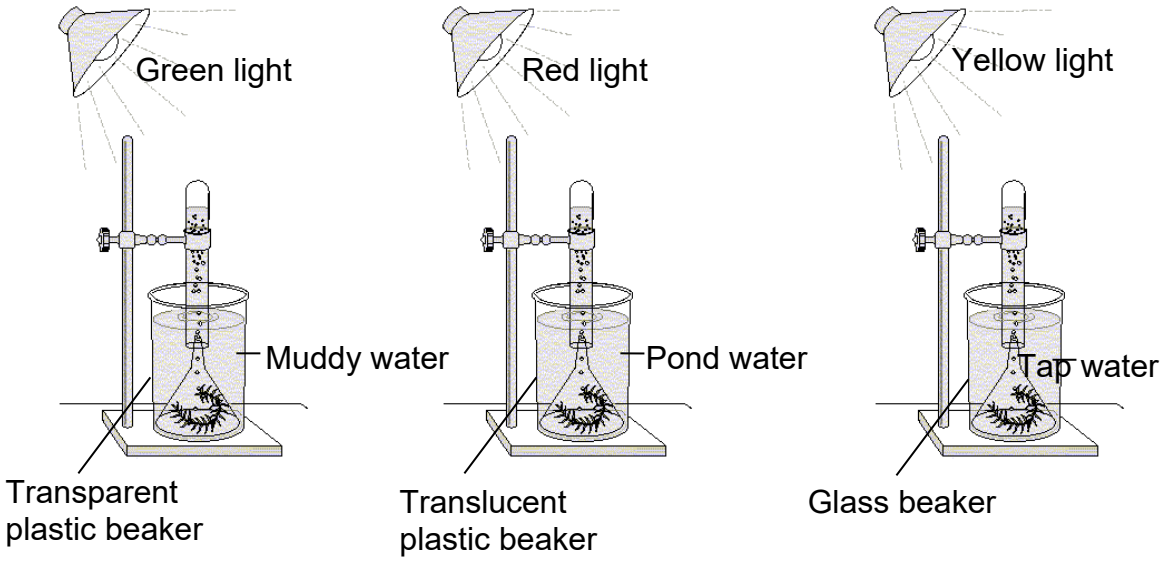
_____

(c) What conclusion could they make based on the results above? [1]

_____

_____

32. Ahmad carried out the experiment as shown in the diagram below. He wanted to find out if the colour of light would affect the rate of photosynthesis in plants.



(a) Ahmad's teacher said that his experiment was not fair. Suggest two changes he must make so that his experiment would be fair. [2]

Change 1: _____

_____

Change 2: _____

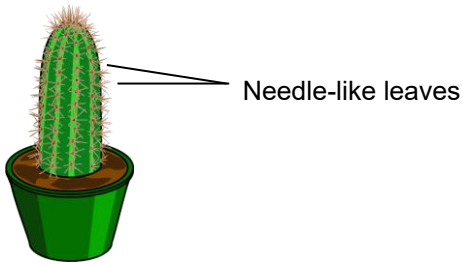
_____

(b) Ahmad observed that the plant in Set-up A died after two days even though he used a transparent plastic beaker. Give a reason for his observation. [1]

_____

_____

33. Mr Syahid brought a pot of cactus to his Science class. The pupils were told to discuss the adaptive features of the cactus.



Four boys commented on the needle-like leaves of a cactus.

Danish : They allow the plant to carry out photosynthesis all day.
Ahmed : They allow the plant to reproduce faster.
Mazlan : They protect the plants from animals living in the desert.
Johan : They reduce the rate of water loss by the plant.

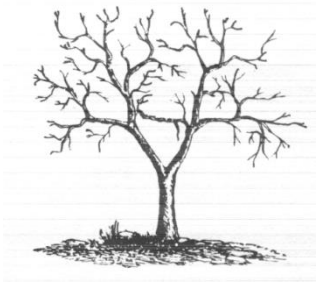
(a) Which of the pupils were correct? Give your reason(s). [2]

_____

_____

_____

(b) Some trees drop their leaves when the temperature gets too low.



How does the dropping of the leaves help the plant to adapt to the extreme cold temperature? [1]

_____

_____

34. Shane put 5 identical rubber fruits under different temperatures to find out the effect of temperature on the splitting of the rubber fruit. The results are recorded in the table below.

Fruit	Temperature (ºC)	Time taken for fruit to split (hr)	Distance the seeds are scattered (m)
A	15	Did not split	--
B	25	30	0.5
C	30	24	1
D	36	2	2.5
E	40	1	4

(a) Which fruit split with the greatest force? Why do you say so? [1]

_____

_____

(b) How far will the seeds be scattered if he subjected it to a temperature of 38 ºC? [1]

_____

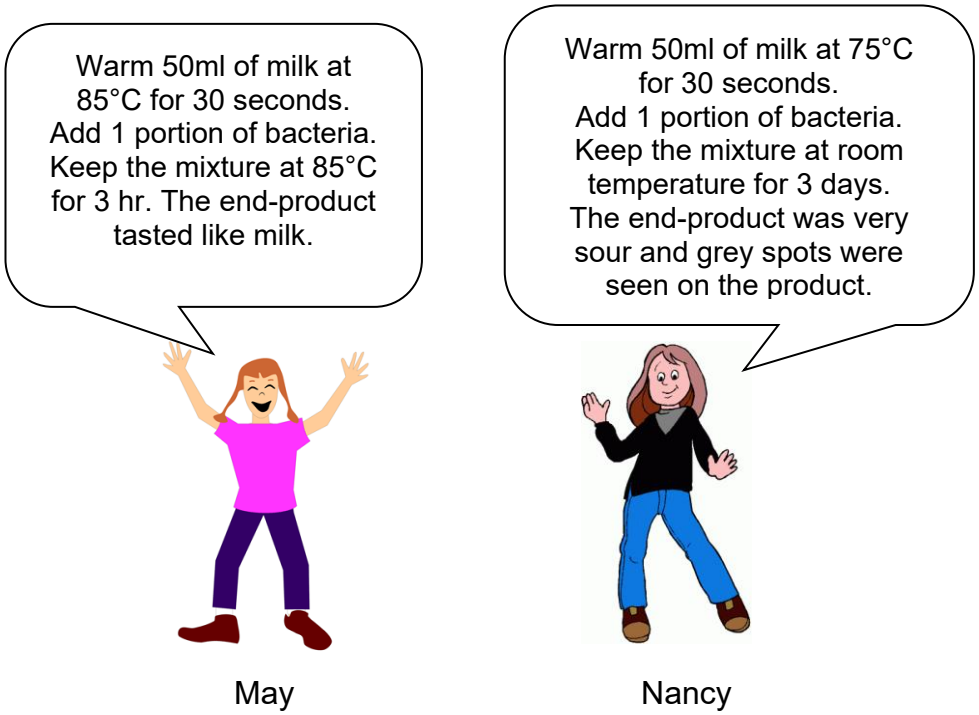
_____

(c) What conclusion can Shane draw from his results? [1]

_____

_____

35. May and Nancy were trying to make yoghurt for their Science project using some milk and bacteria.



(a) Explain why the bacteria in May's milk were not effective. [1]

_____

_____

(b) Which group of living things do the grey spots that appeared in Nancy's end-product belong to? [1]

_____

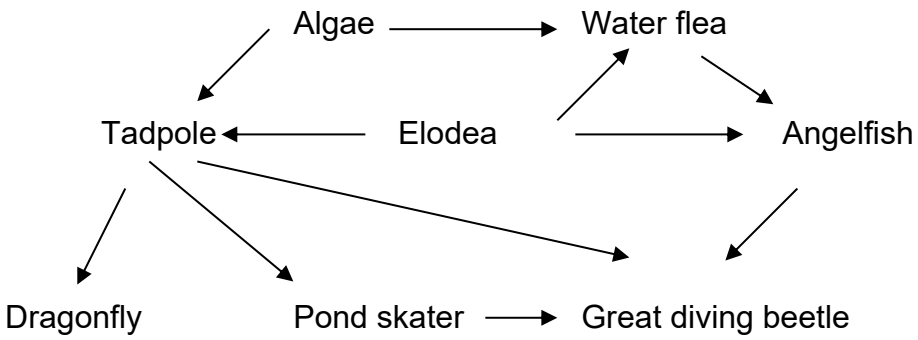
_____

(c) Explain why there were grey spots on Nancy's end-product. [1]

_____

_____

36. Look at the food web shown below.



(a) Which of the animal(s) in the food web is/are omnivore(s)? [1]

_____

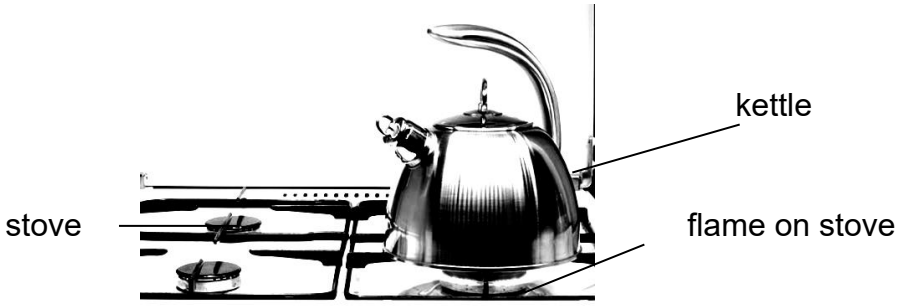
_____

(b) Name the animals which are <u>both</u> prey as well as predator. [2]

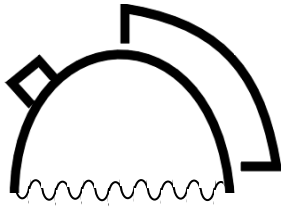
_____

_____

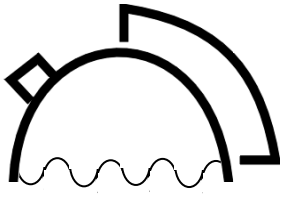
37. (a) Alice wanted to buy a non-electric kettle for stove top use as shown in the diagram below.



The salesperson told her that she should buy Kettle A instead of Kettle B as Kettle A allows water to boil more quickly.



Kettle A



Kettle B

Explain the reason behind the salesperson's statement. [2]

_____

_____

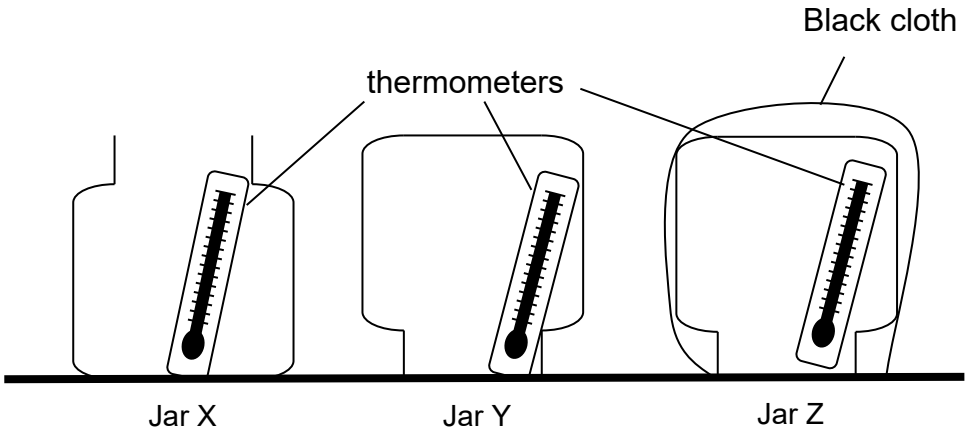
(b) The animal shown below is a desert lizard. It's long limbs keep the body away from the ground.

The desert lizard is able to move around in the desert even though the temperature of the ground is very high. Explain. [2]

_____

_____

38. Elijah placed three identical glass jars, X, Y and Z at the school garden at noon for 60 minutes. Jar X was upright but Jar Y and Jar Z were inverted. Jar Z was wrapped with a piece of black cloth. A thermometer was placed inside each jar as shown in the diagram below.



He measured the temperature of the air in the jars and the results are as shown in the table below.

Time (min)	Temperature (°C) of air in Jar X	Temperature (°C) of air in Jar Y	Temperature (°C) of air in Jar Z
0	29	29	29
30	32	33	?
60	33	36	?

(a) Why was it necessary for the three jars to have the same temperature at the beginning of the experiment? [1]

_____

_____

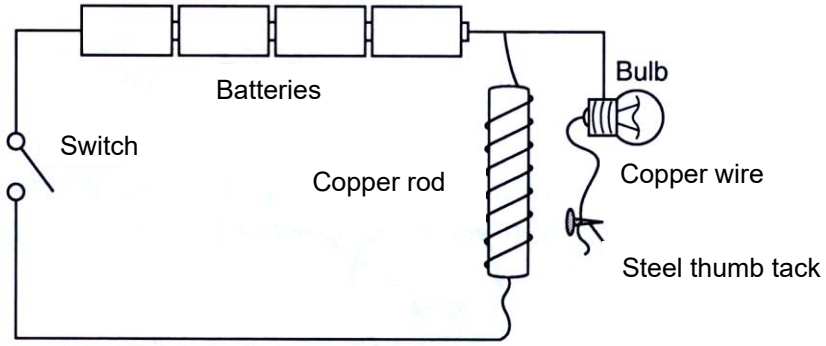
(b) Would the temperature of the air in the jar Z be higher, lower or the same a as Jar Y. Explain [2]

_____

_____

_____

39. Syafiqah set up the electrical circuit as shown in the diagram below.



(a) She observed that the bulb did not light up when she closed the switch. Explain why it was so. [1]

_____

_____

(b) She made some changes to the circuit and the bulb lighted up. Give two suggestions how she could increase the strength of the electromagnet. [2]

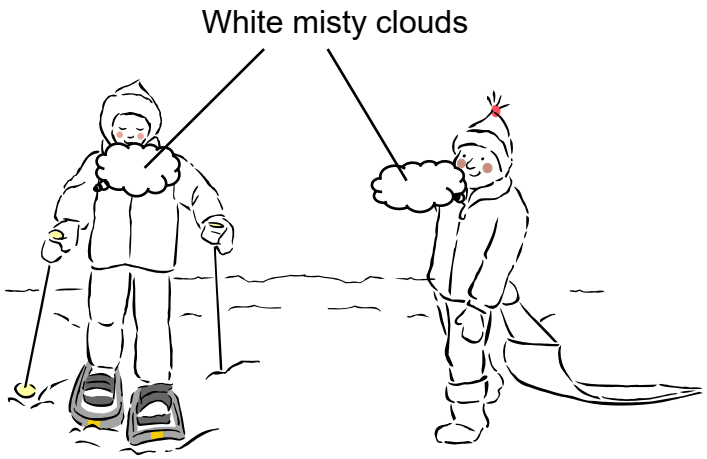
(i) _____

_____

(ii) _____

_____

40. Firdaus and Michael went to Australia during winter. While they were enjoying themselves playing in the snow, they noticed white misty clouds appearing in front of them when they were talking to each other.



(a) Explain how the white misty clouds were formed. [2]

_____

_____

_____

(b) Name the state of matter of the misty clouds. [1]

_____

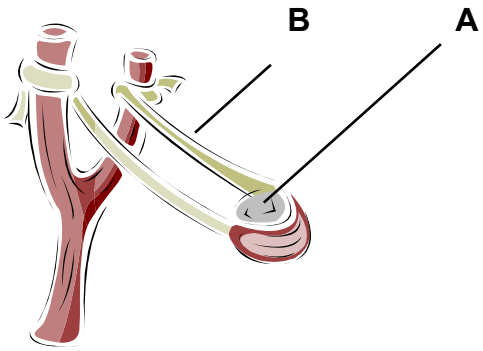
_____

(c) When they came back to Singapore, they did not experience the misty cloud when they spoke. Explain why. [1]

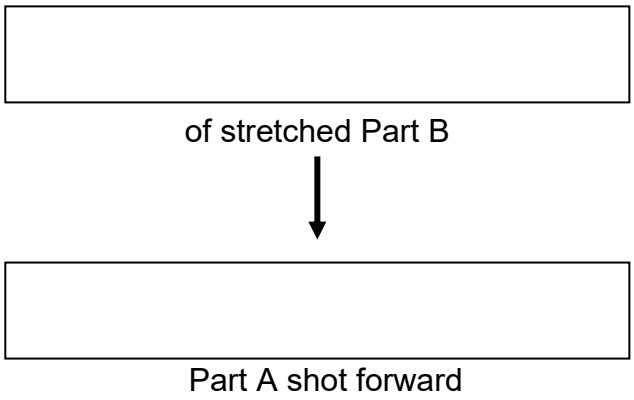
_____

_____

41. Danish had just bought a catapult as shown in the diagram below. Part B was made of rubber. When he pulled and released part B, object A would shoot forward.



(a) Write down the main energy changes which enables A to move forward. [1]



(b) State the force that made object A fall to the ground. [1]

_____

_____

(c) State two factors that would affect the distance moved by object A. [2]

(i) _____

_____

(ii) _____

_____