RAFFLES GIRLS' PRIMARY SCHOOL
PRELIMINARY EXAMINATION
PRIMARY SIX
2024

SCIENCE
(BOOKLET A)

Name: _____ ( ) **Date : 21 August 2024**

Class: P6 _____ **Total Time: 1h 45min**

INSTRUCTIONS TO CANDIDATES

1. **Write your name, class and index number in the spaces provided above.**
2. **Do not turn over this page until you are told to do so.**
3. **Follow all instructions carefully.**
4. **Answer all questions.**
5. **For Question 1- 28, use 2B pencil to shade your answers on the Optical Answer Sheet (OAS).**

Booklet A	/56
Booklet B	/44
Your score out of 100	
Parent's signature	

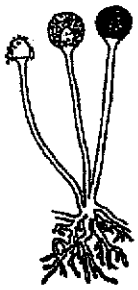
1. The table shows some characteristics of four animals. A tick (✓) represents the presence of the characteristic.

Animal	Characteristic			
	Have scales	Lays eggs	Have wings	Have hair
A	✓	✓		
B		✓		
C		✓	✓	
D			✓	✓

Based on the information above, which animal is most likely a mammal?

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

2. The diagram shows how some organisms (not drawn to scale) are grouped.

Group E	Group F
 Bread mould	 Tree fern
 Mushroom	 Lily plant

Which of the following statement(s) about the two groups of organisms is/are correct?

A The organisms in groups E and F are flowering plants.

B The organisms in group F contains chlorophyll but not those in group E.

C The organisms in group E reproduced by spores but those in group F reproduced by seeds.

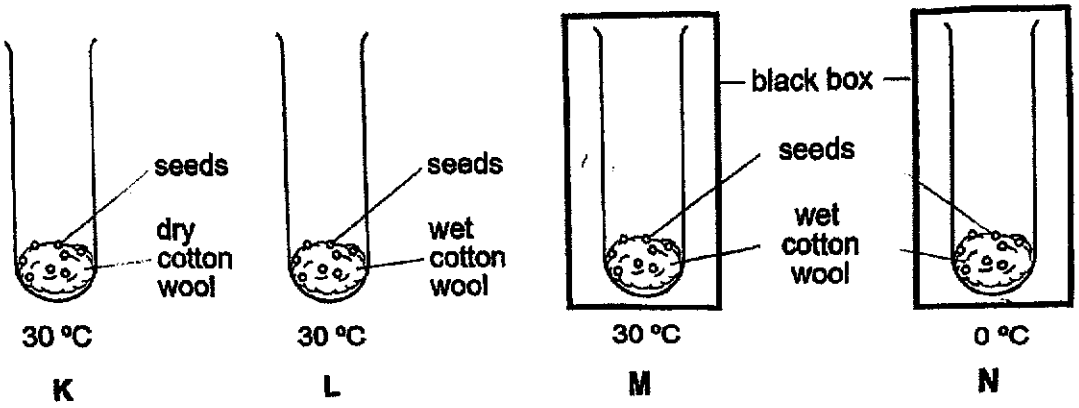
(1) B only

(2) C only

(3) A and B only

(4) B and C only

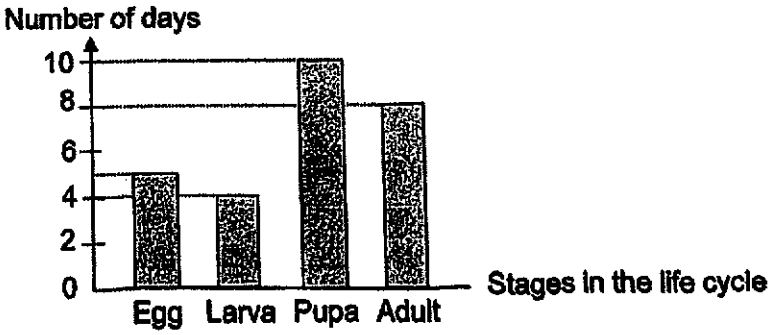
3. Identical number of seeds of the same type were placed in four set-ups, K, L, M and N. The seeds were exposed to different conditions as shown in the diagrams.



In which set-up(s) will the seeds most likely germinate after a week?

(1) M only
(2) K and L only
(3) L and M only
(4) L, M and N only

4. The graph shows the duration of each stage of the life cycle of an organism.



Using the information from the graph above, at which stage of development will the organism be on the 6th day after it has hatched?

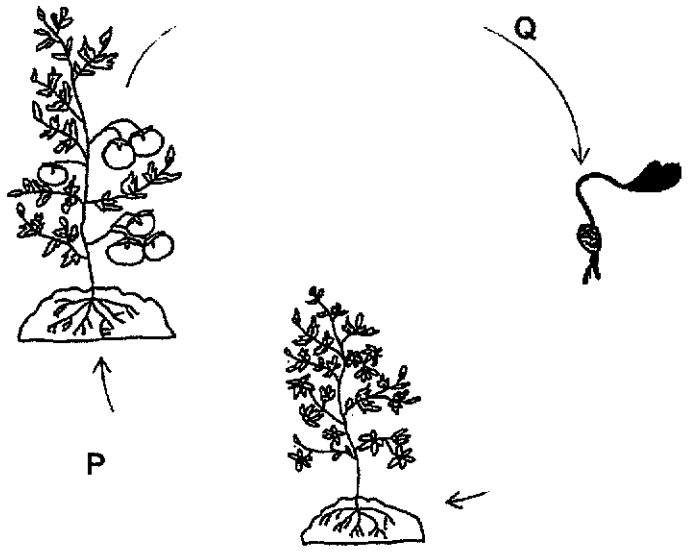
(1) Egg
(2) Larva
(3) Pupa
(4) Adult

5. Which of the following traits are inherited?

A Hair length
B Eye colour
C Tongue rolling
D Shape of earlobes

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

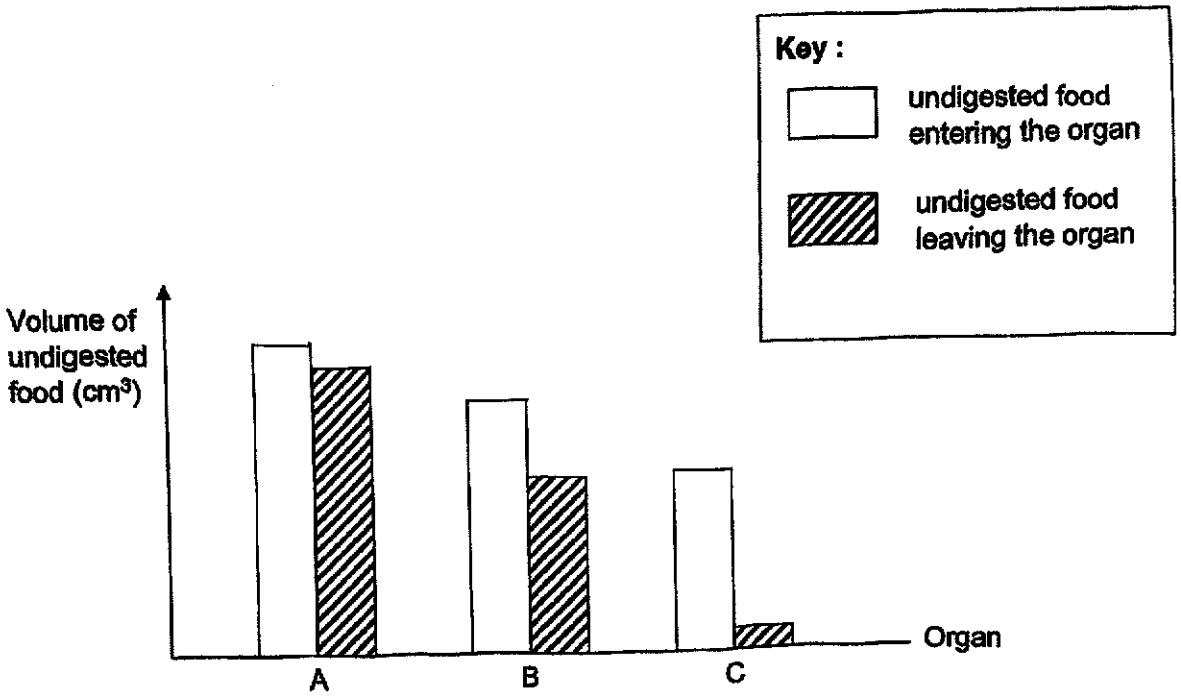
6. The diagram below shows the changes in the development of a plant.



Which of the following shows the correct process(es) that occurred at P and Q?

	Process(es) at P	Process(es) at Q
(1)	Germination only	Dispersal only
(2)	Pollination only	Germination only
(3)	Dispersal and pollination	Pollination and fertilisation
(4)	Pollination and fertilisation	Dispersal and germination

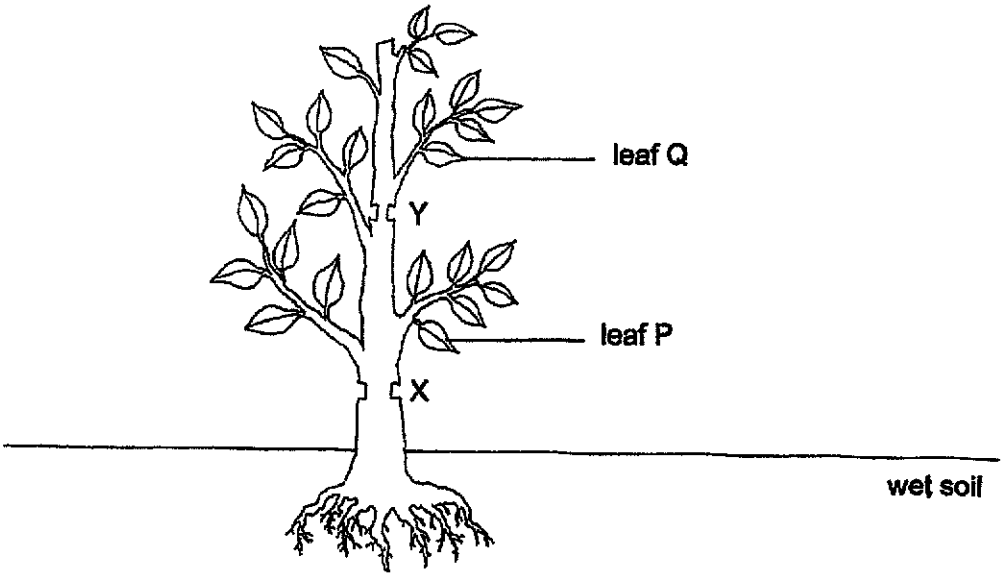
7. The graph shows the volume of undigested food in organs, A, B and C in a human digestive system.



Based on the information above, which of the following statements is correct?

(1) No digestion occurred in organ C.
(2) Most food was digested in organ A.
(3) All the organs, A, B and C, release digestive juices.
(4) More digested food was absorbed in organ A than in organ B.

8. Amanda cut away the outer rings of a plant at parts X and Y as shown.

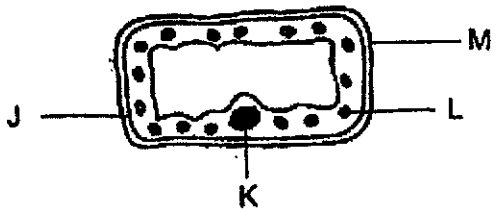


She placed the plant under well-lit condition and watered it daily. After a few days, she noticed that leaf Q withered while leaf P survived.

Which of the following shows the tube(s) that has/have been removed at parts X and Y?

	Part X	Part Y
(1)	Water-carrying tubes	Food-carrying tubes
(2)	Food-carrying tubes	Food-carrying tubes and water-carrying tubes
(3)	Food-carrying tubes and water-carrying tubes	Water-carrying tubes
(4)	Water-carrying tubes	Food-carrying tubes and water-carrying tubes

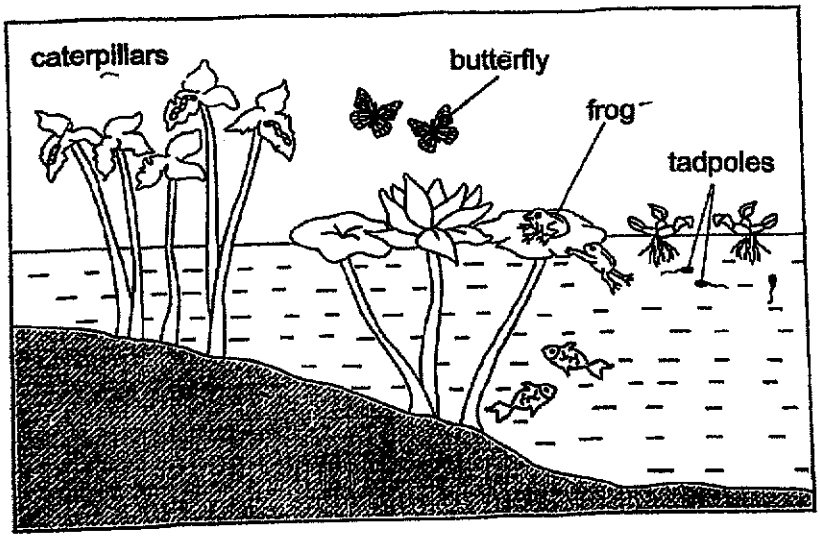
9. The diagram shows a cell with its parts labelled J, K, L and M.



Which of the following is correct?

	Part	Function
(1)	J	Gives the cell its shape
(2)	K	Allows substances to enter or leave the cell
(3)	L	Traps light energy
(4)	M	Contains genetic information

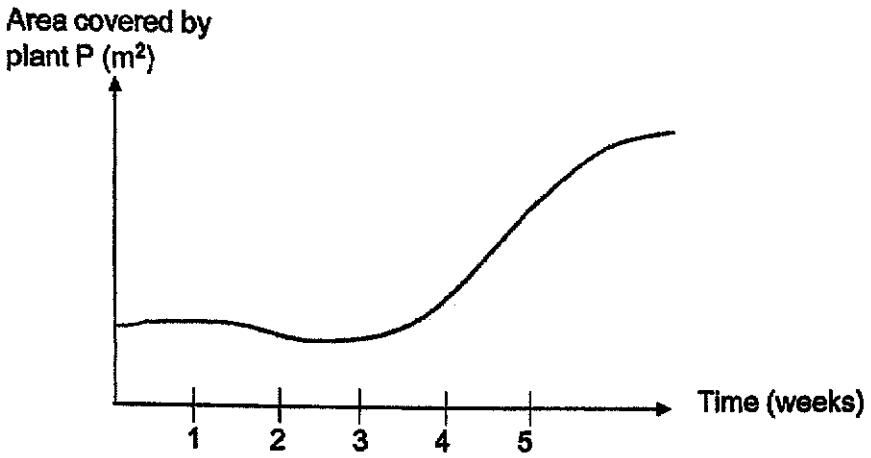
10. Study the diagram carefully.



Based on the information, which of the following statements is correct?

(1) There are three populations of animals.
(2) The tadpoles and the frogs form one community.
(3) The populations of plants are more than that of animals.
(4) Two populations of animals have adults that live on both land and water.

11. The graph shows the change in the area covered by plant P in a certain habitat.



Which of the following caused the change in the area covered by plant P from week 3 onwards?

(1) There was a fire in the habitat.
(2) There was no rainfall for four weeks in the habitat.
(3) Another population of plant was introduced into the habitat.
(4) Some animals that feed on plant P migrated to another habitat.

12. An experiment was carried out to observe the relationship amongst three types of organisms X, Y and Z. Organisms X and Y were placed in tank 1 and organisms Y and Z were placed in tank 2. They were given the same volume of water every day but no food.

After three days, the following observations were made:

	Populations		
Tank	**X**	**Y**	**Z**
1	Decreased	Increased	-
2	-	Decreased	Increased

Based on the information, which of the following food chains most likely shows the relationship among the organisms?

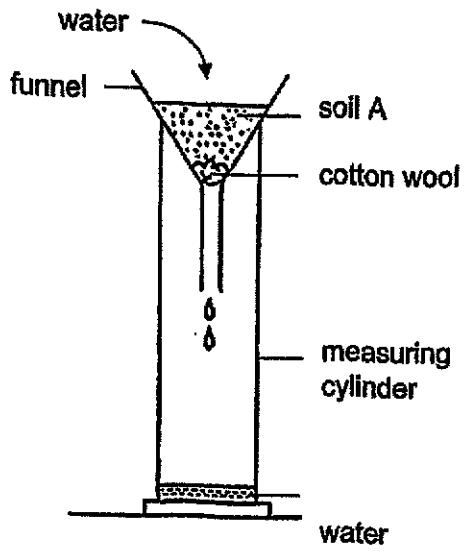
(1) X → Y → Z

(2) Y → Z → X

(3) Z → Y → X

(4) X → Z → Y

13. Rachel set up the experiment as shown to study three types of soil, A, B and C. She poured 100ml of water into a funnel containing soil A. She recorded the time taken for 20ml of water to be collected in the measuring cylinder. She repeated the experiment with equal amounts of soil B, followed by soil C.

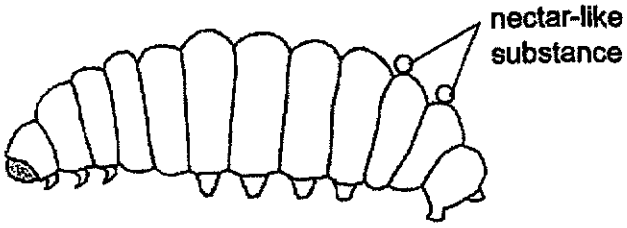


Type of soil	A	B	C
Time taken to collect 20ml of water (s)	20	120	75

Based on the information, which of the following statements is correct?

(1) Soil B retains more water than soil C.
(2) Soil B is made up of the largest soil particles.
(3) Soil C allows water to pass through faster than soil A.
(4) Soil A has the least amount of air spaces between the soil particles.

14. The diagram shows a type of caterpillar which releases nectar-like substance. This nectar-like substance is not only nutritious but can also tame fierce ants P. It moves slowly and only feeds on leaves.



Ants P taste bitter and are poisonous when eaten. They can be found swarming all over the caterpillar drinking the nectar-like substance. They do not feed on the caterpillar

Which of the following statements is correct?

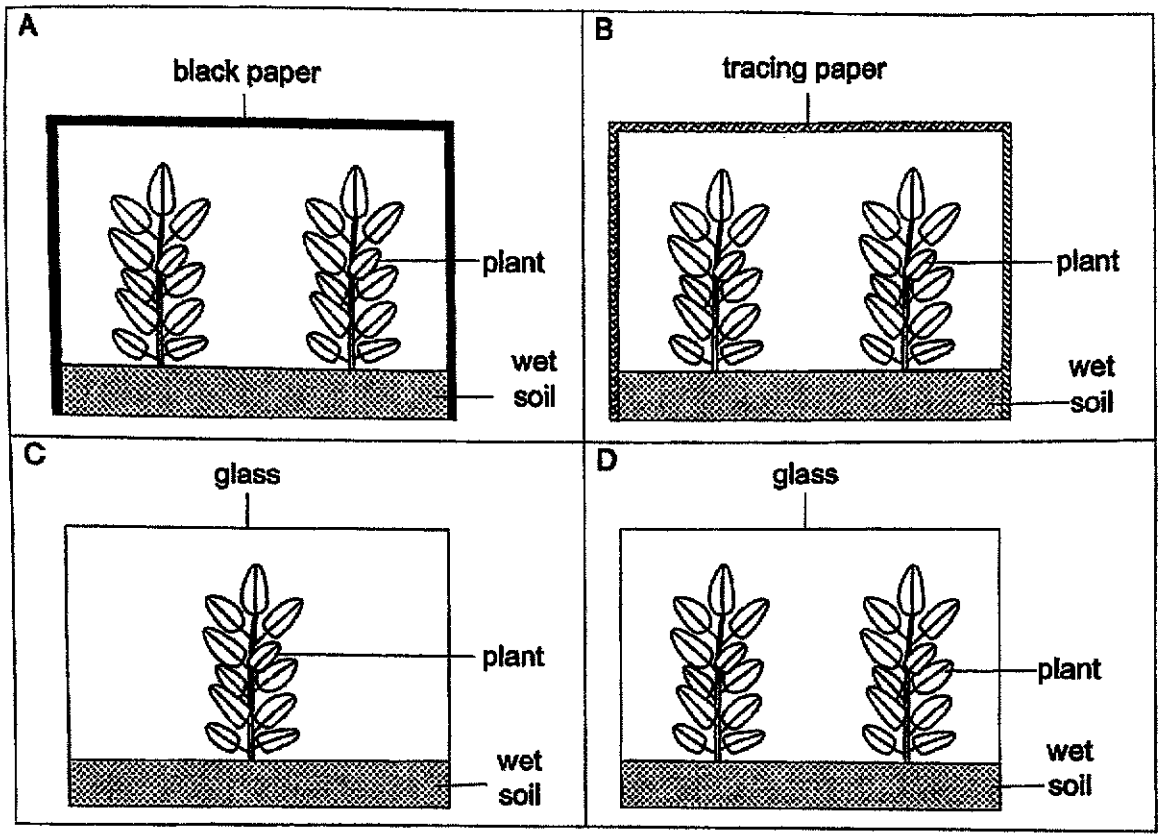
(1) The caterpillar moves slowly to attract mates.
(2) The nectar-like substance attracts the caterpillar's prey to feed on it.
(3) The caterpillar moves slowly to reduce the chance of being captured by predators.
(4) The nectar-like substance attracts ants P to cover the caterpillar's body to protect it from predators.

15. Which of the following statements about deforestation is/are correct?

A It can result in soil erosion.
B It can result in a drop in sea level.
C It can reduce rainfall in the deforested areas.
D It can lead to a decrease in greenhouse gases in the environment.

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

16. Yen Ning wanted to find out if the presence of light affects the growth of a plant.



Which of the following set-ups should she use to conduct her experiment?

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

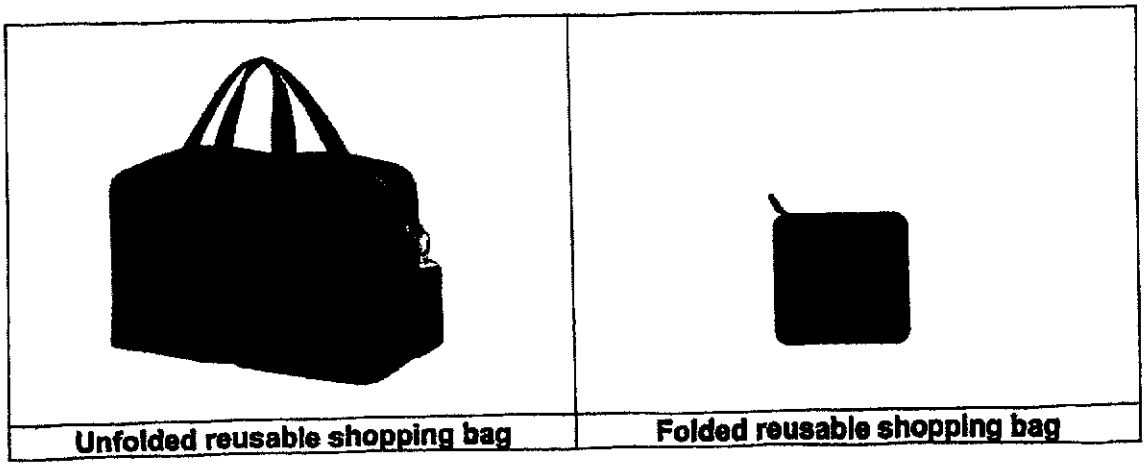
17. Which of the following is a test for flexibility of an object?

(1) Pulling on an object until it breaks
(2) Bending an object to see if it breaks
(3) Putting the object in water to see if it sinks
(4) Shining a light through the object to see how much light passes through it

18. Which of the following is not matter?

(1) Salt
(2) Cloud
(3) Bacteria
(4) Reflection

19. The diagram below shows a reusable bag when it is folded and unfolded.



Unfolded reusable shopping bag	Folded reusable shopping bag

Which of the following is true about the shopping bag?

A The shopping bag is flexible.
B The shopping bag occupies space.
C The shopping bag has the same mass when it is folded or unfolded.

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

20. Glenn lived in a very cold place. When he threw hot water from a container, it immediately turned into a white, powdery substance as shown in the diagram.

Based on the information, which of the following statements is true?

(1) Melting has taken place.

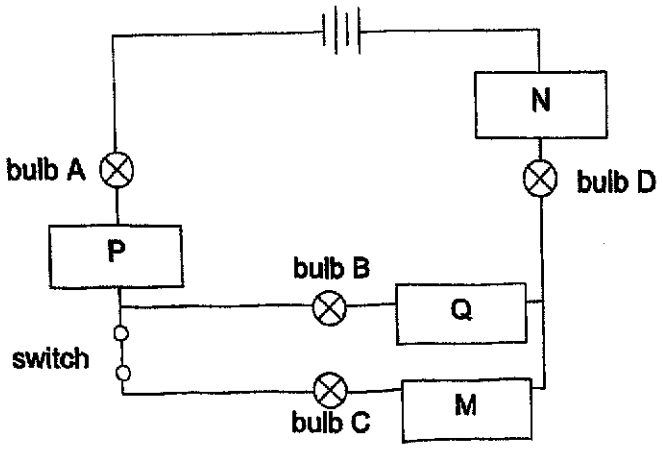
(2) There is a change of state of the hot water from liquid to gas.

(3) The hot water has condensed to become the white, powdery substance.

(4) The temperature of the surroundings is lower than the freezing point of water.

Study the circuit and answer questions 21 and 22.

Alice constructed a circuit as shown below using materials P, Q, M and N. All bulbs and batteries are in working condition.



21. When the switch was closed, she found that bulbs A, C and D lit up but bulb B did not light up.

Which of the following materials are conductors of electricity?

(1) M and P only
(2) M and Q only
(3) M, N and P only
(4) M, N and Q only

22. When the switch was closed and bulb C was fused, which of the following bulbs would not light up?

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

23. There were four bars, W, X, Y and Z placed on a table. There were an aluminium bar, an iron bar and two bar magnets.

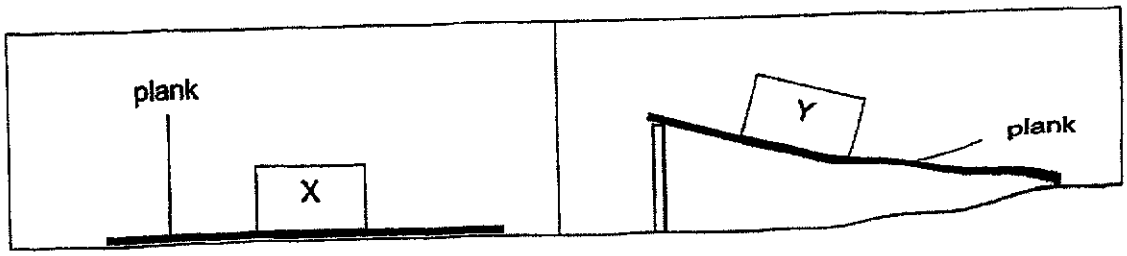
Quentin placed two bars at a fixed distance from each other and recorded the interactions between the bars.

Position of two bars		Interaction
W	X	Repulsion
W	Y	Attraction
X		No interaction

Which of the following is correct about bars W, X, Y and Z?

	W	X	Y	Z
(1)	Aluminium	Magnet	Magnet	Iron
(2)	Iron	Aluminium	Magnet	Magnet
(3)	Magnet	Iron	Aluminium	Magnet
(4)	Magnet	Magnet	Iron	Aluminium

24. Timothy placed two identical blocks, X and Y, on identical planks as shown. Both blocks X and Y have the same mass.



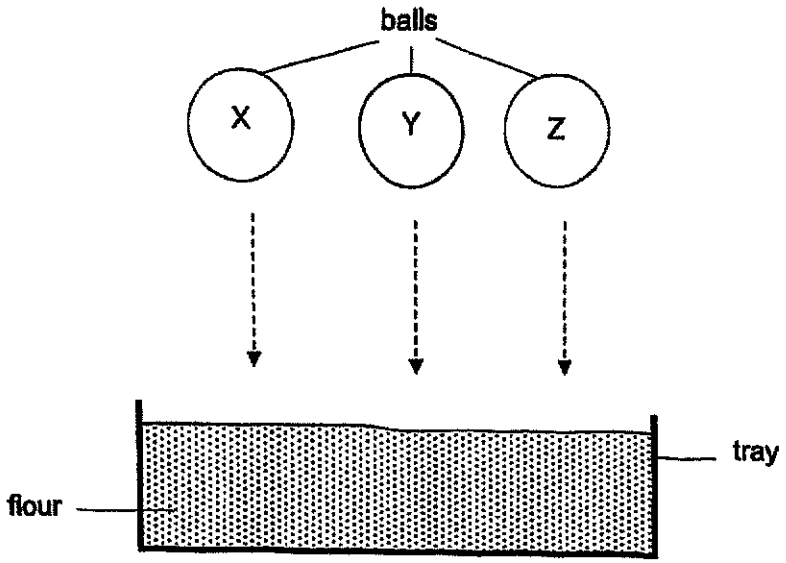
Timothy observed that both wooden blocks X and Y were stationary.

Based on the observations, which of the following statement(s) is/are true?

A Gravitational force was acting on block X only.
B Gravitational force was acting on blocks X and Y.
C There was frictional force between surfaces of block Y and the plank.

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

25. Vishnu dropped three balls, X, Y and Z, of the same size into a tray of flour from the same height as shown. All the balls have different masses.



He recorded the depth of the depression made by the balls in the tray of flour in the table.

	Depth of depression (cm)			
Ball	**1st try**	**2nd try**	**3rd try**	**Average**
X	3	3.5	3.5	3.3
Y	1	2	1.5	1.5
Z	4	3.5	4	3.8

Based on the results in the table above, which of the following statements is correct?

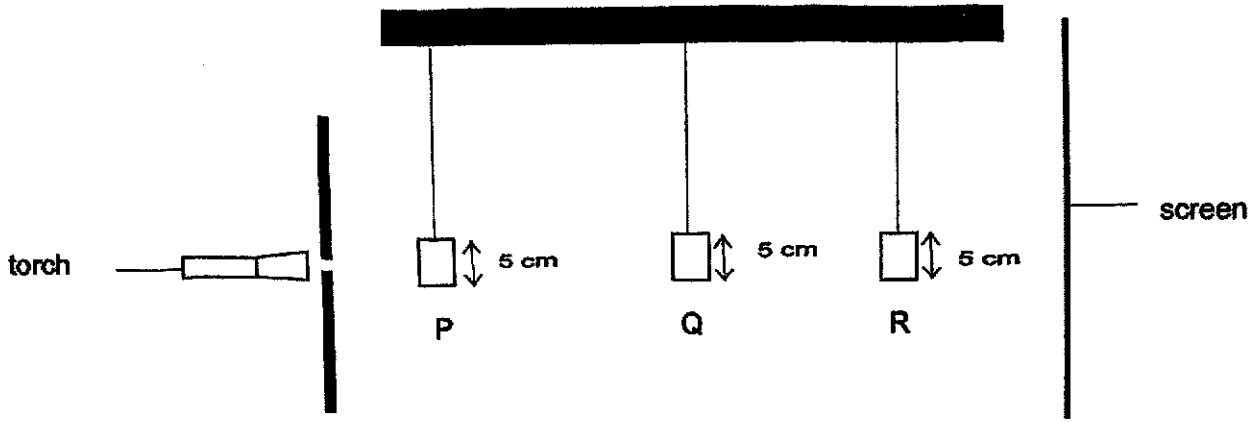
(1) Ball Z had the greatest mass.

(2) Ball Y had the most kinetic energy just before it hit the flour.

(3) The gravitational force acting on balls X, Y and Z at the initial height was the same.

(4) The gravitational potential energy of balls X, Y and Z at the initial height were the same.

26. The diagram shows a torch shining on three objects P, Q and R. Objects P, Q and R were different shapes made up of wood. They were placed at different distances from the torch.

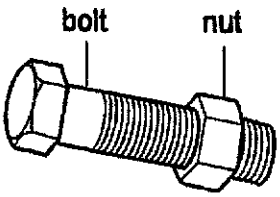


The diagram shows the shadow cast on the screen.

Which one of the following represents correctly objects P, Q and R respectively?

	P	Q	R
(1)	★	□	●
(2)	●	★	□
(3)	□	★	●
(4)	□	●	★

27. A carpenter is unable to remove a steel nut from a steel bolt because it was too tight.



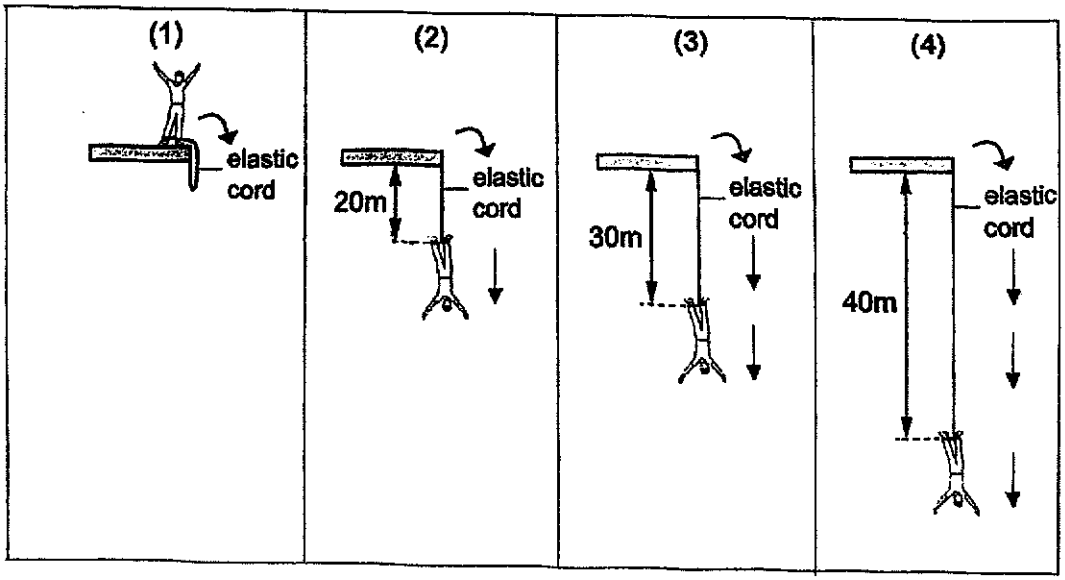
What should the carpenter do to remove the nut most easily from the bolt?

(1) Heat the nut only
(2) Heat the bolt only
(3) Cool the nut and heat the bolt
(4) Heat the nut and bolt to the same temperature at the same time

28. A man did a bungee jump from a platform. His legs were attached to an elastic cord. The length of the unstretched cord is 20m.

He jumped off the platform and fell downward to a distance of 40m and stopped momentarily before starting to rise upwards. The diagrams show four sequential stages of the bungee jump.

At which stage, 1, 2, 3 or 4, was both elastic potential energy and kinetic energy present?



RAFFLES GIRLS' PRIMARY SCHOOL
PRELIMINARY EXAMINATION
PRIMARY SIX
2024

SCIENCE
(BOOKLET B)

Name: _____( ) **Date : 21 August 2024**

INSTRUCTIONS TO CANDIDATES

1. Write your name, class and index number in the spaces provided above.
2. Do not turn over this page until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. For questions 29 – 41, write your answers clearly in the spaces provided.
6. The number of marks is shown in brackets[ ] at the end of each question or part question.

Score	/ 44

29. Annie found animal A as shown in the diagram.

Animal A

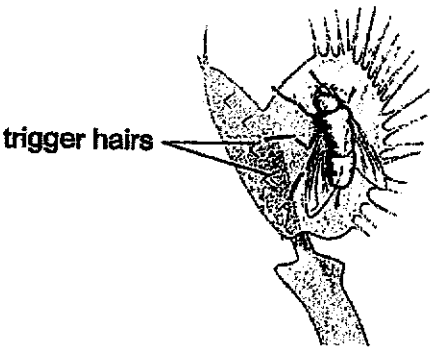
Her classmate told her that animal A is an insect.

(a) Based on your observation, do you agree with Annie's classmate? Give two reasons for your answer. [2]

_____

_____

Animal A lands on plant Y. When animal A touches the trigger hairs of plant Y, its leaves snap shut rapidly and trap animal A as shown in the diagram.



Animal A landing on plant Y

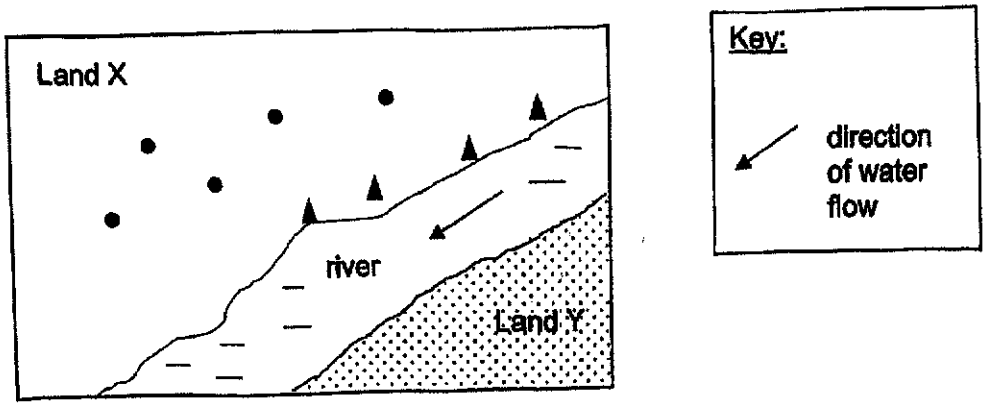
Leaves of plant Y snap shut

(b) State the characteristic of living things as shown by plant Y. [1]

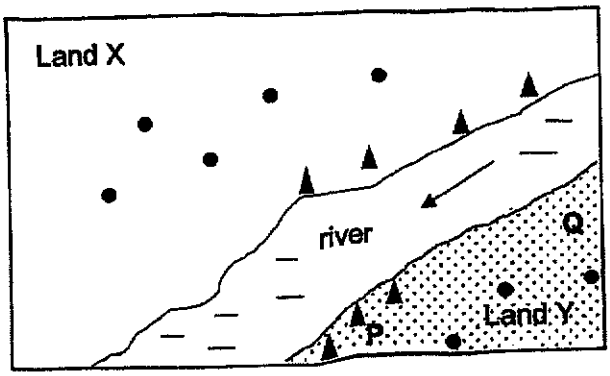
_____

Score	/3

30. Land X has some plants (● and ▲) and animals, but land Y does not have any plants or animals.



After a few months, plants were growing on land Y and several months later, animals were found on it.



(a) Based on the above observation, state two structural adaptations that allowed the fruit of plant ▲ to be dispersed. [2]

_____

(b) Give a reason why plant ▲ is found at part P and not at part Q of land Y. [1]

_____

_____

Score	3

Continue on page 23

Continued from page 22

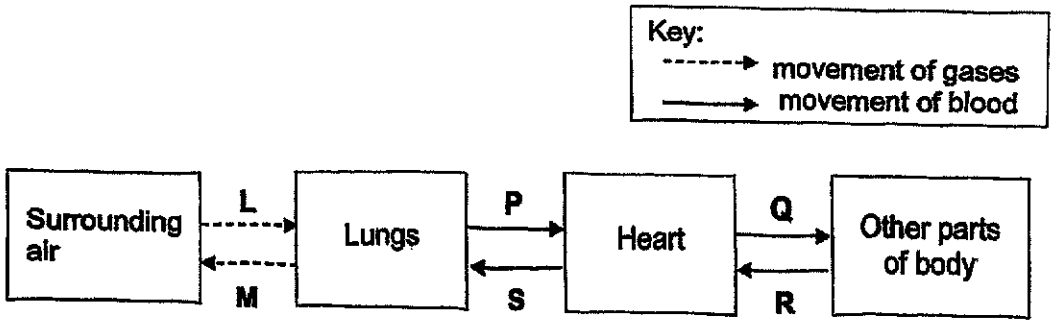
(c) Explain why animals could be found living on land Y after plants started growing there. [1]

_____

_____

_____

31. The diagram shows the movement of gases and blood in the respiratory and circulatory system of a body.



(a) Describe one difference between the amount of oxygen at L and M. [1]

_____

_____

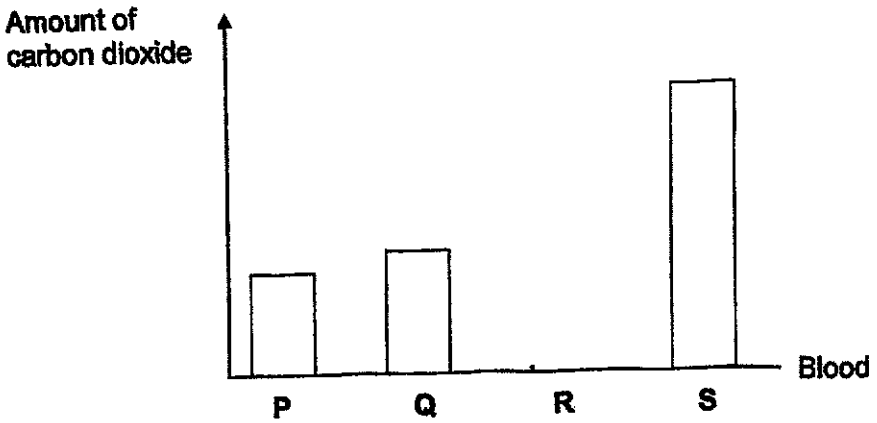
Continue on page 24

Score 2

Continued from page 23

(b) The bar graph shows the amount of carbon dioxide in the blood at P, Q and S.

Complete the bar graph to show the amount of carbon dioxide at R correctly. [1]



(c) Will the greatest amount of oxygen be found in the blood at P, Q, R or S? Explain your answer. [2]

_____

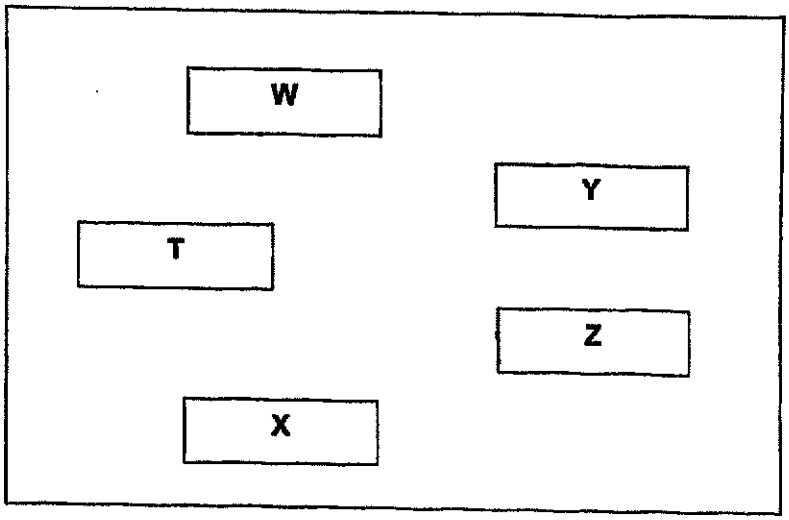
_____

Score 3

32. Some organisms, W, X, Y and Z, are found on plant T. The following are some information about organisms W, X, Y and Z and plant T.

Organism W feeds on the leaves of plant T.
Organism X feeds on the fruits of plant T.
Organism Y feeds on W.
Organism Z feeds on Y and the fruits of plant T.

(a) Using the above information, draw arrows to complete the food web correctly. [1]



(b) Explain why the herbivores that feed on plant T do not need to compete for food. [1]

_____

_____

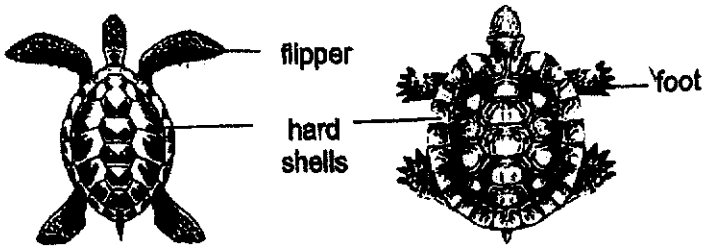
(c) Besides providing food and shelter, explain why plants are important to animals. [1]

_____

_____

Score 3

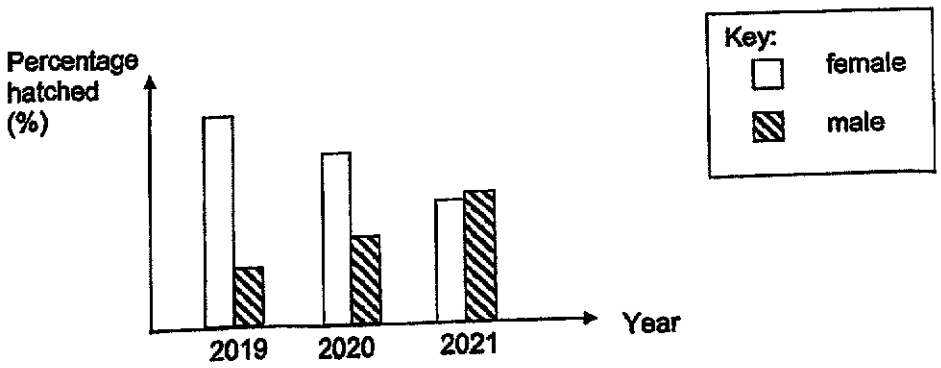
33. The diagrams show the top view of animals P and Q. Both animals have a hard shell.



Animal P Animal Q

(a) Based on your observation, which animal, P or Q, survives better in water? Explain your choice. [2].

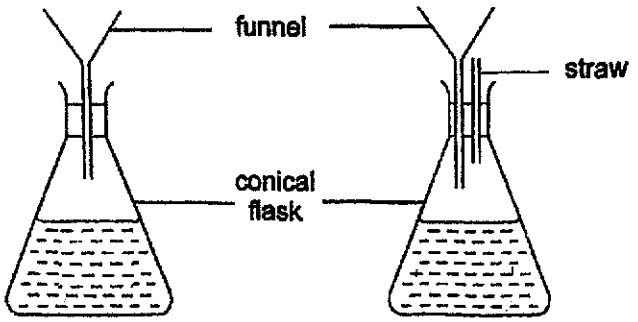
The graph shows the percentage of males and females hatched from the eggs of a species of turtle in a particular habitat over a period of time. The temperature in this habitat increased gradually over this period of time.



(b) Based on the information above, give a reason why this species of turtle may disappear from the Earth due to global warming in the future. [1]

Score 3

34. Jake poured the same amount of water into two identical conical flasks through the funnels in two set-ups, A and B. Set-up B has an additional straw placed beside the funnel as shown. He observed that time taken for all the water in the funnel to flow into the flasks is different.



Set-up A **Set-up B**

(a) He recorded the results of his experiment as shown.

Fill in the correct letter, A or B, into the blanks below, to represent the time taken for water to be emptied into the flask in each set-up. [1]

Set-up	Time taken for all the water to flow into the flask (s)
(i) _____	30
(ii) _____	300

(b) Explain your answer for (a)(ii). [2]

_____

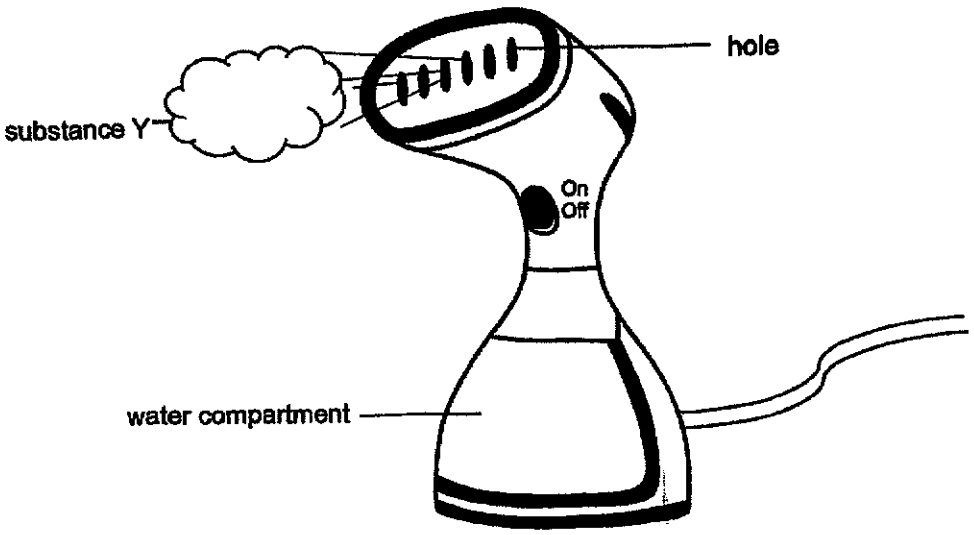
_____

Score	/ 3

35. Julie used a device, as shown in the diagram, to iron out the creases on her clothes.

First, she poured water into the water compartment in the device. When the device was switched on, the water was heated to 100°C by the heating elements in the device.

Then substance Y was observed just outside the holes as shown.



(a) Identify substance Y and explain how substance Y was formed. [2]

(b) Julie used the same device in another room with a lower room temperature. She observed more substance Y was formed.
Explain her observation. [1]

_____

_____

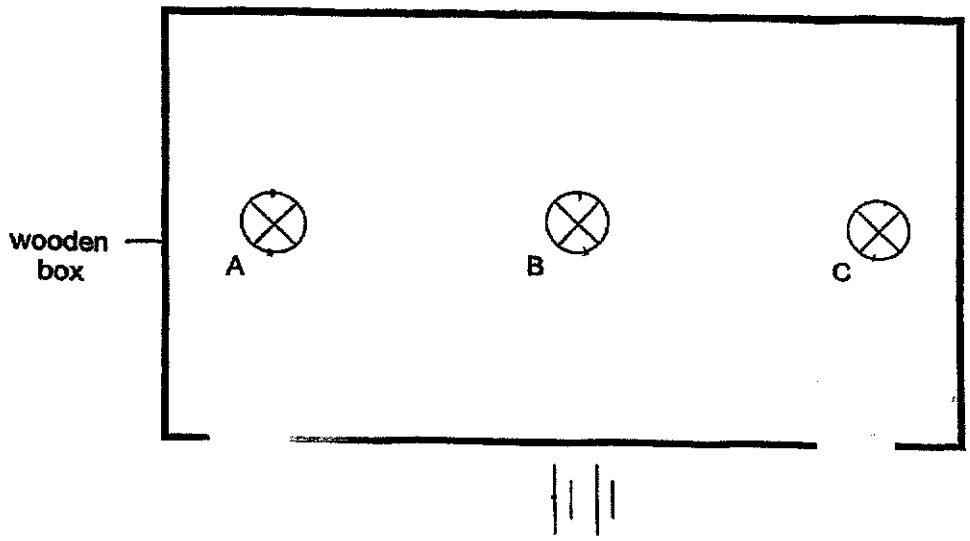
Score	3

36. Wendy set up a circuit using wires, a switch and bulbs A, B and C. She placed the circuit within a wooden box as shown. When the switch was closed, all the bulbs lit up. Wendy removed one light bulb from the circuit, one at a time, and observed what happened to the other light bulbs.

She recorded her observations in the result table below.

Bulb removed	Bulbs that lit up
A	None
B	A and C
C	A and B

(a) Based on the information above, complete the circuit to show how the three light bulbs and the switch were connected in the circuit. [2]



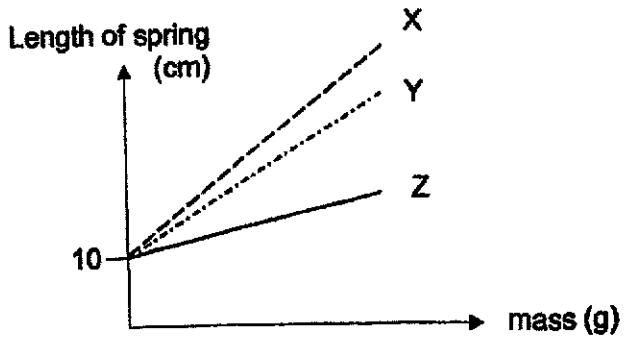
(b) Which two bulbs will be equally bright when all the bulbs lit up? [1]

_____

_____

Score 3

37. Huiyi hung some loads on springs X, Y and Z. She recorded her results in the graph as shown.



(a) What is the relationship between mass of the load and the length of spring? [1]

_____

_____

(b) Arrange springs X, Y and Z according to their ability to stretch. [1]

least stiff ⟶ most stiff

(i) _____ (ii) _____ (iii) _____

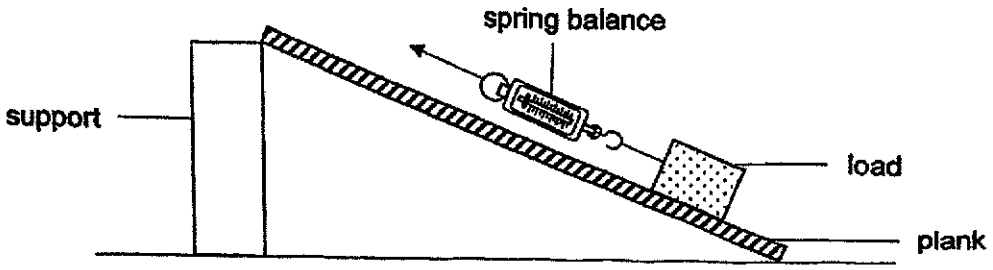
(c) Explain your answer in (b)(iii). [1]

_____

_____

Score ___/3

38. Zemin conducted an experiment using the set-up shown. He pulled load P up a plank using a spring balance. He repeated the experiment by using loads Q and R, made of the same material, but with different masses and area of contact with the plank.



He recorded his results in the table shown.

Load	Mass (g)	Surface area in contact with table (cm^2)	Pulling force (units)
P	50	100	60
Q	50	150	60
R	100	100	120

(a) Zemin wanted to find out the effect of the mass of the load on the pulling force. Which two set-ups should he use to ensure a fair test? [1]

_____

(b) Based on Zemin's result, did the area of contact of the load with the plank affect the frictional force between the load and the plank? Explain your answer. [2]

_____

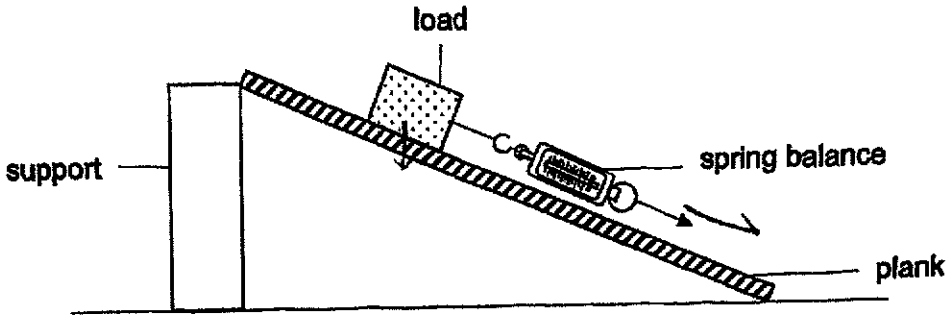
_____

Continued on page 32

Score	/ 3

Continued from page 31

Zemin pulled the load down the plank as shown in the diagram.



(c) Would the pulling force needed to move load P down the plank be less than, equal to or more than 60 units? Give a reason for your answer. [1]

_____

_____

Score	/ 1

39. The window of a train is made of switchable glass controlled electrically. The glass is coated with a special substance which switches the window between clear and frosty when electricity passes through it.

When the train is travelling far away from houses, the switch connected to the windows is turned on and the windows turn clear as shown in Diagram 1.

When the train travelling near houses, the switch is automatically turned off and the windows turn frosty as shown in Diagram 2. This is to provide instant privacy for the residents.

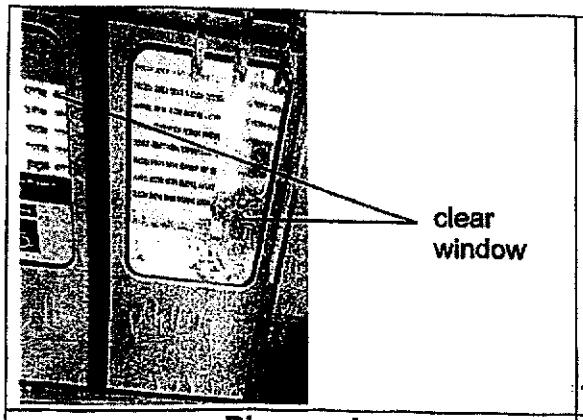


Diagram 1:
Travelling far away from houses: Windows look clear

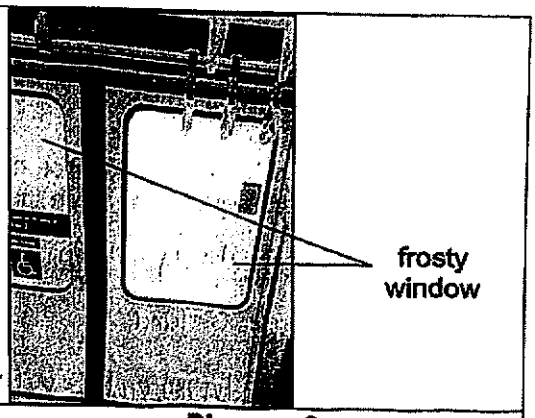
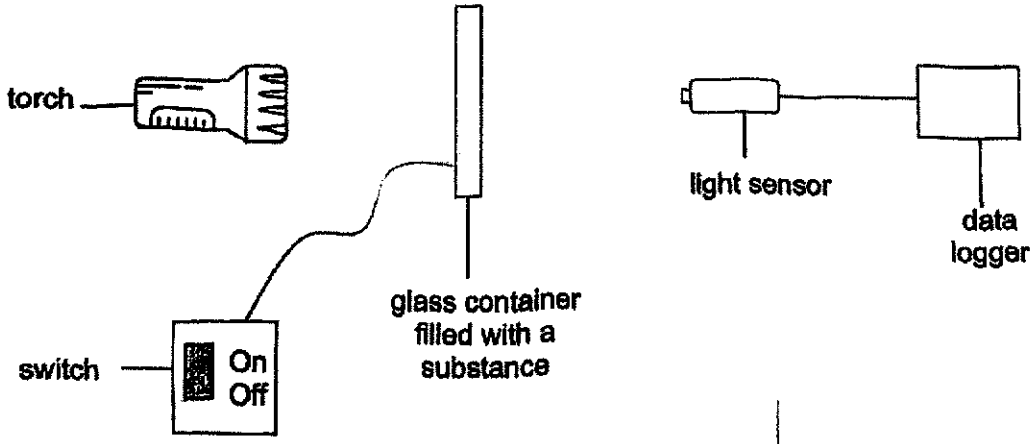


Diagram 2:
Travelling near the houses : Windows look frosty

Derrick conducted an experiment by shining a torch through a glass container filled with different types of substances, J, K and L, of the same volume, one at a time. The container was connected to a switch. The light sensor would detect the amount of light that passes through each glass container when the switch is turned off.



Continue on page 34

Continued from page 33

The results are shown in the table.

Type of substance in glass container	Amount of light detected by light sensor when the switch is turned off (unit)
J	45
K	3
L	20

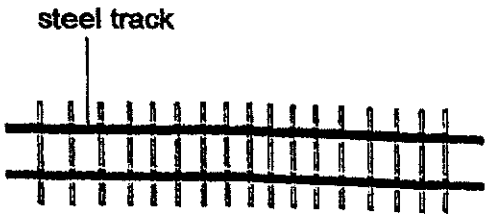
(a) Which substance, J, K or L, is most suitable to coat the windows of the train so as to protect the privacy of the residents most effectively as the train travels near the houses? Explain your answer. [2]

(b) Give a reason why Derrick should conduct the experiment in a dark room. [1]

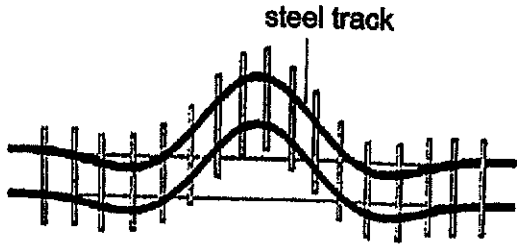
Score	3

40. Due to extreme temperature changes in some countries, railway tracks can buckle easily, resulting in train accidents.

The diagram shows an original railway track and one that is buckled.



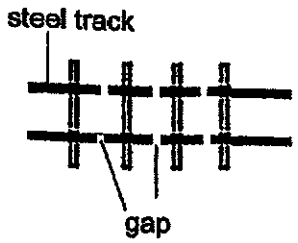
Original railway track



Buckled railway track

(a) State what temperature is. [1]

(b) Give a reason why the steel tracks can buckle as shown in the diagram above on a hot day. [1]



(c) Leaving a gap between each length of steel track as shown above will prevent the steel track from buckling.
Do you agree? State a reason for your answer. [1]

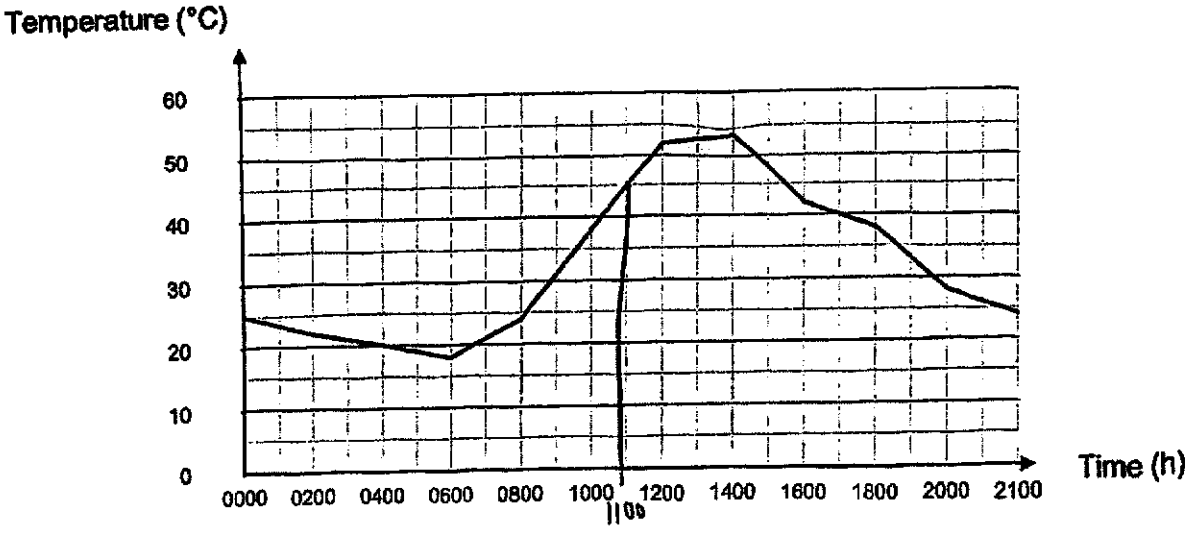
Continue on page 36

Score	3

Continued from page 35

Engineers use a predictive rail temperature system to monitor the temperature of railway tracks to determine if trains should travel at a slower speed or stop travelling .

The following graph shows the temperature of a railway track on a particular day.



The trains should stop travelling when the temperature of the railway tracks exceeds 45°C. For temperatures between 40°C to 45°C, the trains should travel at a slower speed.

(d) If the train travels on a one-hourly schedule starting from the train station, state the timings when the train should stop travelling: [1]

_____ to _____

Score 1

41. Li Ming made a ping pong ball launcher as shown in diagram 1.

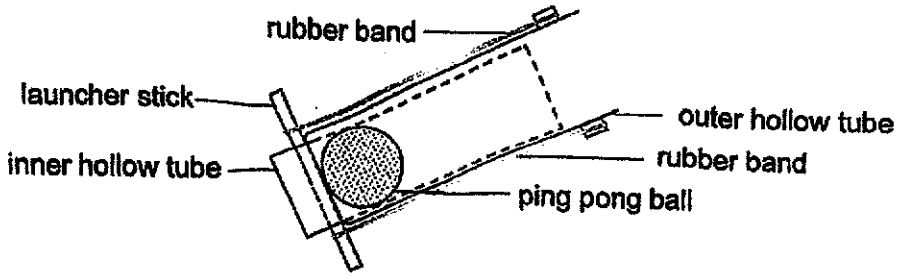


Diagram 1

To launch the ping pong ball, the launcher stick needs to be pulled back and then released, in the direction shown in diagram 2.

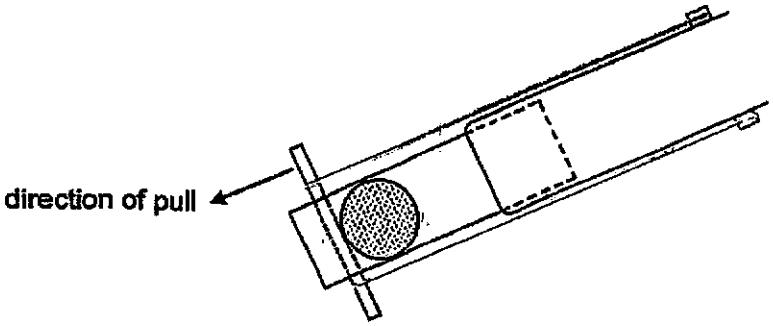


Diagram 2

Li Ming placed the launcher on the edge of the table to launch the ping pong ball. The ping pong ball moved in the path as shown in diagram 3.

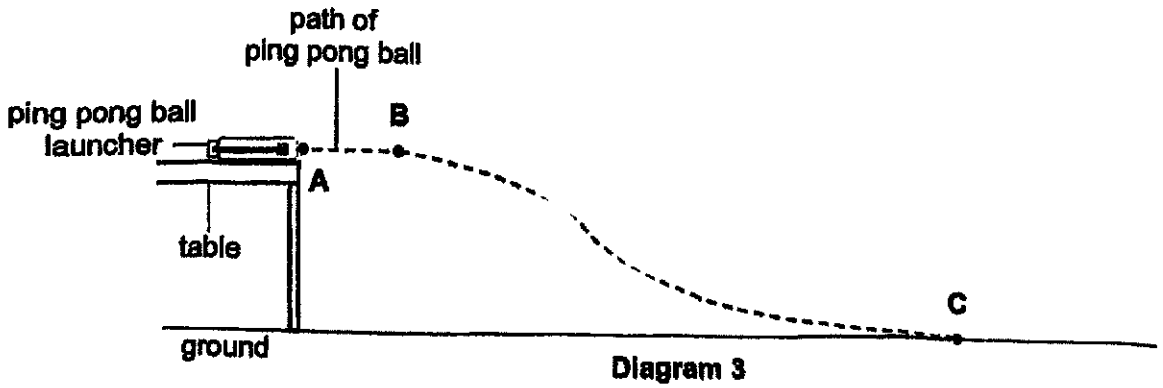
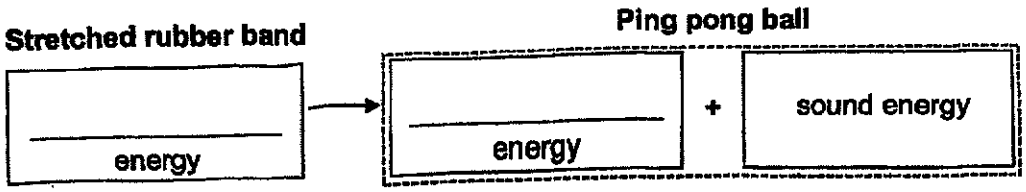


Diagram 3

Continue on page 38

Continued from page 37

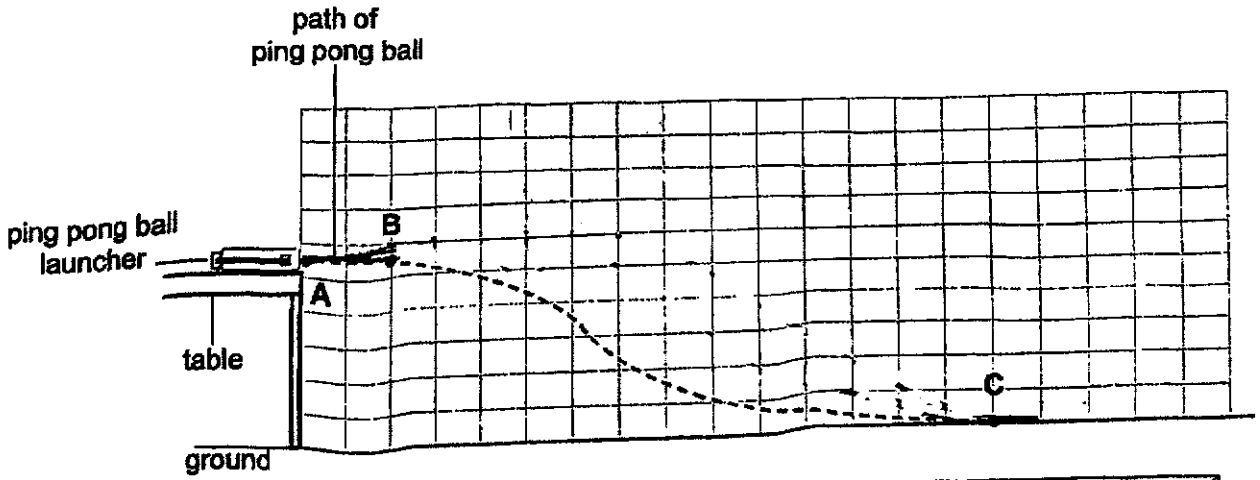
(a) Fill in the boxes with the main forms of energy when the ping pong ball started moving from release of the launcher stick to point B. [1]



(b) Explain why the ping pong ball moved lower and lower from point B to C. [2]

(c) Li Ming replaced the two rubber bands in the same ping pong ball launcher to stiffer ones. Then he pulled the launcher stick back to the same distance before re-launching the ping pong ball from the edge of the same table.

Draw a curved line in the diagram below to show the new path of the ping pong ball. [1]



Score	4

End of paper

SCHOOL : RAFFLES GIRLS PRIMARY SCHOOL
LEVEL : PRIMARY 6
SUBJECT : SCIENCE
TERM : 2024 PRELIMS

SECTION A

Q 1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
4	1	3	3	3	4	3	2	3	1
Q 11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
4	1	1	4	2	2	2	4	4	4
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28		
3	4	4	4	1	3	1	3		

SECTION B

Q29)

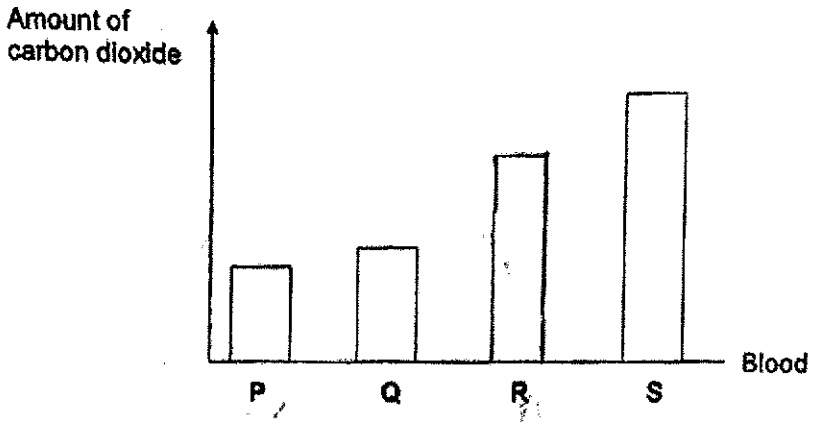
a) Yes. Animal A has six legs and three body parts which only insects have.
b) Living things respone to changes.

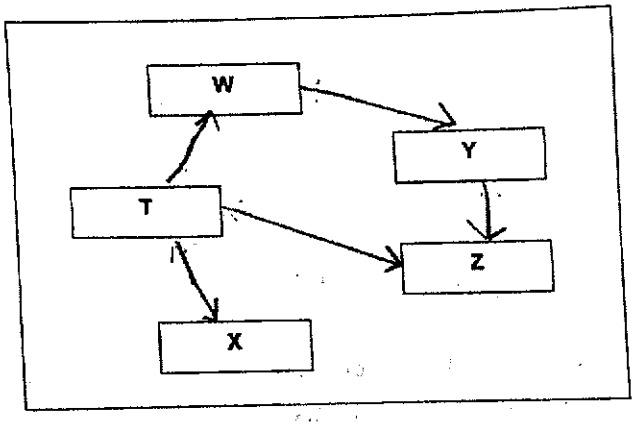
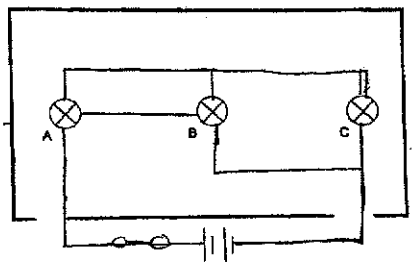
Q30)

a) Fibrous husk and waterproof outer covering.
b) As the river is flowing downstream, the fruit is drifted by the water current to P.
c) There was a presence of plants which provide food for the animals

Q31)

a) L is rich in oxygen while M is not rich in oxygen.
b)



	c) P. Our blood absorbs the oxygen where oxygen from the lungs entered the bloodstream.
Q32)	a)  b) They feed on different parts of the plant. c) Plants photosynthesis and give out oxygen needed by animals to respire.
Q33)	a) Animal P. Animal P has flippers instead of feet like Q. Hence increase surface are in contact with water. b) The temperature of the earth increases. Eventually, there maybe less female hatched from the eggs and hence there will be less females to male and reproduce resulting in the decreasing number of turtles.
Q34)	a) (i) B (ii) A b) The water in the funnel entered the flask in set up A more slowly as the air occupying the space into the flask cannot escape. The air in the flask can only be compressed to allow water to flow in more slowly to occupy the space previously occupied by the air.
Q35)	a) Substance Y is water droplets. The water in the compartment gains heat and boils and changes into steam which escapes through the hole. b) The steam loses heat into more to the cooler surrounding air and condense into water droplets.
Q36)	a)  b) B and C
Q37)	a) As the mass of the load increases, the length of spring increases. b) (i) X (ii) Y (iii) Z c) Z is most stiff as when some load was hung, mass is added to the spring, it stretched the most.

Q38)	a) P , R b) No. Q have same mass but different area in contact with the plank. c) Gravitational force is pulling the load downward with the pulling force hence less pulling is required to pull it down the plank.
Q39)	a) K. Window coated with K allows least amount of light to pass through, so least light will be reflected by the houses. b) To ensure that only the amount of light from the torch is detected and no other light from outside.
Q40)	a) Temperature is the degree of measurement of how hot or cold an object is. b) Steel is a good conductor of heat, when gained heat from the surroundings, the steel tracks can expand resulting in buckled railway track. c) To create space for expansion to occur. d) 1100 to 1600
Q41)	a) Elastic Potential Energy → Kinetic Energy b) The gravitational potential energy of the ball has been converted to kinetic and sound energy. The gravitational force activity on the ball pulls it downward. c)