



CATHOLIC HIGH SCHOOL
PRIMARY 6
PRELIMINARY EXAMINATION 1
2012

SCIENCE
EM 1 / EM 2

Name: _____ ()

Class : Primary 6 _____

Date : 15 May 2012

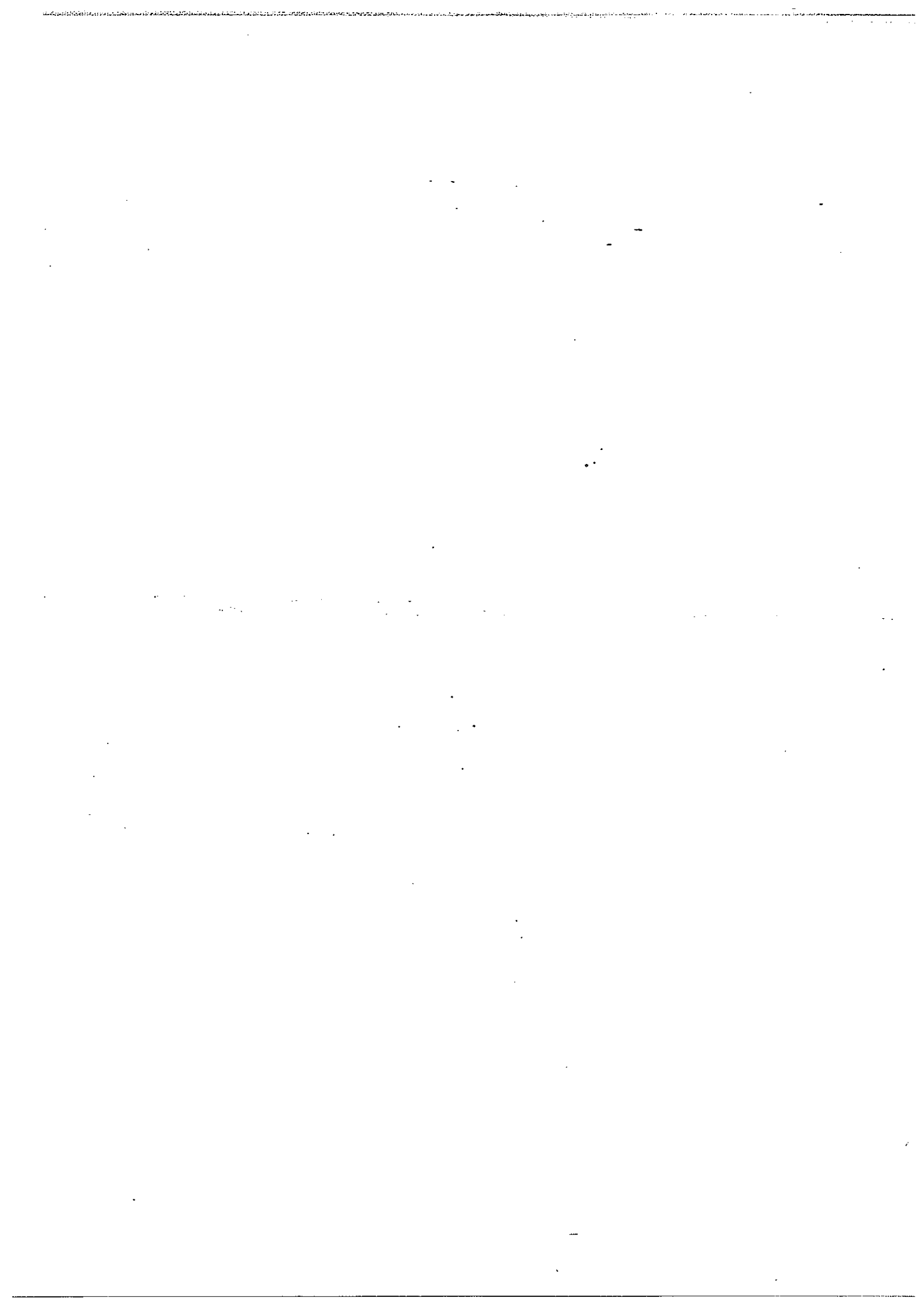
BOOKLET A

30 Questions
60 Marks

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

Instructions to Candidates

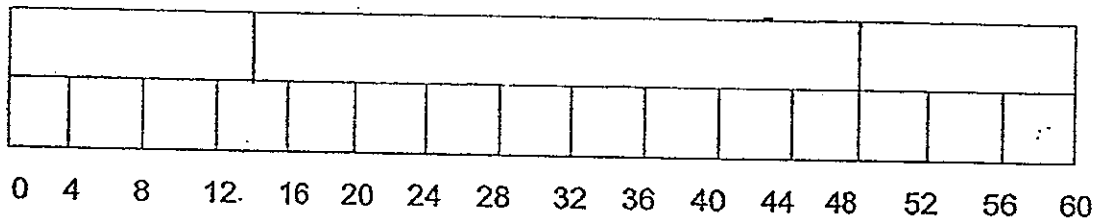
Do not open this booklet until you are told to do so.
Follow all instructions carefully.
Answer all questions.



Section A: Multiple Choice Questions (60 marks)

For each question from 1 to 30, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4) on the Optical Answer Sheet.

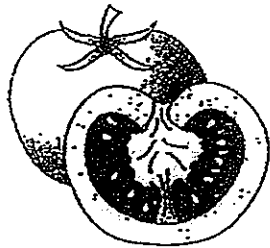
1. Simon observed the grasshopper as it developed from an egg to an adult. He represented his findings in the data below.



How many days are there in the nymph stage of the grasshopper?

- (1) 9 days
- (2) 16 days
- (3) 34 days
- (4) 48 days

2. The diagram below shows the fruit of a plant.



Some students made the following statements about this fruit.

- A It has edible parts.
- B It has many flowers
- C It is a flowering plant
- D Its ovary contains more than one ovule.

Based on the diagram only, what conclusion(s) can you draw about the plant above?

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

3. The table below shows the physical characteristics of Sharon and her parents, Mr and Mrs Tan.

	Physical Characteristics			
	Hair length	Dimples	Eyelids	Earlobes
Mr Tan	Short	No	Double	Detached
Mrs Tan	Long	Yes	Single	Attached
Sharon	Short	Yes	Double	Attached

How many characteristics did Sharon inherit from her parents?

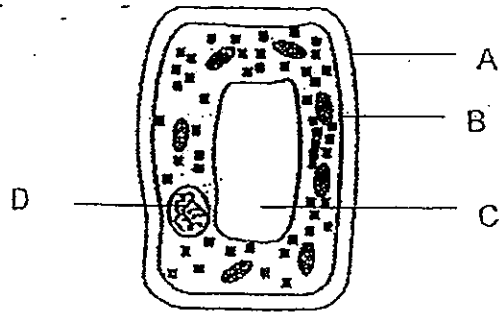
- (1) She inherited one from her father and one from her mother.
 - (2) She inherited one from her father and two from her mother.
 - (3) She inherited two from her father and one from her mother.
 - (4) She inherited two from her father and two from her mother.
4. Cathy examined three cell specimens under a microscope. She recorded her observations in the table below.

Cell parts	Cell W	Cell X	Cell Y	Cell Z
Cell wall	✓		✓	
Chloroplasts	✓			
Nucleus	✓		✓	✓
Cell membrane	✓	✓	✓	✓

Which cell is most likely to represent an onion cell?

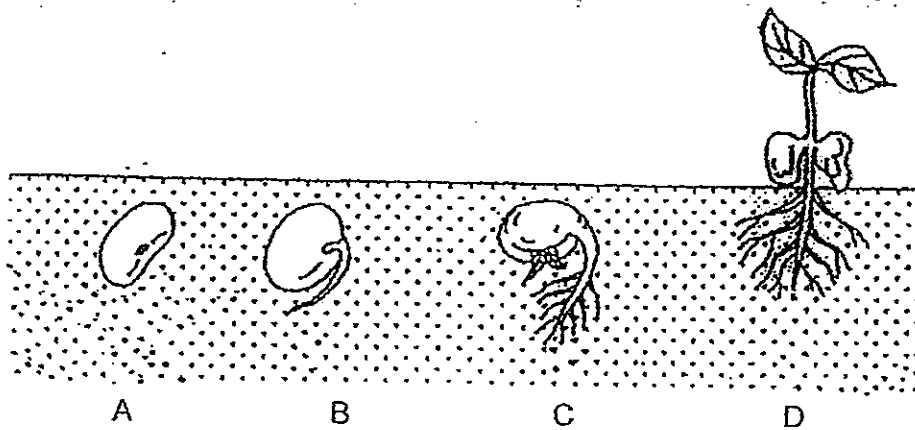
- (1) Cell W
- (2) Cell X
- (3) Cell Y
- (4) Cell Z

5. Which part of the cell below controls the movement of materials in and out of the cell?



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

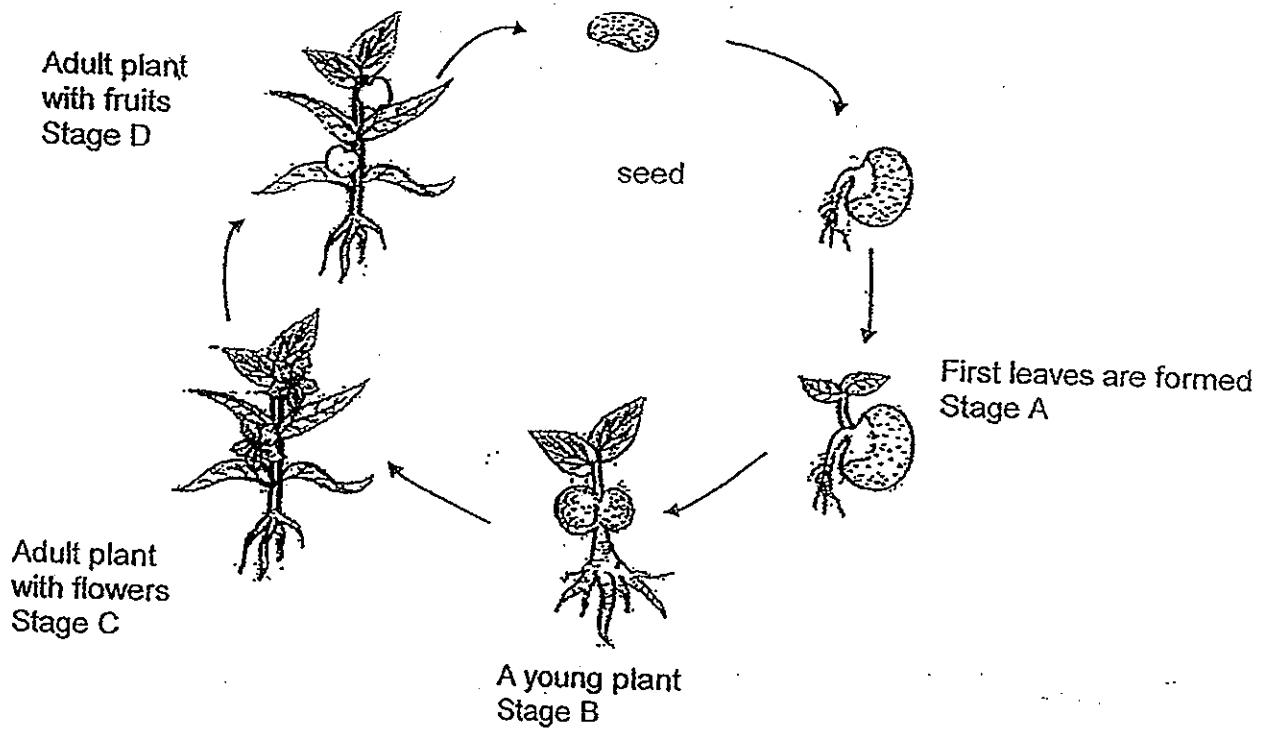
6. Peter observed a seed as it germinated into a young plant. He recorded his observations as shown below.



At which stage(s) do/does the germinating seed take in oxygen?

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

7. The diagram below shows a plant that is pollinated by insects



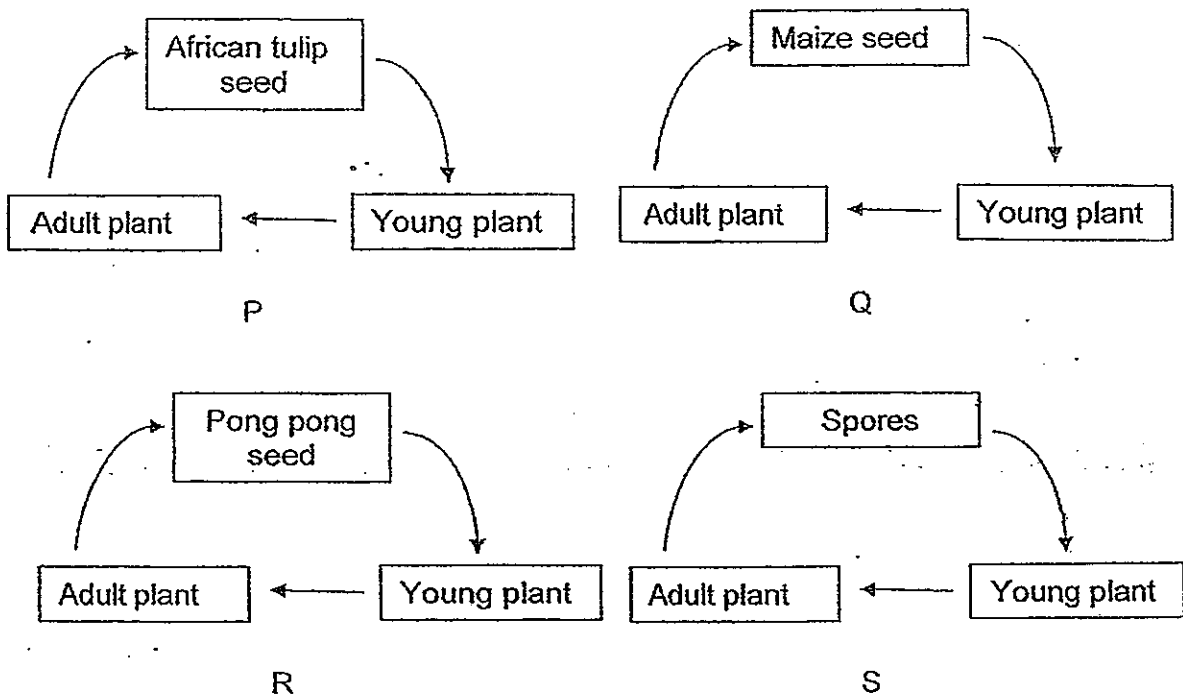
If the insects pollinating the plants above are completely destroyed, which stage will be affected first?

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

8. The following table shows some characteristics of two plants, A and B.

	Plant A	Plant B
Dispersed by water?	No	Yes
Bears flowers?	No	Yes

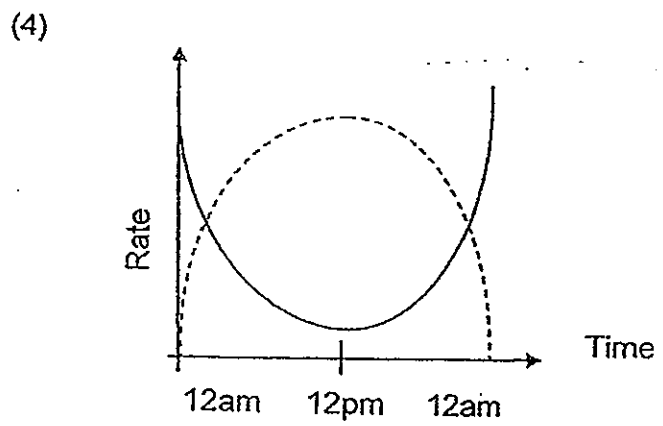
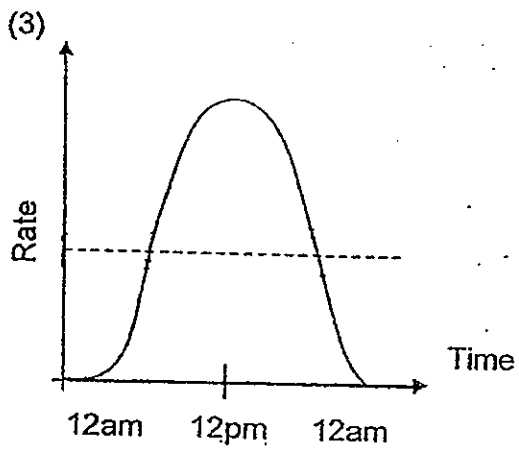
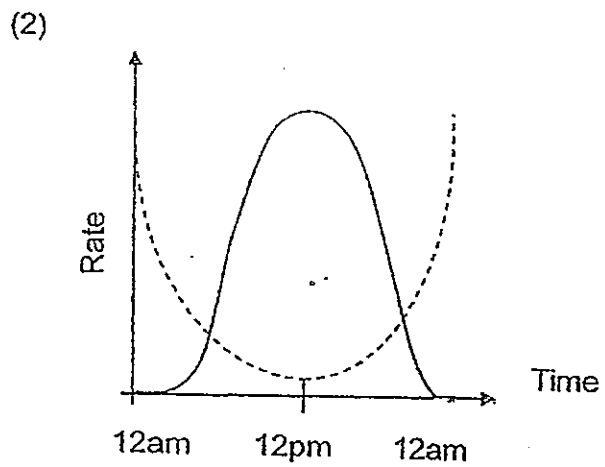
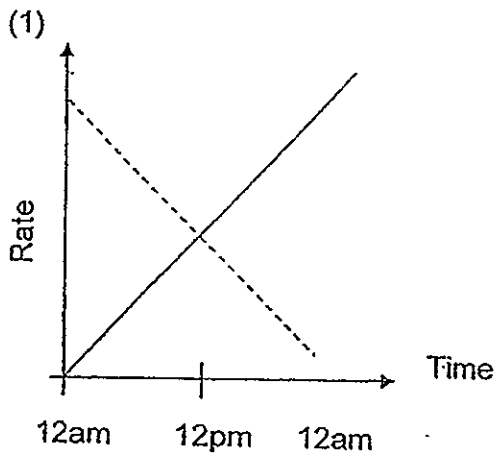
The following show the life cycles of four plants P, Q, R and S.



Which life cycles (P, Q, R and S) do Plants A and B belong to respectively?

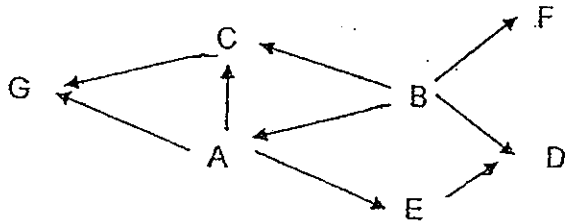
	Plant A	Plant B
(1)	P	Q
(2)	R	S
(3)	S	R
(4)	S	P

9. The graphs below show how the changes from night to day affect the rate of photosynthesis and respiration of a green plant. Which one of the graphs correctly shows the change in the rate of the activities?



Key :	
— (solid line)	Respiration
- - - (dashed line)	Photosynthesis

10. The food web below shows the food relationship among various organisms in a particular community.



Farah made the following observations about the above organisms A, B, C, D, E, F and G. Based on the above information, which of the following statements is correct?

Statements	True	False	Not possible to tell
(1) B is a green plant.			√
(2) E is a food consumer.		√	
(3) There are 2 animals which eat both plants and animals.	√		
(4) G and D do not have any predators feeding on them.			√

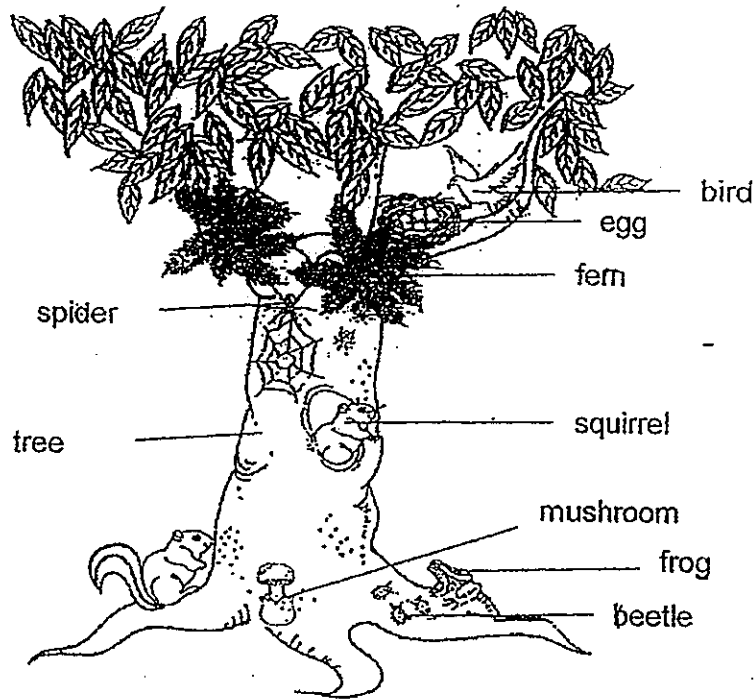
11. Tom studied the habitats of some organisms and discovered that different organisms grow well under different conditions.

		Factor B	
		High	Low
Factor A	High	Bacteria	Mushroom Woodlice Earthworm
	Low	Cacti Camel Snake	Micro-organisms

He grouped the organisms according to two environmental factors A and B. Based on his data collected above, what are Factors A and B?

	Factor A	Factor B
(1)	Temperature	Amount of water
(2)	Amount of air	Amount of heat
(3)	Amount of food	Amount of light
(4)	Amount of water	Temperature

12. A group of pupils observed the tree below and made the following statements.

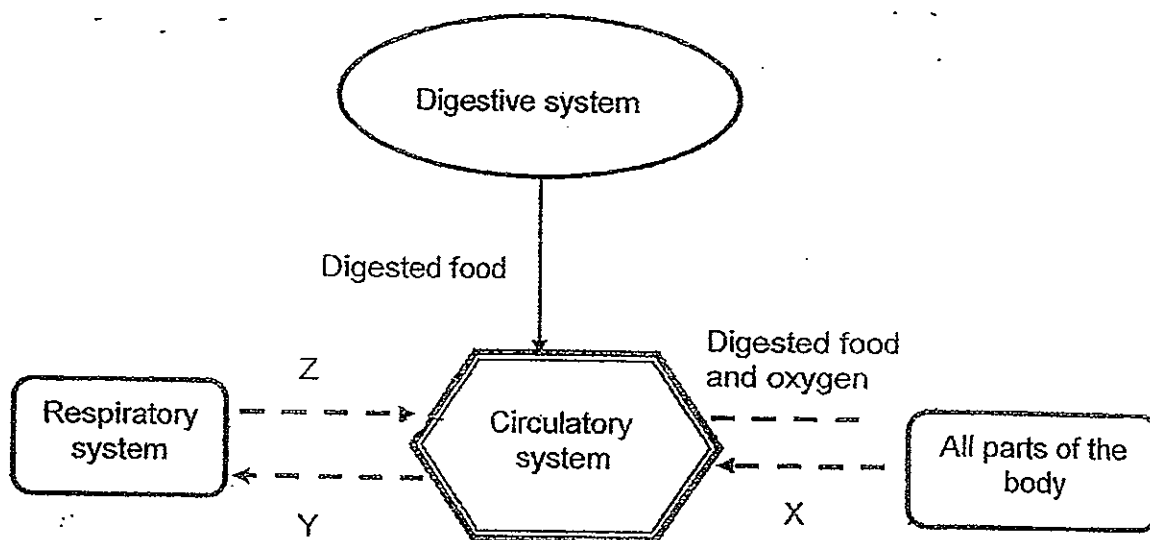


- Susan: There are 8 populations.
Ravi : There is only one community.
Tom : All the living things on the tree are consumers,
Alan : All the living and non-living things make up the community.

Who has made a correct statement?

- (1) Ravi only
- (2) Tom and Alan only
- (3) Ravi and Susan only
- (4) Susan, Tom and Alan only

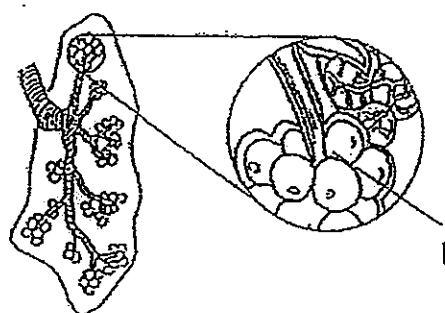
13. The diagram shows how the circulatory, digestive and respiratory systems in our body work together. X, Y and Z represent the gases that are transported by these systems.



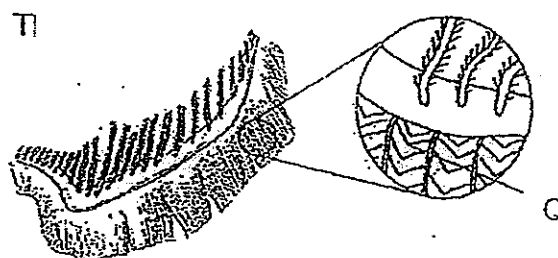
Which one of the following correctly shows the amount of gases represented by X, Y and Z?

	X	Y	Z
(1)	High oxygen	High carbon dioxide	High oxygen
(2)	Low oxygen	Low oxygen	Low carbon dioxide
(3)	Low carbon dioxide	High carbon dioxide	Low carbon dioxide
(4)	High carbon dioxide	Low oxygen	High carbon dioxide

14. The diagrams below show parts of the human and fish system.



Part of the human system

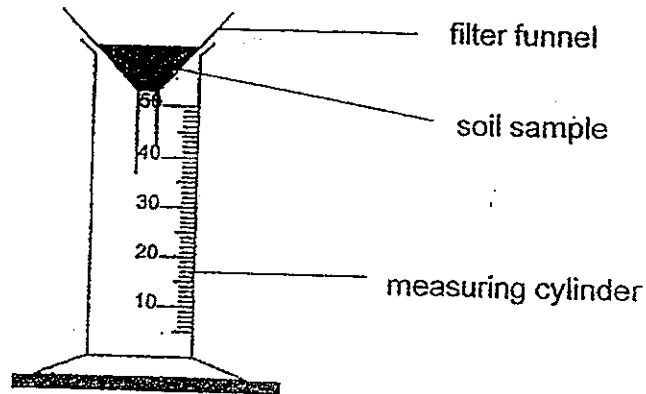


Part of the fish system

Which of the following is a function of both P and Q?

- (1) They transport food.
- (2) They transport water.
- (3) They remove waste materials.
- (4) They allow for gaseous exchange.

15. Ross set up the experiment below to find out how quickly water can pass through two different types of soil.



The time taken for the water to pass through each type of soil was measured and recorded in the table below.

Type of soil	Soil A	Soil B
Time taken / seconds	15	40

Which one of the following correctly represents the properties of Soil A and Soil B?

	Size of soil particles	Size of air spaces
(1)	Larger in A than B	Smaller in A than B
(2)	Larger in A than B	Larger in A than B
(3)	Smaller in A than B	Larger in A than B
(4)	Smaller in A than B	Larger in B than A

16. Brandon wanted to test the hardness of 4 different materials, A, B, C and D. He used the materials to scratch each other and recorded the results in his journal as shown below.

- B cannot be scratched by A.
- C can be scratched by A but not D.

Based on his results above, which one of the following shows the 4 materials arranged in increasing order of hardness?

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

17. John magnetised a steel rod XY using a magnet as shown in Diagram 1.

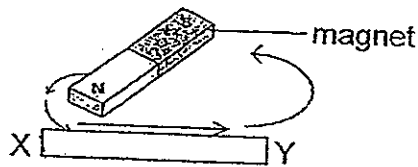


Diagram 1

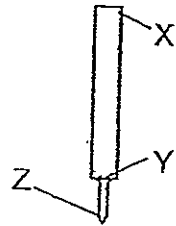


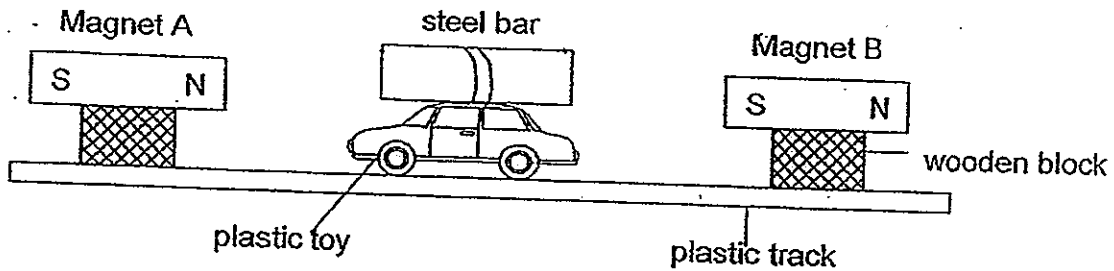
Diagram 2

The steel rod was then used to attract an iron nail as shown in Diagram 2.

What are the magnetic poles of the parts marked X and Z?

	X	Z
(1)	South	South
(2)	North	South
(3)	South	North
(4)	North	North

18. A plastic toy car with a steel bar was placed on a plastic track as shown below. The toy car was then given a push towards Magnet B.



Which of the following observation about the above experiment is correct?

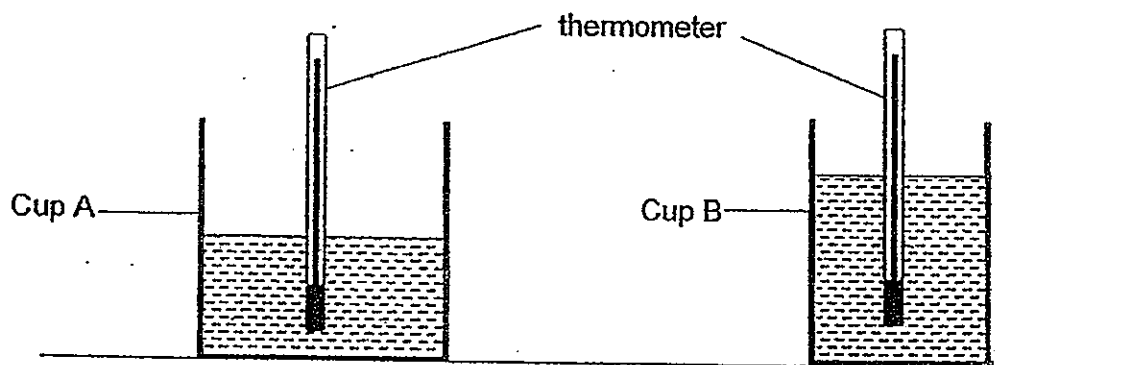
- (1) The car was repelled by Magnet B and pushed away.
- (2) The car stopped moving once it was attracted to Magnet B.
- (3) The car moved continually between Magnet A and Magnet B.
- (4) The car was attracted by Magnet A after moving towards Magnet B.

19. Four wet bath towels were left to dry in four different places from 11am to 2 pm. The masses of the towels were measured at the beginning and at different intervals during the day. The table below shows the results.

Time	Towel A/kg	Towel B/kg	Towel C/kg	Towel D/kg
11 am	3.0	1.5	2.0	2.0
12 pm	2.5	1.2	1.6	1.8
1 pm	2.0	0.8	1.2	1.6
2 pm	1.5	0.8	0.8	1.6

Which towels were completely dry by 1pm?

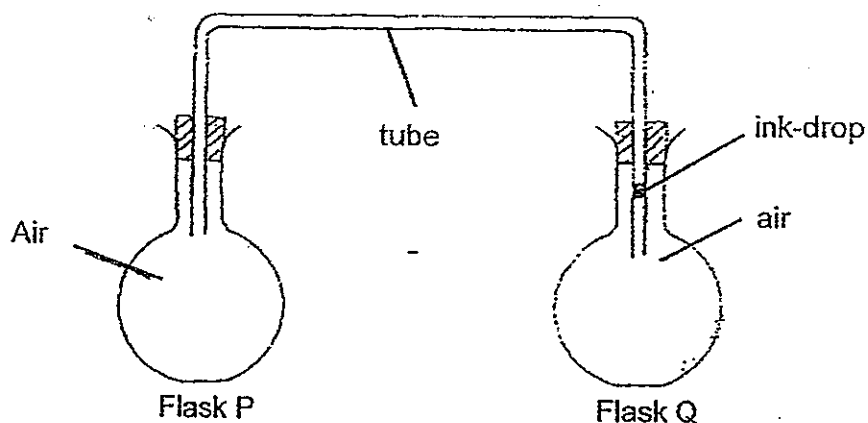
- (1) A and B
 - (2) B and C
 - (3) B and D
 - (4) C and D
20. Alim wanted to find out which material is a better conductor of heat. He used two cups, A and B, which were made of different materials. He filled the same amount of water at 80°C into the cups and measured the temperature of the water every minute. His set-up was left under the fan in the Science room.



Why did Alim's teacher say that his experiment was not a fair one?

- (1) The exposed surface area of the water was different.
- (2) The water level in Cup B was higher than that of Cup A.
- (3) The amount of wind and the size of the cup should be kept the same.
- (4) The material used for Cup A was a better conductor of heat than Cup B.

21. Study the set-up shown below.



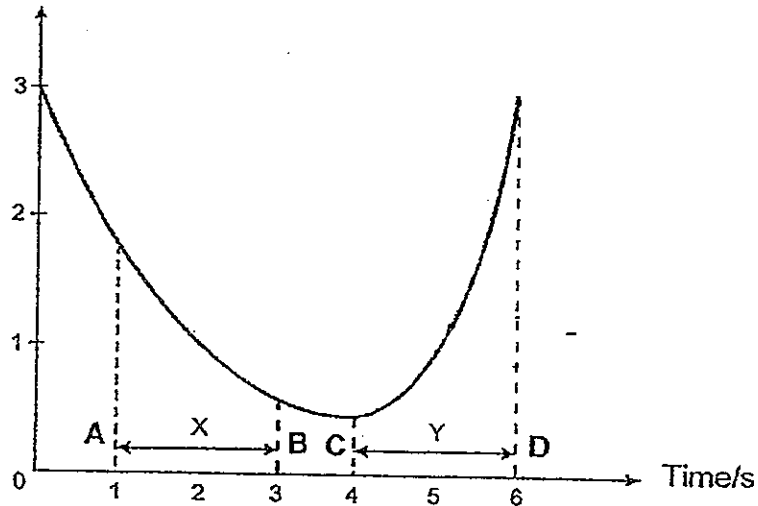
Dan wanted to find out if the ink drop will move in the tube in the above set-up when the set-up is placed in basins containing water of different temperatures.

Which of the following arrangements is most likely to make the ink-drop fall into Flask Q?

	Place Flask P in a basin of ...	Place Flask Q in a basin of ...
(1)	warm water	boiling water
(2)	boiling water	ice water
(3)	ice water	warm water
(4)	sea water	tap water

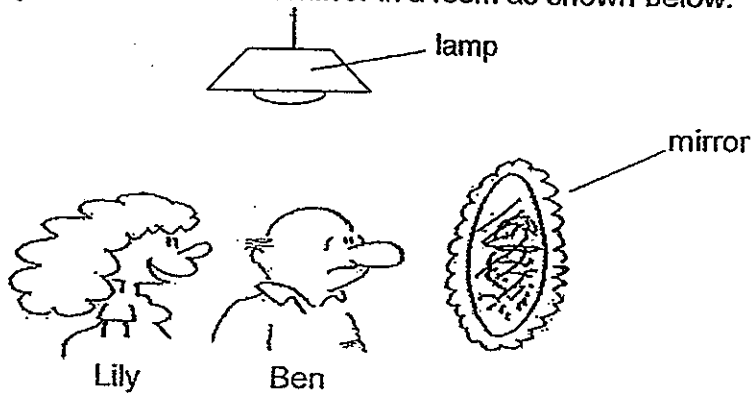
22. The graph below shows how the length of Anna's shadow changes over a period of time when she walks in a straight line near a street lamp at night.

Length of shadow/m



Based on the graph, which one of the following statements is correct?

- (1) She walks slower from A to B than from C to D.
 - (2) She is furthest from the street lamp at the 4th second.
 - (3) She is walking away from the lamp from point A to point B.
 - (4) She walks at the same speed from A to B and from C to D.
23. Ben and Lily stand in front of a mirror in a room as shown below.



Which one of the following statements best explains how Ben is still able to see Lily clearly even though she is standing behind him?

- (1) The light given off by Lily is reflected by the mirror into Ben's eyes.
- (2) The mirror reflects light from the lamp which travels into Ben's eyes.
- (3) The light from the lamp falls on Ben and is reflected by the mirror into Lily's eyes.
- (4) The light from the lamp falls on Lily and is reflected by the mirror into Ben's eyes.

24. Study the circuit below. Bulbs A, B and the two batteries are identical. When the switch touches point Y on the circuit as shown in diagram 1, bulb A is unlit while bulb B is lit with a brightness of 2 units.

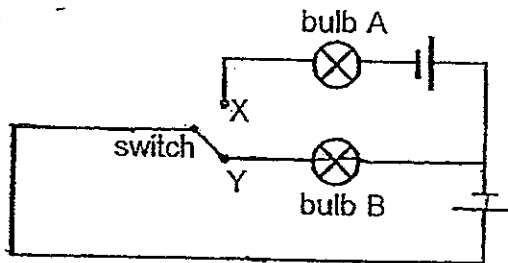


Diagram 1

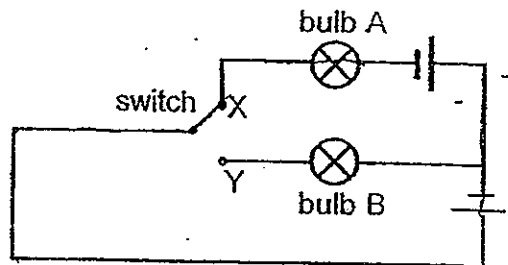
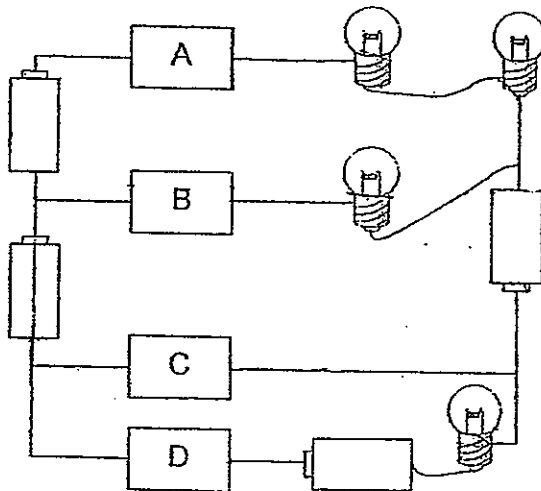


Diagram 2

If the switch is moved to touch point X as shown in diagram 2, what would happen to bulbs A and B?

	Bulb A	Bulb B
(1)	unlit	unlit
(2)	unlit	dimmer than 2 units
(3)	brighter than 2 units	unlit
(4)	dimmer than 2 units	unlit

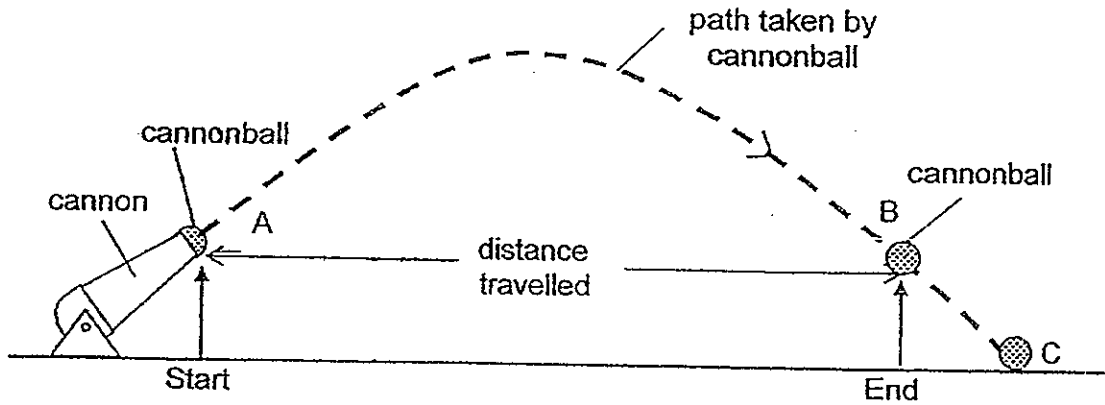
25. Four materials, A, B, C and D of similar size and mass were connected in the electrical circuit as shown below.



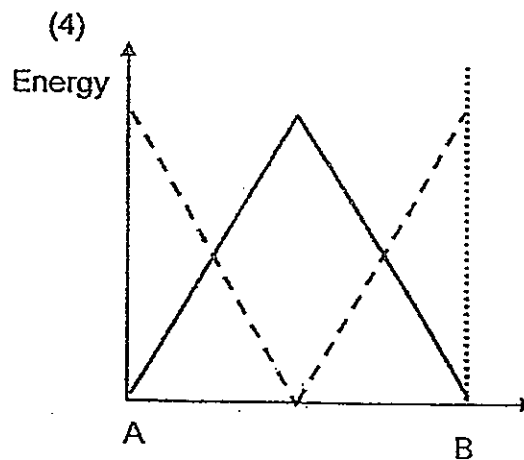
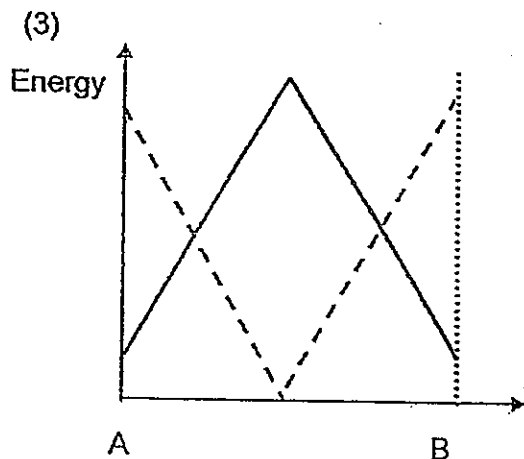
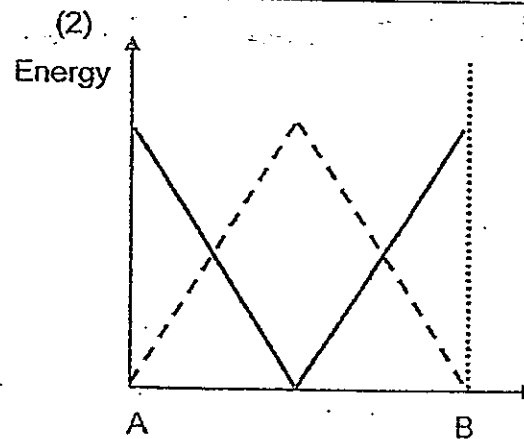
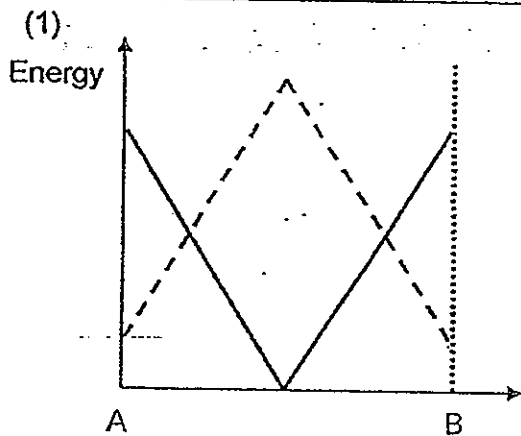
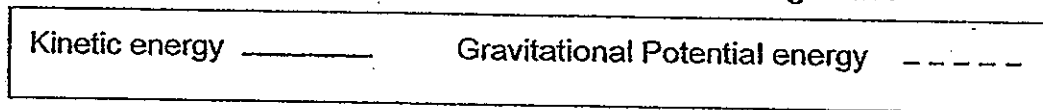
Which one of the following correctly represents the materials, A, B, C and D, in the electrical circuit so that only two of the bulbs will light up?

	Material A	Material B	Material C	Material D
(1)	wood	plastic	rubber	gold
(2)	lead	wood	iron	plastic
(3)	steel	copper	glass	rubber
(4)	iron	glass	wood	lead

26. A cannonball is fired from a cannon and moves through the path as shown in the diagram below.



Which one of the following graphs correctly shows the changes in the amount of gravitational potential energy and kinetic energy of the cannonball from point A where it leaves the cannon to point B just before it reaches the ground?



27. Nicky carried out an experiment to find out the relationship between the number of times the key to a toy car was turned and the distance it travelled over a surface. He recorded his results in a table as shown below.

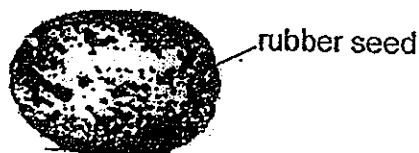
Number of times the key was turned	4	6	8	10
Distance travelled /cm	20	32	48	68

Which of the following statements that Nicky made are true about the experiment?

- A The kinetic energy that the toy car possessed was constant.
- B The toy car possessed the greatest potential energy when it was moving along the surface.
- C The potential energy of the toy car was greater when the number of times the key was turned increased.
- D Potential energy was converted to kinetic, heat and sound energy when the toy car was released.

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

28. A rubber seed was continuously rubbed on a rough floor for a few minutes.



Which one of the following best describes the energy conversion in the rubber seed?

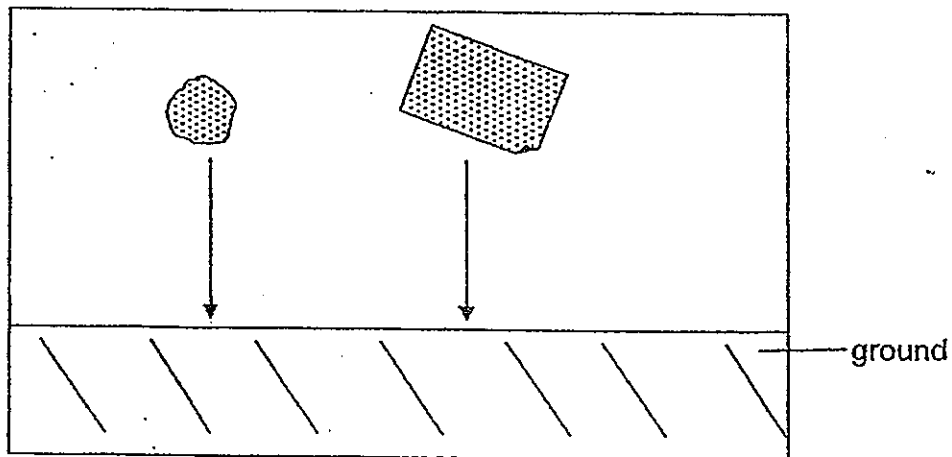
- (1) Heat Energy + Sound Energy \rightarrow Kinetic Energy
- (2) Kinetic Energy \rightarrow Heat Energy + Sound Energy
- (3) Chemical Potential Energy \rightarrow Heat Energy + Sound Energy
- (4) Chemical Potential Energy \rightarrow Heat Energy + Sound Energy \rightarrow Kinetic Energy

29. The diagram below shows an object that is hung on a spring balance.



What is the force that the spring in the balance exerted on the object?

- (1) Gravity
 - (2) Friction
 - (3) Elastic spring force
 - (4) The weight of the object
30. Two pieces of identical papers, one crumpled into a ball, are released from the same height at the same time as shown in the diagram below.



The crumpled ball of paper reaches the ground first because _____.

- (1) its mass is greater
- (2) its weight pulls it down faster
- (3) the force of gravity exerted on it is lesser
- (4) the air resistance that acted on it is lesser



CATHOLIC HIGH SCHOOL
PRIMARY 6
PRELIMINARY EXAMINATION 1
2012

SCIENCE
EM 1 / EM 2

Name: _____ ()

Class : Primary 6 _____

Date : 15 May 2012

BOOKLET B

16 Questions
40 Marks

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

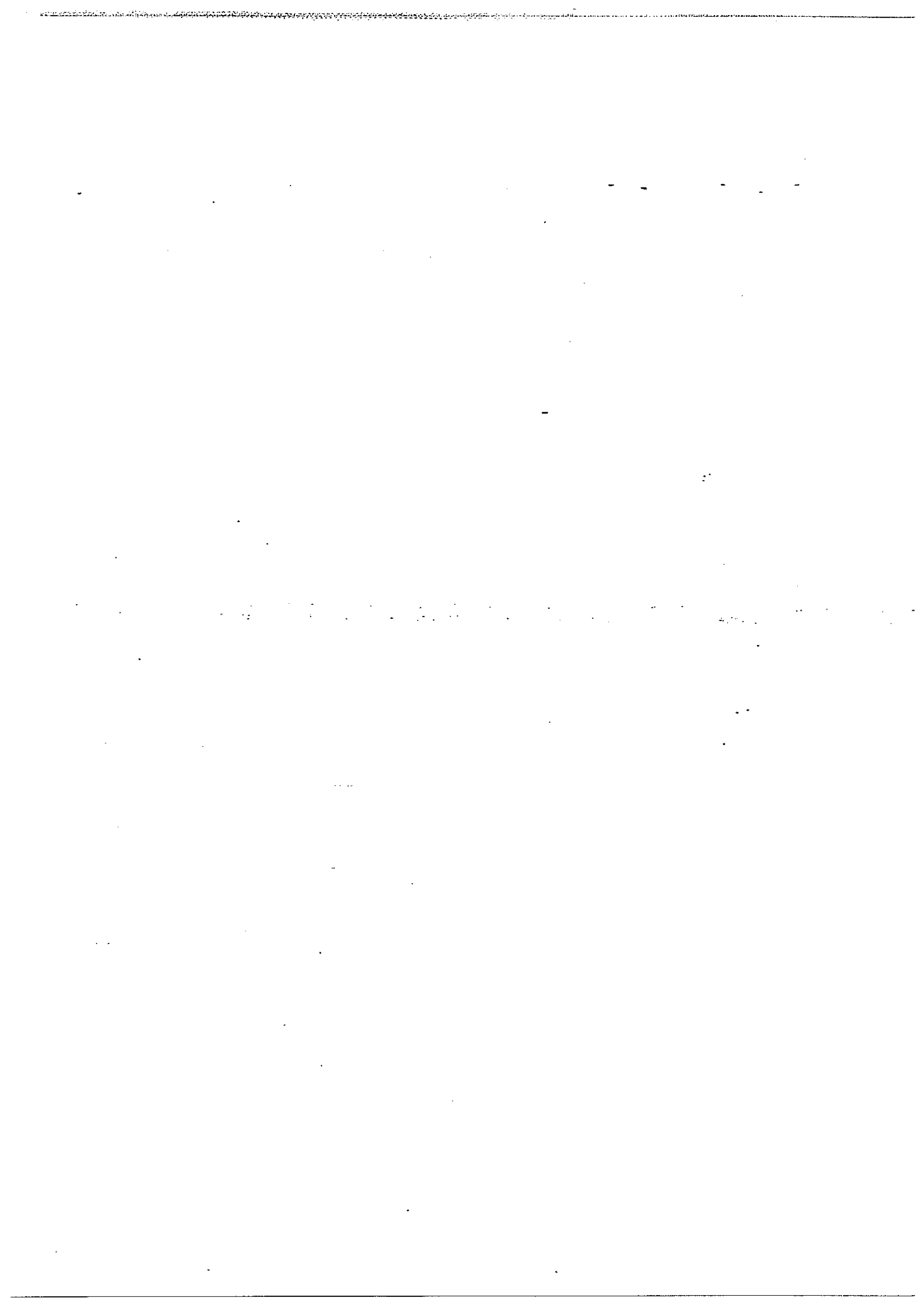
Instructions to Candidates

Follow all instructions carefully.
Answer all questions.

Parent's Signature: _____

Date: _____

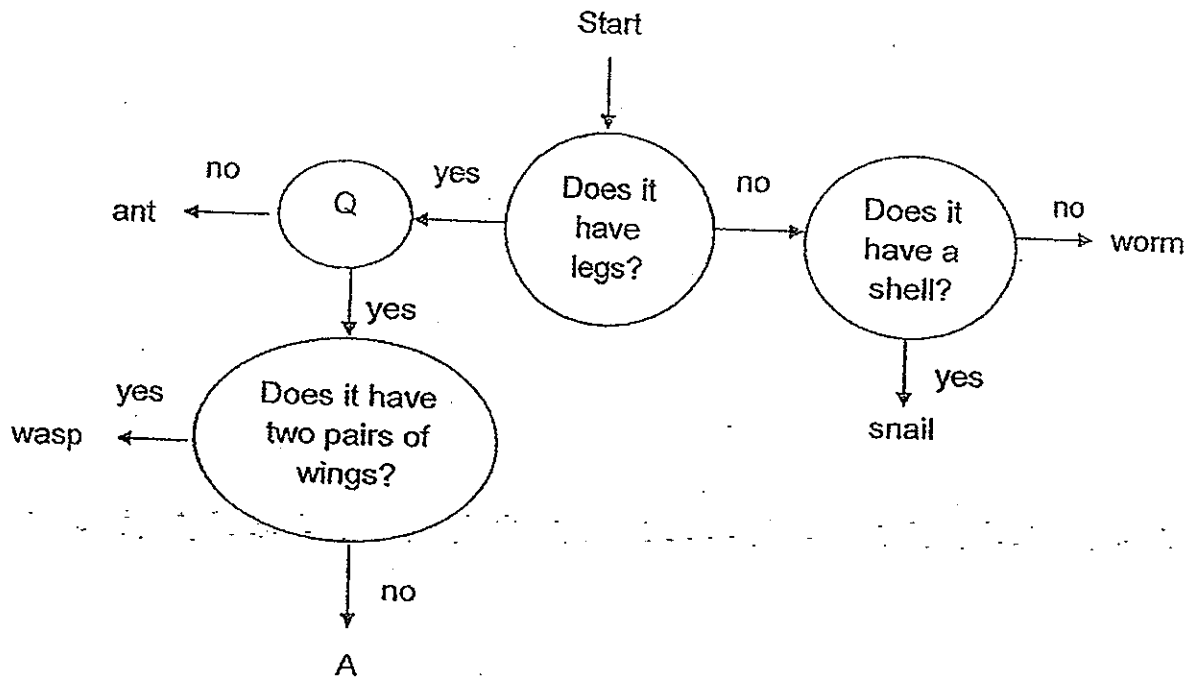
Score	
Section A	60
Section B	40
Total	100



Section B: Open-ended Questions (40 marks)

Read the following questions carefully and write your answers in the space provided. The maximum marks that can be awarded are shown at the end of each question or part-question.

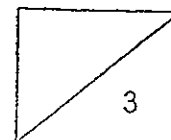
31. The flowchart below shows how some animals are classified.



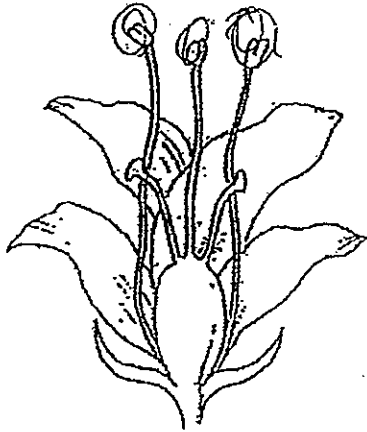
(a) Write the question that can be placed in Q. [1]

(b) Based on the flowchart, describe Animal A. [1]

(c) What is the difference between the snail and the ant? [1]



32. Study the diagrams below.



Flower A



Flower B

(a) Based on your observations, state the agent of pollination. [1]

Flower	Agent of pollination
A	
B	

(b) Support your choice with a reason. [2]

Flower	Reason
A	
B	

33. Study the table below carefully.

	Animals	Plants
Male sex cell	X	Pollen
Female sex cell	Eggs	Y

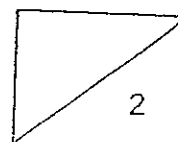
(a) Identify

[1]

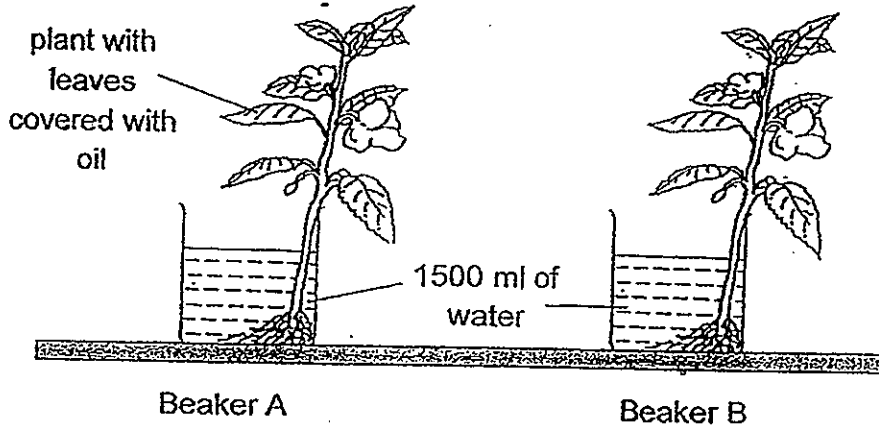
X : _____

Y : _____

(b) What happens when fertilisation takes place in the reproductive system? [1]



34. Siew Lee wanted to find out the amount of water taken in by a plant. She placed a healthy plant in Beaker A and another identical plant in Beaker B. Both beakers were identical.



The table below shows the volume of water in the beakers at the beginning of the experiment on Day 1 and at the end of the experiment on Day 2.

Beaker	Volume of water / ml	
	Day 1	Day 2
A	1500	1350
B	1500	1250

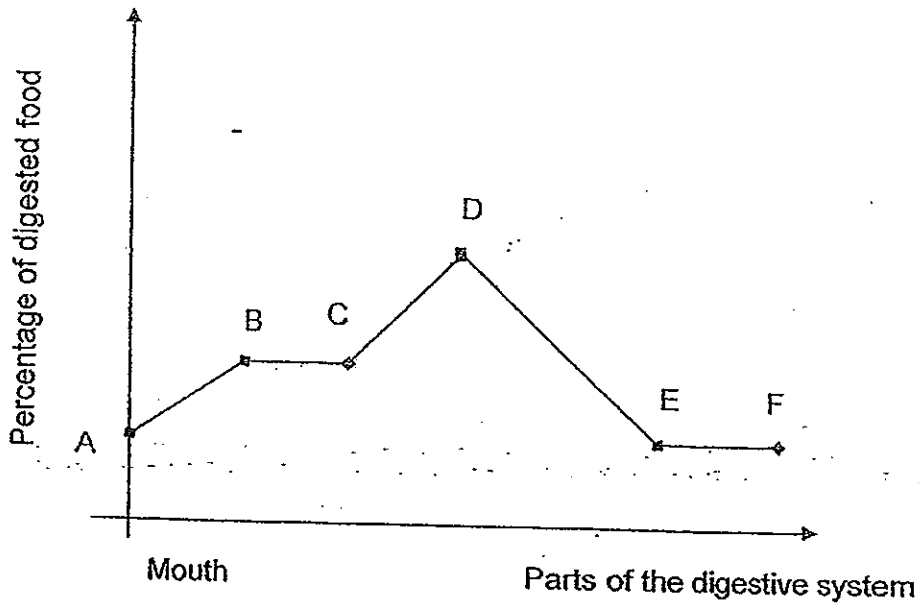
- (a) Why was there a difference in the amount of water left in Beakers A and B at the end of the experiment? [1]

- (b) What was the volume of water taken in by the plant in Beaker B? [1]

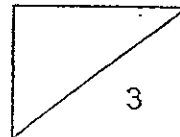
- (c) Draw a control set-up for the above experiment. [1]

- (d) Suggest one way Siew Lee can improve her experiment so that she would not need to use a control. [1]
-

35. Mel ate a cheeseburger for lunch. The graph below shows the amount of digested food in her body over a period of two hours after she had eaten it.

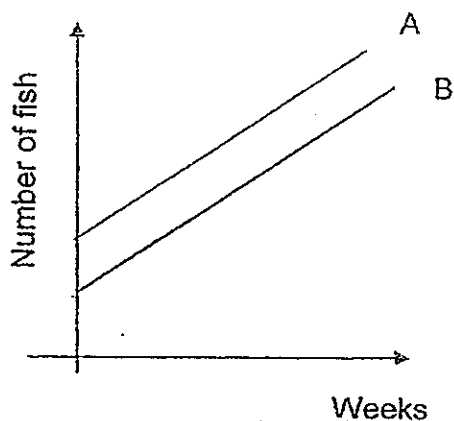


- (a) Which line in the graph above represents the organ with the most number of blood vessels? [1]
-
- (b) Explain your answer in (a) [1]
-
-

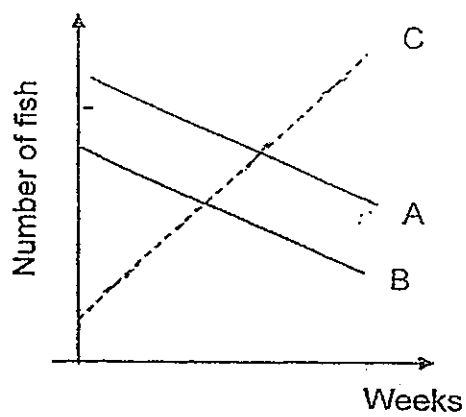


36. Julian caught three types of fish A, B and C from a river and placed them in two aquariums, P and Q. He put Fish A and B into Aquarium P and fish A, B and C into Aquarium Q. Equal number of aquatic plants found in the river were placed in both aquariums. Both aquariums were placed in a well-lit room.

He counted the number of fish every week for a month and recorded the results in the graph below.



Aquarium P

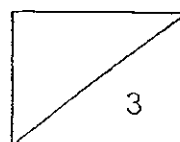


Aquarium Q

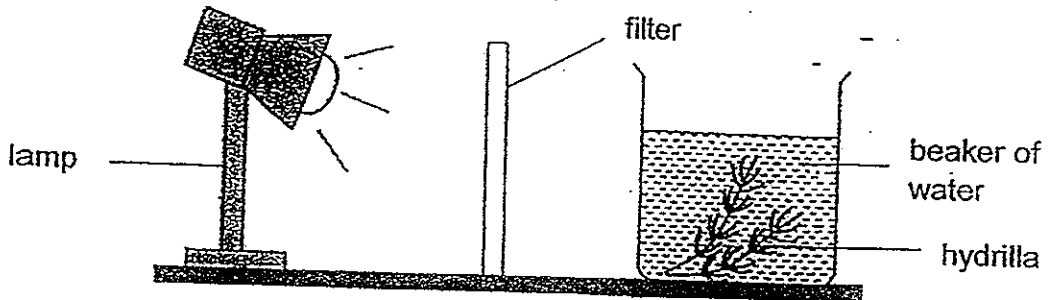
- (a) Based on the information given above, write a possible food web to show the relationship between the organisms. [1]

- (b) Name two benefits that the aquatic plants provide for the fish. [1]

- (c) Fish also provide carbon dioxide for the plant to make food. How else does the fish benefit the plant? [1]



37. Sam set up an experiment as shown below. He placed a coloured filter in front of the lamp and shone the light at the hydrilla plant. He placed the set-up in a dark room.



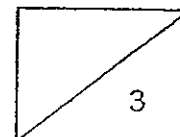
He observed the number of bubbles produced and recorded his findings in the table below. He then repeated his experiment using another coloured filter.

Colour of filter	Number of bubbles produced
Green	12
Blue	30
Yellow	25
Red	18
Clear	35

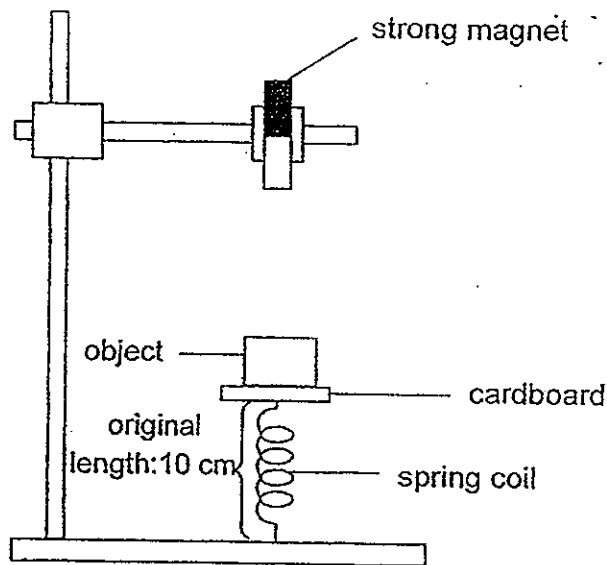
- (a) What is the aim of Sam's experiment? [1]

- (b) Give a reason why the experiment should be conducted in a dark room to ensure a fair test. [1]

- (c) What is the purpose of using a clear filter? [1]



38. Li Ling set up the experiment as shown below.

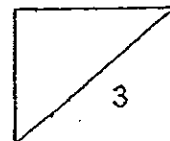


She attached three different objects, A, B and C of similar mass to the spring coil (by fastening them to a piece of cardboard using some tape) one at a time and recorded her observations as shown below.

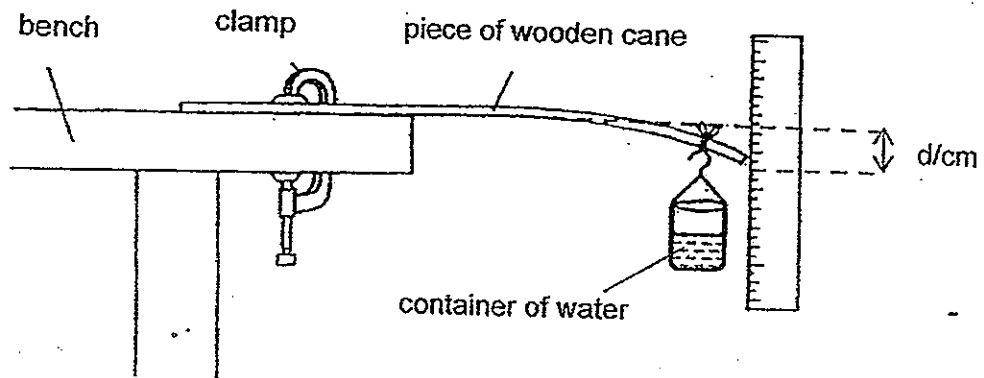
Object	Observation
A	The length of the spring coil increased by 2 cm.
B	The length of the spring coil decreased by 2 cm.
C	The length of the spring coil increased by 4 cm.

(a) What force is acting on the spring when the spring coil increases in its length? [1]

(b) Based on the experiment, explain why the length of the spring changes as different objects were attached to the cardboard. [2]



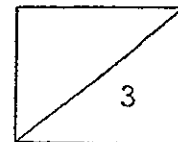
39. Colin set up an experiment with the following apparatus and left them in a warm and windy place in the classroom.



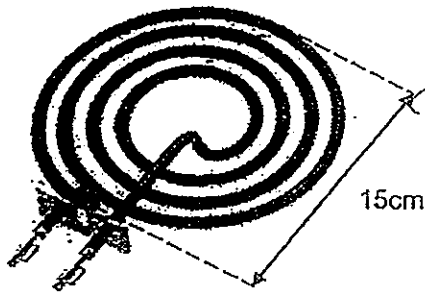
He started the experiment with 300ml of water in a glass beaker. He recorded the amount of water left in the beaker as well as the difference in the height between the table top and the end of the wooden cane, d , over a period of time.

- (a) What is the relationship between distance d and amount of water as shown in the above experiment? [1]

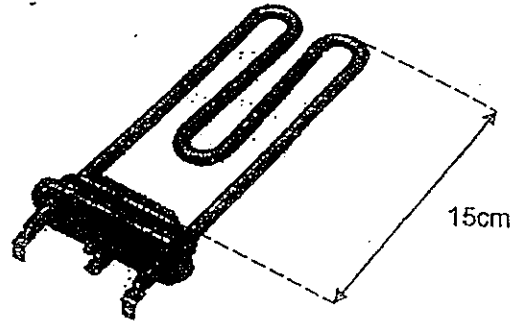
- (b) Explain clearly the changes in d over time. [2]



40. The diagram shows the top view of 2 similar sized electrical heating element made from the same material.

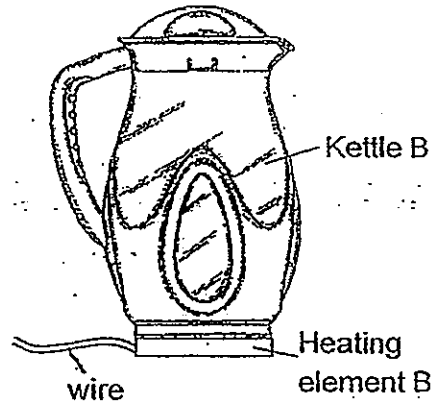
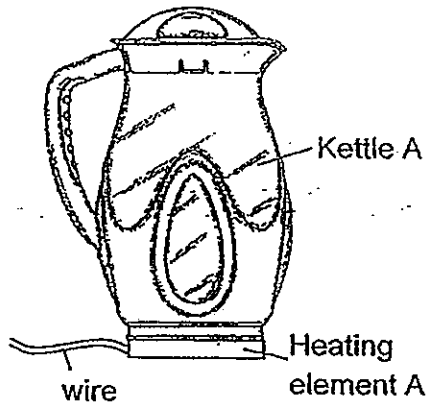


Heating element A



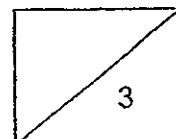
Heating element B

The diagrams below show the position of the heating element in two identical kettles and the time taken for water in each kettle to boil was recorded

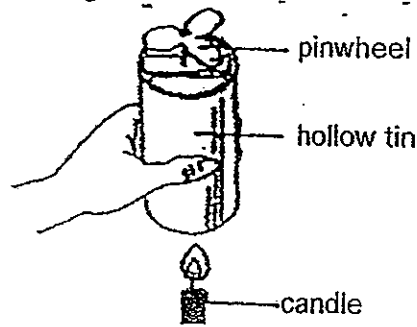


- (a) Based on the diagram above, what is the aim of the experiment? [1]

- (b) Based on the diagrams above, what is the difference between the boiling time of Kettle A and Kettle B? Explain your answer clearly. [2]



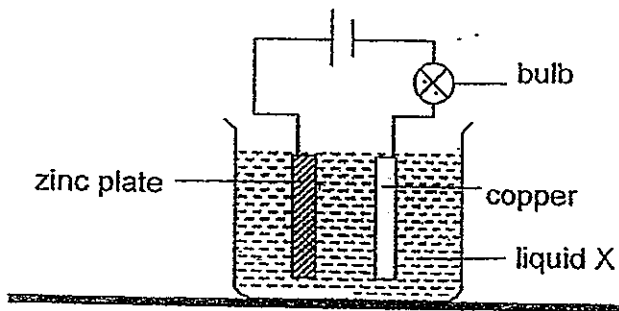
41. Four children set up an experiment as shown in the diagram below. They attached a pinwheel on a hollow tin and then placed a lighted candle below the tin.



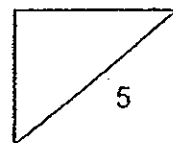
- (a) Explain clearly what will be observed. [2]

- (b) What will happen if more candles are added in the set-up? [1]

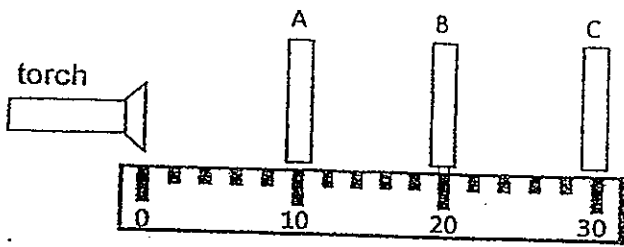
42. Dave set up an electrical circuit as shown below. He found that the bulb lit up.



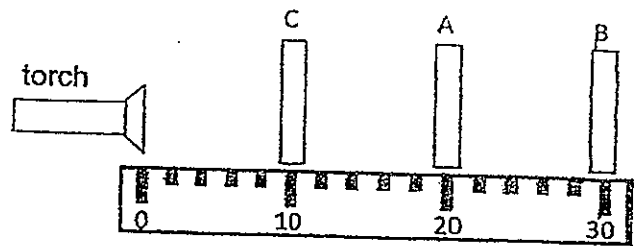
- Describe the correct conversion of energy that has taken place in the above set-up [2]



43. An experiment was conducted to investigate whether light can pass through three sheets, A, B and C that were made of different materials. The sheets were arranged in two set-ups X and Y as shown below.

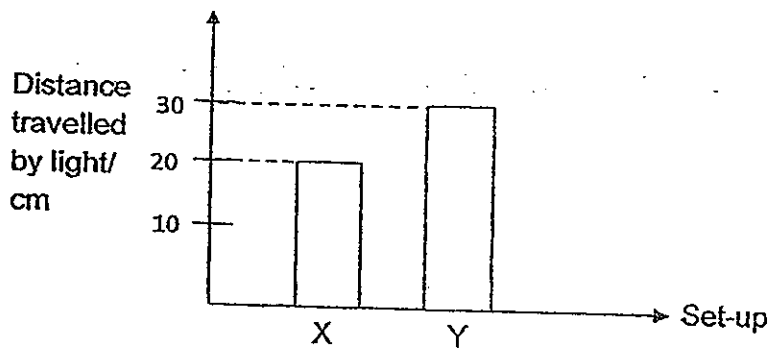


Set-up X



Set-up Y

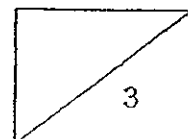
The distance travelled by the light for each set-up was measured and the results are shown in the graph below.



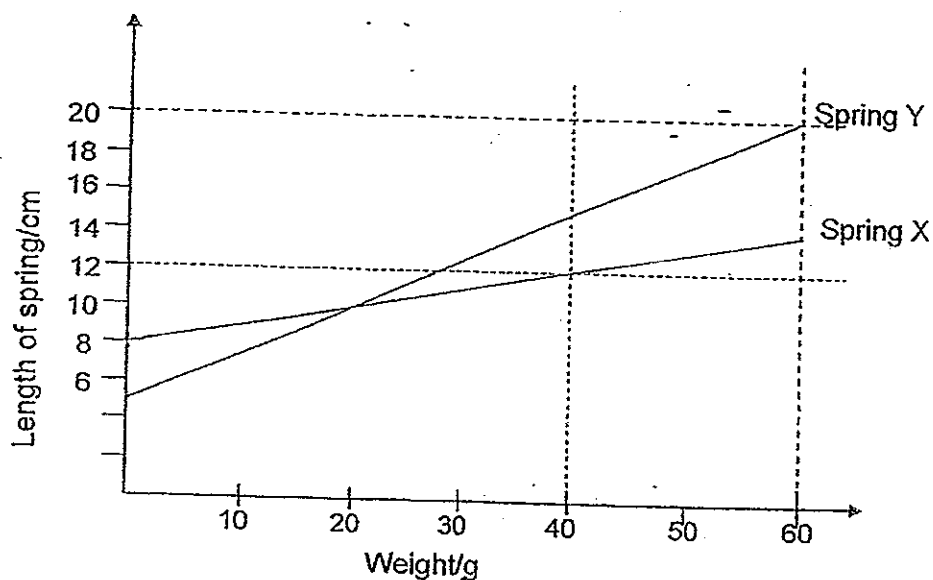
- (a) Which of the above sheet(s) allow light to pass through? [1]

- (b) What happens when B is placed at 10cm? [1]

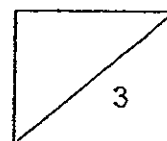
- (c) What can you conclude about materials A, B and C? [1]

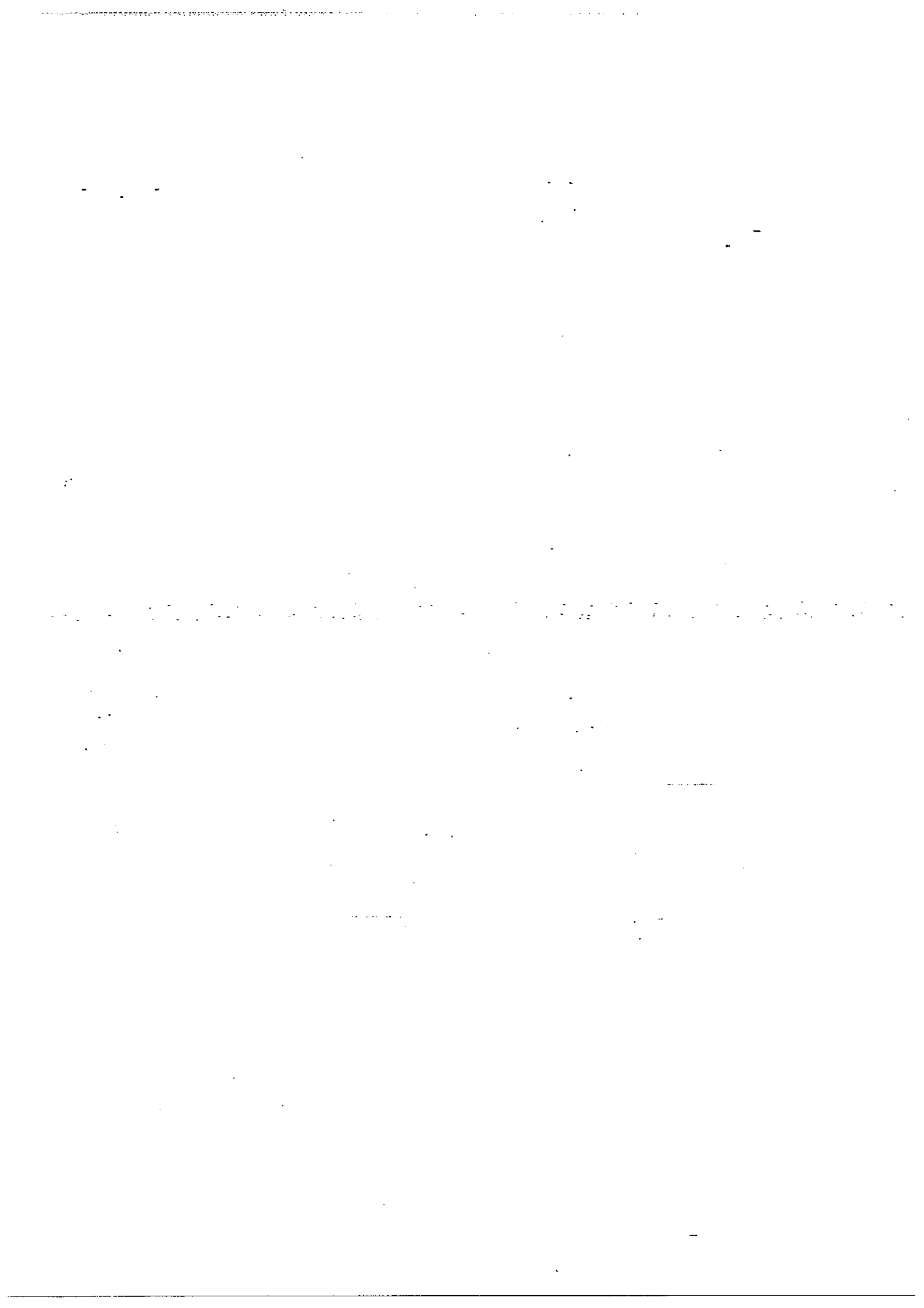


44. The graph below shows the length of two springs X and Y when different weights were hung on them.



- (a) Which spring was longer? [0.5]
-
- (b) The springs were of the same length when a _____ weight was hung [1]
- (c) Which spring was more elastic? [0.5]
-
- (d) Explain your answer to (c) above. [1]
-





Catholic High School
 Preliminary Examination One (2012)
 Answer Key for P6 Science

1)	3	6)	4	11)	4	16)	4	21)	2	26)	1
2)	1	7)	4	12)	1	17)	2	22)	1	26)	2
3)	2	8)	3	13)	2	18)	2	23)	4	28)	2
4)	3	9)	3	14)	4	19)	3	24)	3	29)	3
5)	2	10)	3	15)	2	20)	1	25)	2	30)	4

31. (a) Can it fly?
 (b) Animal A has legs, can fly and does not have two pairs of wings.
 (c) The ant has legs while the snail does not have legs.

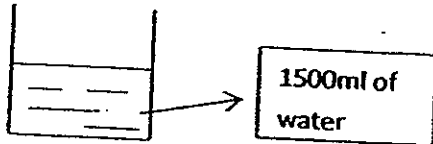
32. (a) A – Wind
 B – Animals/Insects
 (b) A – The anthers are dangling/taller than the petal ($\frac{1}{2}$ m) for the wind to blow them away ($\frac{1}{2}$ m).
 B – The anthers are shorter than the stigma/petals ($\frac{1}{2}$ m) so that the pollen grains will stick to the animal when it gets nectar ($\frac{1}{2}$ m).

33. (a) X: Sperms
 Y: Ovule
 (b) Nucleus of male sex cell fuses with the nucleus of the female sex cell.

34. (a) Plant A lost lesser water than Plant B ($\frac{1}{2}$ m) as most of its stomata is covered with oil, reducing the loss of water.

(b) 250ml

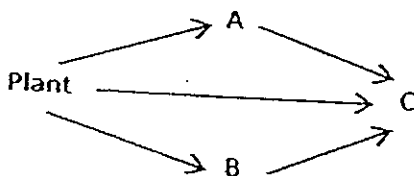
(c)



- (d) Put a layer of oil into the beakers of both set-ups.

35. (a) Line DE
 (b) Most of the digested food has been absorbed into the bloodstream.

36. (a)



- (b) They provide oxygen and food.
 (c) The fish waste acts as fertilisers for the plant.

37. (a) To find out whether different coloured light affects the rate of photosynthesis.
(b) So that there would not be light from other sources interfering in the experiment.
(c) A clear filter acts as a control ($\frac{1}{2}m$) to show by comparison that the colour of the light/only the colour of the light affect the rate of photosynthesis ($\frac{1}{2}m$).
38. (a) Magnetic force of attraction.
(b) The length of the spring coil increases as objects A and C are magnetic and are attracted by the strong magnet (1m). The length for object B decreases as object B is a magnet and is repelled by the magnet (1m).
39. (a) The lesser the amount of water, the shorter the distance d.
(b) When some water evaporates over time, the amount of water decreases and so does its weight, so it becomes lighter and there would be less stress on the piece of wooden cane, so the distance d would decrease over time.
40. (a) The aim is to find out how will the different exposed surface areas of the heating element can affect the time taken for the water in the kettle to boil.
(b) Kettle A heats up faster as the heating element has a greater surface area of contact with the base of the kettle than kettle B and hence more heat can be transferred/gain more heat/emit more heat to the kettle of water.
41. (a) The air above the candle is heated/gain heat and expands/rises through the hollow tin to cause the pinwheel to spin.
(b) The pinwheel would spin faster.
42. Chemical potential energy from the battery \longrightarrow electrical energy \longrightarrow light energy + heat energy from the bulb
43. (a) A and C
(b) No light would be able to pass through.
(c) B is opaque while C and A are transparent.
44. (a) X
(b) 20g
(c) Y
(d) It extends more when the same mass of more than 20g is hung on it.