

**NANYANG PRIMARY SCHOOL**

**PRIMARY 6 SCIENCE**

**PRELIMINARY EXAMINATION**

**2015**

**BOOKLET A**

**Date : 27 August 2015**

**Duration : 1 h 45 min**

**Name : \_\_\_\_\_ (     )**

**Class: Primary 6 (     )**

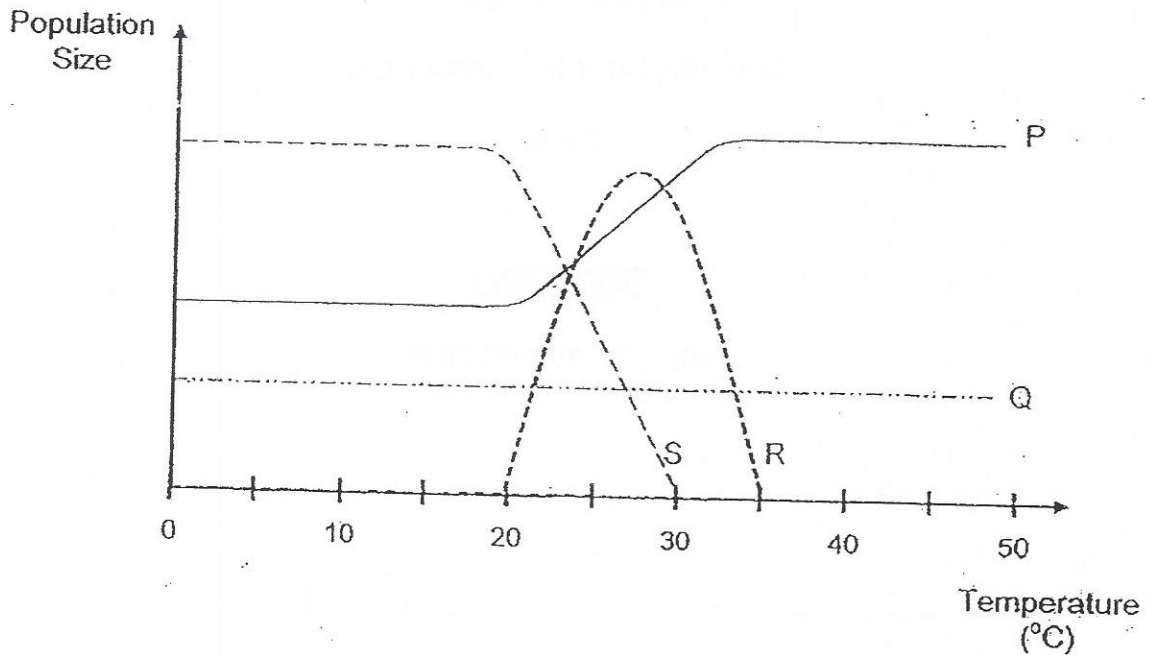
**DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.  
FOLLOW ALL INSTRUCTIONS CAREFULLY.**

**Booklet A consists of 24 printed pages including this cover page.**

**Section A (30 x 2 marks = 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). Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet provided.

1. The graph below shows the effect of temperature of the environment on the populations of 4 different organisms. P, Q, R and S.

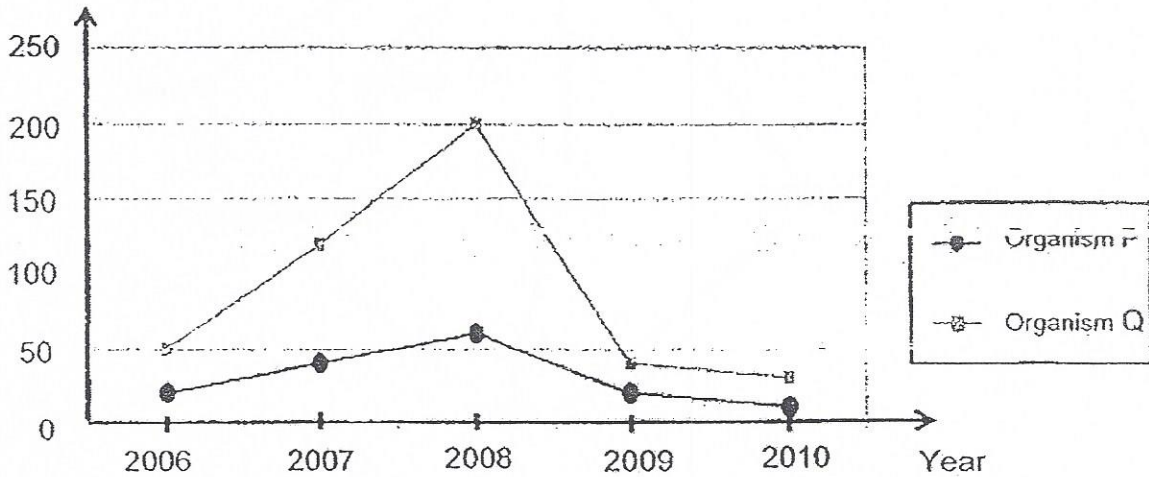


Which one of the following statements is correct?

- (1) Both organisms R and S survive best at 20°C.
- (2) Organism Q is not affected by temperature change.
- (3) Organism P survives better when the temperature is below 30°C.
- (4) Organism S is the most sensitive to temperature change as compared to other organisms.

2. Some scientists conducted a study on two types of organisms, P and Q, which were found in a community. The graph below shows how the number of organisms changed over time.

Number of organisms



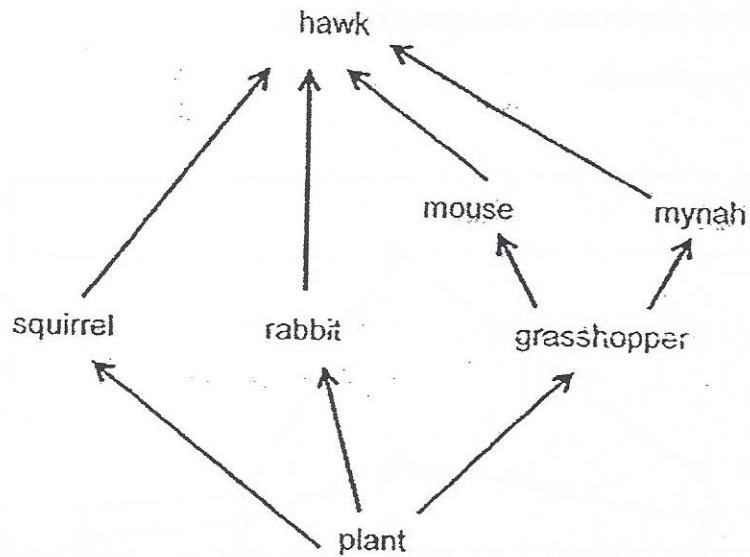
Based only on the information from the graph above, the scientists wrote the following statements.

|           |  |
|-----------|--|
| Daniel    | The number of P and Q was the highest in 2008.   |
| Andrew    | The population of Q increased more than the population of P between 2006 and 2008.                                       |
| Thaddeus  | The decrease in the number of P and Q from 2008 to 2010 could be due to P preying on Q.                                  |
| Creighton | The introduction of a prey into the community caused the sudden decrease in the population of P and Q from 2008 to 2009. |

Which of the following scientists made the correct statements?

- (1) Andrew and Daniel only
- (2) Daniel and Thaddeus only
- (3) Andrew and Creighton only
- (4) Creighton and Thaddeus only

3. Study the food web below.



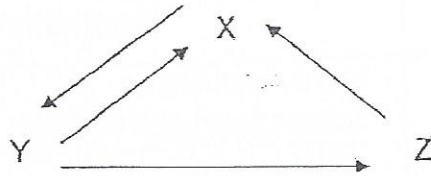
Which of the following statements are true about the food web?

|   |   |
|---|---|
| A | There are only 2 organisms which are both a prey and a predator.                                |
| B | The hawks feed on more mice than mynahs.  |
| C | The population of rabbits is only affected by the population of plants.                         |
| D | When the population of plants decreases, the populations of other organisms would decrease too. |

- (1) A and D only  
 (3) C and D only

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

4. The letters, X, Y and Z, represent 3 organisms in a community while the arrows show the direction of the flow of energy.



Which one of the following represents X, Y and Z in this community?

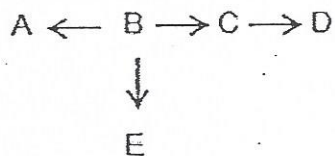
|     | X           | Y           | Z           |
|-----|-------------|-------------|-------------|
| (1) | producers   | decomposers | consumers   |
| (2) | producers   | consumers   | deccmposers |
| (3) | consumers   | decomposers | producers   |
| (4) | decomposers | producers   | consumers   |

5. In order to reduce the population of C within a short period of time, the following is done to the habitat.

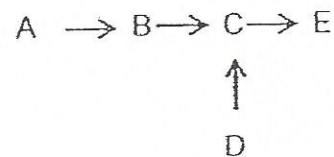
- Introduce more organism B.
- Introduce more organism E.
- Reduce the number of organism A

Which one of the following shows the food relationships of organisms A, B, C, D and E?

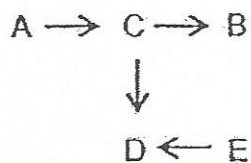
(1)



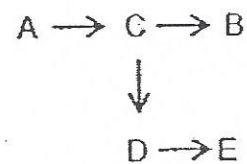
(2)



(3)



(4)



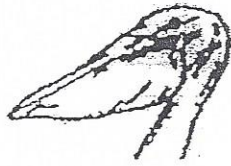
6. The table below provides some information on three different types of organisms K, L and M.

| Organism | Information  |
|----------|--|
| K        | - has a weak stem<br>- flowers pollinated by birds |
| L        | - walks on sand<br>- breathes on land and in water |
| M        | - feeds on small animals<br>- hunts only at night  |

Which one of the following shows the correct adaptations of organisms K, L and M based only on the information given?

|     | Organism K  | Organism L   | Organism M                                     |
|-----|---|--|--|
| (1) | - has climbing stems<br>- presence of nectar            | - has thin, pointed legs<br>- presence of gills and gill chamber | - has sharp claws<br>- has good night vision   |
| (2) | - has climbing stems<br>- absence of nectar             | - has padded feet<br>- presence of lungs                         | - has a curved beak<br>- has good night vision |
| (3) | - has thorns on stem<br>- has brightly-coloured flowers | - has thin, pointed legs<br>- has moist skin                     | - has sharp claws<br>- has streamlined body    |
| (4) | - has clasping roots<br>- has brightly-coloured flowers | - has padded feet<br>- presence of lungs                         | - has a curved beak<br>- has hollow bones      |

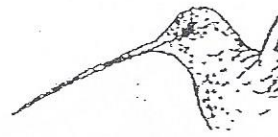
7. The diagrams below show the different types of beak and feet that birds have to help them survive in different environments.



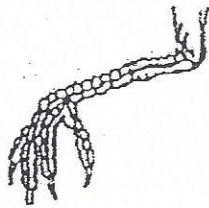
A



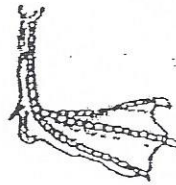
B



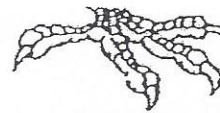
C



D



E

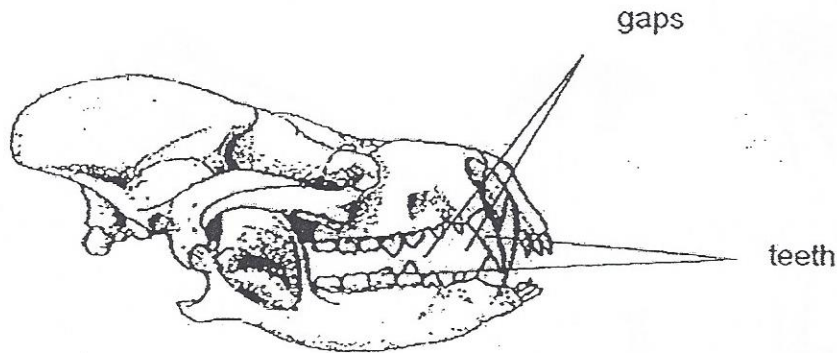


F

Which one of the following beaks and feet is correctly matched to the diet of the bird and the type of habitat where it is found?

|     | Beak | Foot | Diet of the bird | Habitat |
|-----|------|------|------------------|---------|
| (1) | A    | D    | Fruit            | Aquatic |
| (2) | B    | E    | Grains           | Land    |
| (3) | C    | F    | Nectar           | Land    |
| (4) | A    | F    | Meat             | Aquatic |

8. Matthew discovered a skull as shown below. He examined the skull and concluded that the animal fed on both plants and animals.

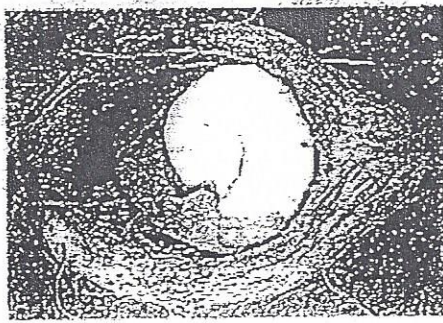


Which one of the following observations enabled Matthew to arrive at his conclusion?

- (1) There are many teeth.
  - (2) There are two pairs of big and razor-like teeth.
  - (3) There are both blunt teeth and sharp, pointed teeth.
  - (4) There are huge gaps between the two rows of teeth.
9. Which one of the following statements below shows the structural adaptation of an earthworm?
- (1) An earthworm has strong muscles that surround each body segment.
  - (2) An earthworm releases mucus to help it slide through the soil quickly.
  - (3) An earthworm can twist around wildly in an attempt to free itself from its predator.
  - (4) An earthworm stays beneath the soil surface in the day to hide from its predator.



10. Study the fruit shown below.



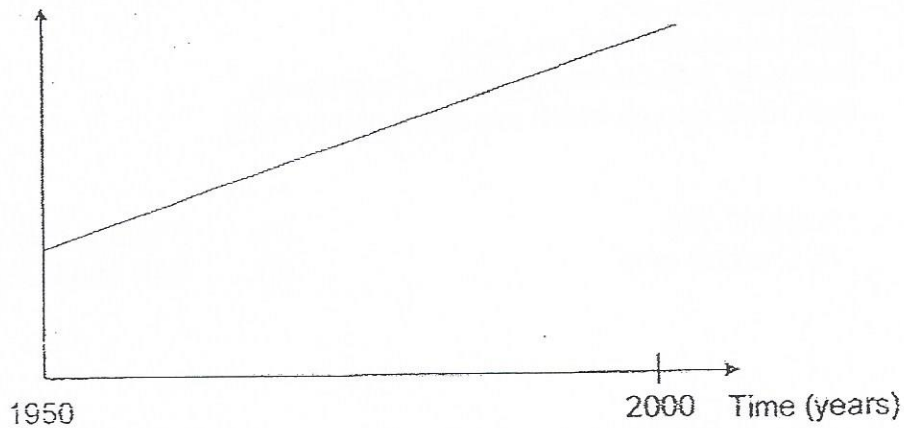
fibrous husk

Which of the following explains how the fruit is adapted for dispersal?

- (1) The fruit splits open easily.
- (2) The husk hooks onto the fur of other animals.
- (3) The fruit traps air so that it can be carried by the wind.
- (4) The husk traps air so that the fruit can stay afloat on water.

11. The graph below shows the changes in the temperature of the surroundings in a particular place over a period of time.

Temperature of surroundings ( $^{\circ}\text{C}$ )



Based on the graph above, which of the following activities could have contributed to the change in temperature?

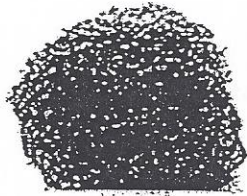
- A An increased number of forest fires.
- B More recycling activities were conducted.
- C An increased number of vehicles on the road.

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

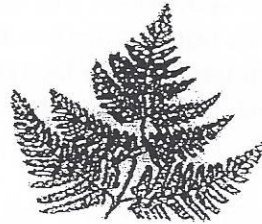
12. Shoppers are strongly encouraged to use fewer plastic bags. Which one of the following statements does not explain why fewer plastic bags should be used?

- (1) They can be recycled.
- (2) They are not easily broken down.
- (3) They released toxic fumes into the air during burning.
- (4) They caused suffocation to animals when disposed into a habitat.

13. The diagrams below show a moss and a fern.



moss



fern

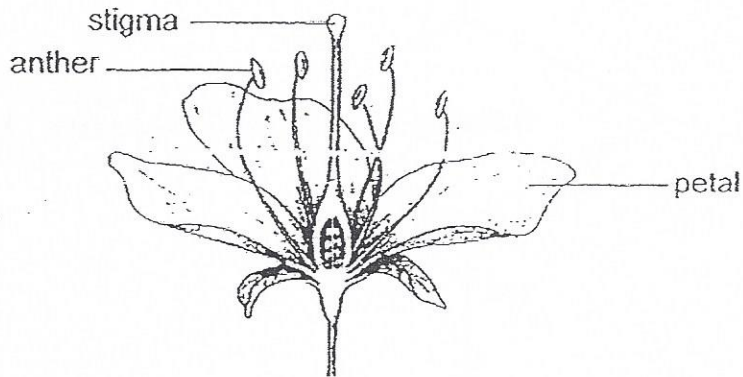
Which of the following statements correctly explain the similarities between a fern and a moss?

- A Both have flowers.
- B Both can make their own food.
- C Both help in the decomposition of organisms.
- D Both have spores which are dispersed by wind.

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

14. Ali wanted to find out which part of the flower of plant X affected the development of its fruit. The flower had both male and female parts. He selected four similar flowers from the same plant and named them, A, B, C and D, respectively. He removed different parts from each flower.

Ali then transferred some pollen grains from another flower of the same plant to flowers A, B, C and D.



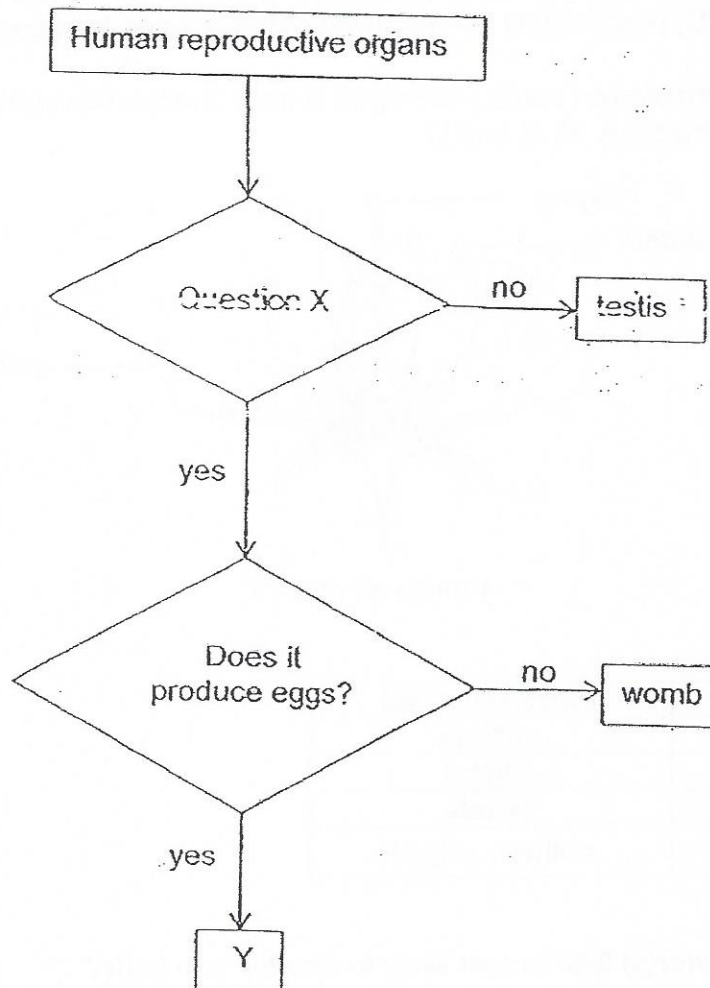
Flower of plant X

| Flower | Parts removed   |
|--------|-----------------|
| A      | anthers         |
| B      | stigma          |
| C      | petals          |
| D      | anthers, stigma |

Which flower(s) is/are most likely to develop into fruits?

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

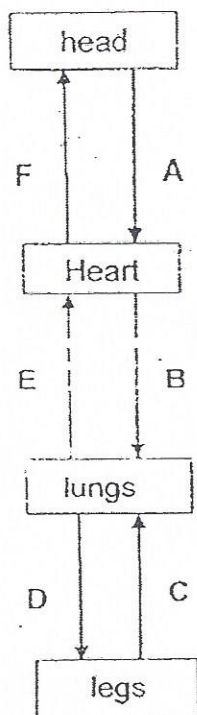
15. Study the flow chart below.



Which one of the following is correct?

|     | Question X              | Y     |
|-----|-------------------------|-------|
| (1) | Is it found in males?   | ovule |
| (2) | Is it found in males?   | ovary |
| (3) | Is it found in females? | ovary |
| (4) | Is it found in females? | ovule |

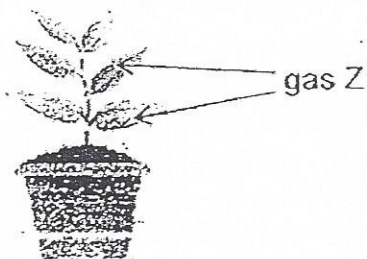
16. Peter drew a diagram to show the blood flow in a human. His teacher commented that there were some arrows which were drawn incorrectly.



Which of the above arrows were drawn correctly to show the flow of blood?

- (1) C, D, E and F  
 (2) A, B, C and F  
 (3) B, C, D and E  
 (4) A, B, E and F.

17. A pot of plant was placed in a dark room.

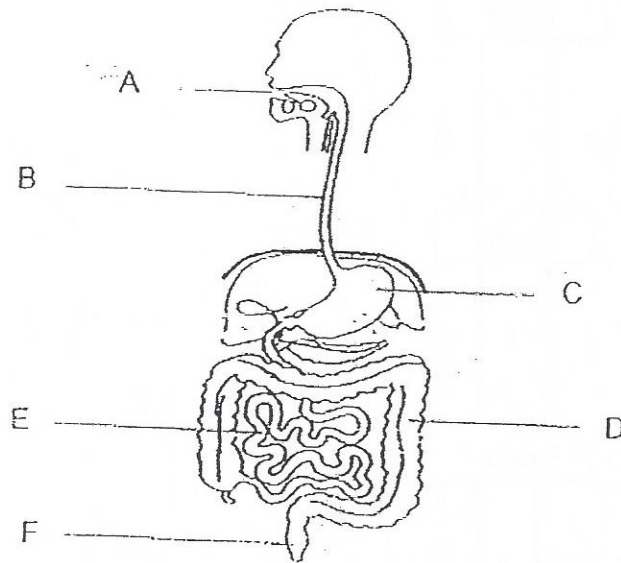


The plant went through a process, Y, and gas Z entered the leaves of the plant during this process.

Which one of the following correctly identifies process Y and gas Z?

|     | Process Y      | Gas Z          |
|-----|----------------|----------------|
| (1) | photosynthesis | oxygen         |
| (2) | photosynthesis | carbon dioxide |
| (3) | respiration    | oxygen         |
| (4) | respiration    | carbon dioxide |

18. The diagram below shows a human digestive system with some parts labelled A, B, C, D, E and F.



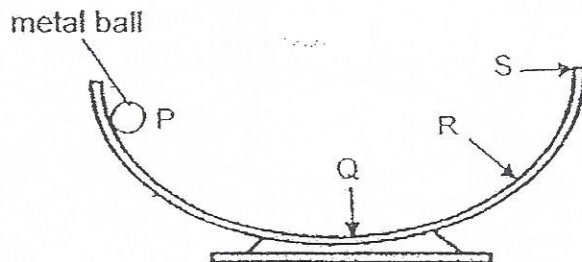
Joven, Yanti, Wallace and Meiqi each made a statement about the state of the food found at A, B, C, D, E and F.

|         |   |
|---------|---|
| Joven   | No digestion takes place here.                                    |
| Wallace | Most of the water from the food is absorbed here.                 |
| Meiqi   | A large amount of the food is broken into smaller pieces.         |
| Yanti   | The undigested food found here has the least amount of nutrients. |

Which one of the following correctly matches the labelled parts of the digestive system to each of the above statements?

|     | Joven | Wallace | Meiqi | Yanti |
|-----|-------|---------|-------|-------|
| (1) | A     | C       | D     | B     |
| (2) | B     | D       | A     | F     |
| (3) | D     | F       | E     | C     |
| (4) | F     | D       | E     | A     |

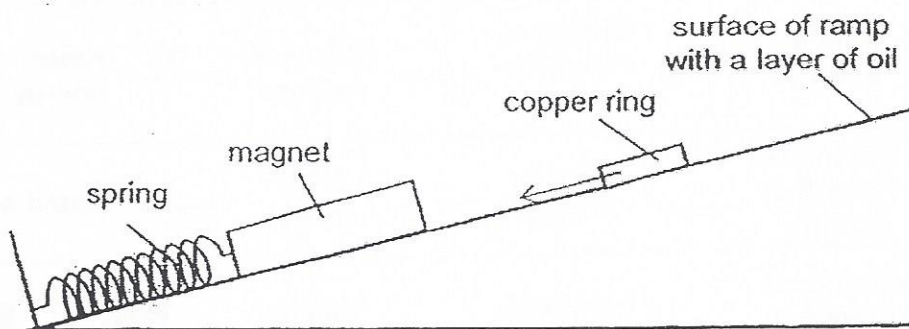
19. The diagram below shows a round glass bowl. A metal ball was held at point P. When the ball was released, it rolled down. The metal ball rolled to R and then rolled back. After some time, it stopped moving.



Which one of the following is correct when the metal ball rolled from P to R?

|     | Gravitational potential energy |          | Kinetic energy |          |
|-----|--------------------------------|----------|----------------|----------|
|     | P to Q                         | Q to R   | P to Q         | Q to R   |
| (1) | decrease                       | increase | increase       | increase |
| (2) | decrease                       | increase | increase       | decrease |
| (3) | decrease                       | decrease | increase       | increase |
| (4) | increase                       | decrease | decrease       | increase |

20. Vladimir attached a strong magnet to a spring and placed it at the bottom of a ramp. He added oil to the surface of the ramp and placed a copper ring at the top of the ramp. He then observed that the ring moved towards the magnet as shown below.

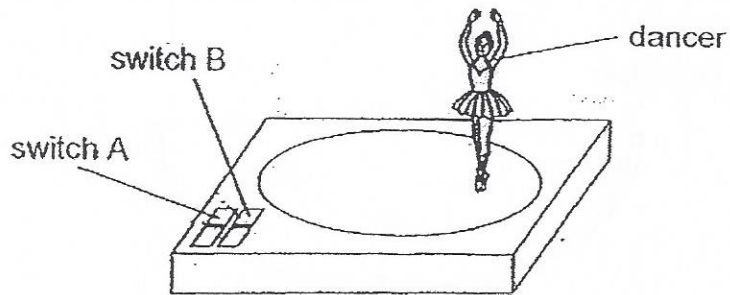


Based on the information above, what were the forces acting on the copper ring as it moved along the ramp?

- A Magnetic force
- B Frictional force
- C Gravitational force
- D Elastic spring force

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

21. The diagram below shows a toy which was bought by Sally. The toy is battery-operated.



Sally made some observations on the toy.

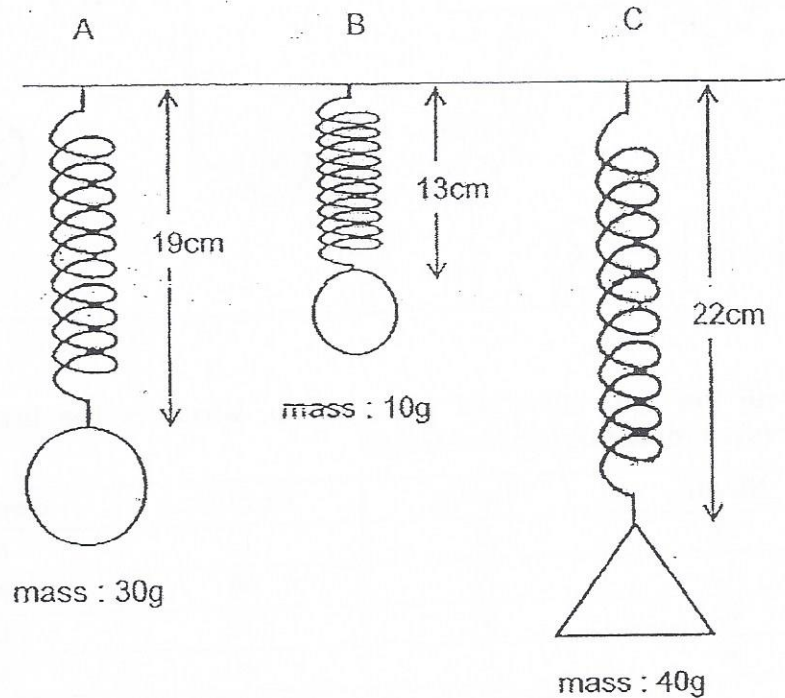
| Switched on  | Observation                                 |
|--------------|---|
| A only       | The dancer did not move.<br>There was music |
| B only       | The dancer moved.<br>There was no music     |
| Both A and B | The dancer moved.<br>There was music.       |

Which one of the following shows the correct energy conversions of the toy after both A and B are switched on?

|     |   |
|-----|---|
| (1) | Kinetic energy → Chemical Potential energy → Electrical energy → Kinetic energy             |
| (2) | Chemical Potential energy → Kinetic energy → Heat energy → Sound energy                     |
| (3) | Chemical Potential energy → Electrical energy → Kinetic energy + Heat energy + Sound energy |
| (4) | Kinetic energy → Chemical potential energy → Electrical energy → Sound energy + Heat energy |



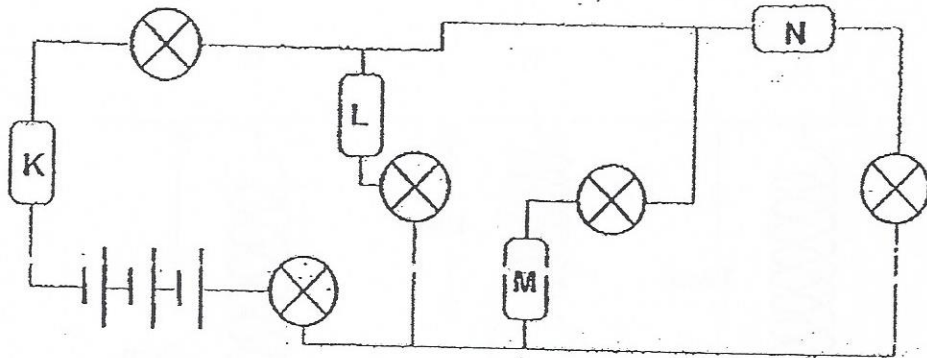
22. Loads of different mass and shape are hung on three similar springs, A, B and C. The original length of each spring was 10cm. The diagram below shows the new length of each spring with different loads.



Based on the information given, which one of the following statements about the set-ups is false?

- (1) Spring B exerted less elastic spring force than spring C.
- (2) The shape of the load affected the extension of each spring.
- (3) If the mass of the load was 50g, the new length of each spring would be 25cm.
- (4) The load attached to spring A exerted more pulling force than the load attached to spring B.

23. Four objects, K, L, M and N, that were made of different materials were placed at different parts of the electrical circuit as shown below.



Given that all the light bulbs did not light up, which of the following combination(s) of materials is/are correct?

|   | Silver | Plastic | Rubber | Copper |
|---|--------|---------|--------|--------|
| A | M      | N       | L      | K      |
| B | L      | K       | M      | N      |
| C | N      | M       | K      | L      |
| D | K      | L       | N      | M      |

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

24. Four metal pins, W, X, Y and Z, were fixed onto a cardboard as shown in Figure 1 below. Figure 2 shows a circuit tester consisting of a battery and a bulb connected to two wires, A and B.

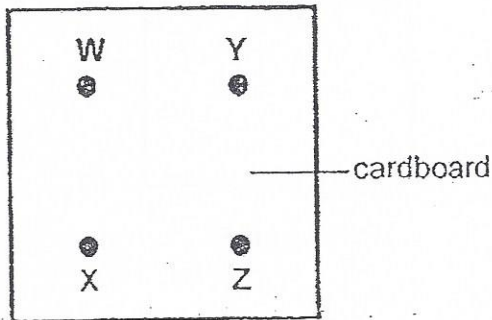


Figure 1

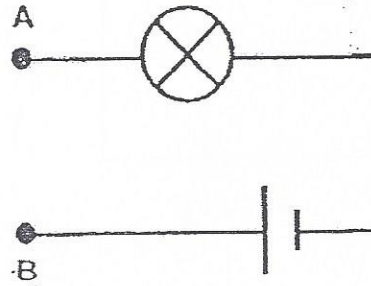
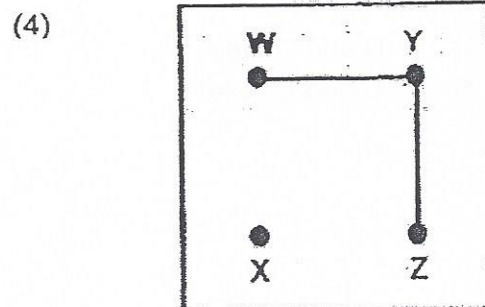
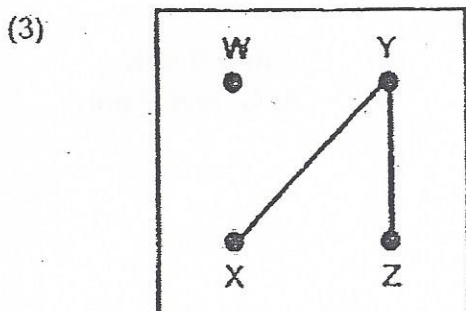
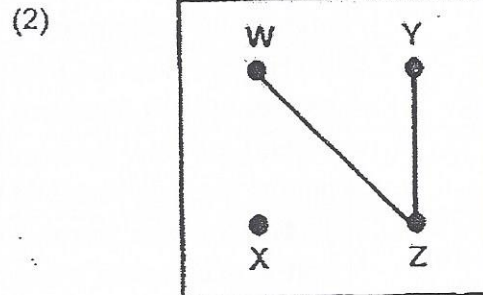
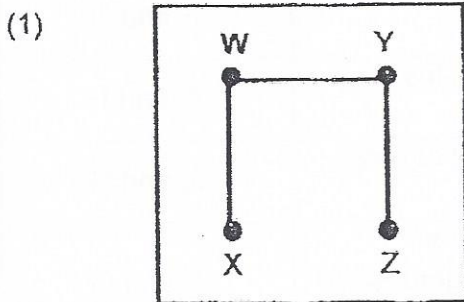


Figure 2

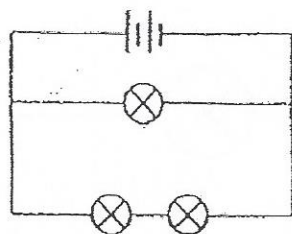
Zubair placed the 2 ends of the circuit tester to different pairs of pins on the circuit card. He recorded the results in the table shown below.

| Pin connected to A | Pin connected to B | Did the bulb light up? |
|--------------------|--------------------|------------------------|
| W                  | X                  | No                     |
| X                  | Y                  | Yes                    |
| Y                  | Z                  | Yes                    |
| Z                  | W                  | No                     |

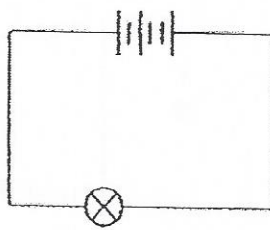
Based on his results above, which one of the following shows the correct arrangement of the wires in the circuit card?



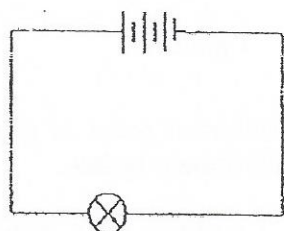
25. Miguel set up four electrical circuits as shown below.



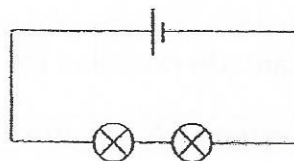
Circuit E



Circuit F



Circuit G



Circuit H

Which of the following experimental set-ups, A, B, C and D, correctly pairs the experimental aim to the circuits selected?

| Set-ups | Experimental aim   | Circuits |
|---------|--|----------|
| A       | To find out how the number of bulbs affects the brightness of the bulb.                    | F and H  |
| B       | To find out how the number of bulbs affects the brightness of the bulb.                    | G and H  |
| C       | To find out how the arrangement of bulbs affects the brightness of the bulb.               | E and H  |
| D       | To find out how the arrangement of batteries in series affects the brightness of the bulb. | F and G  |

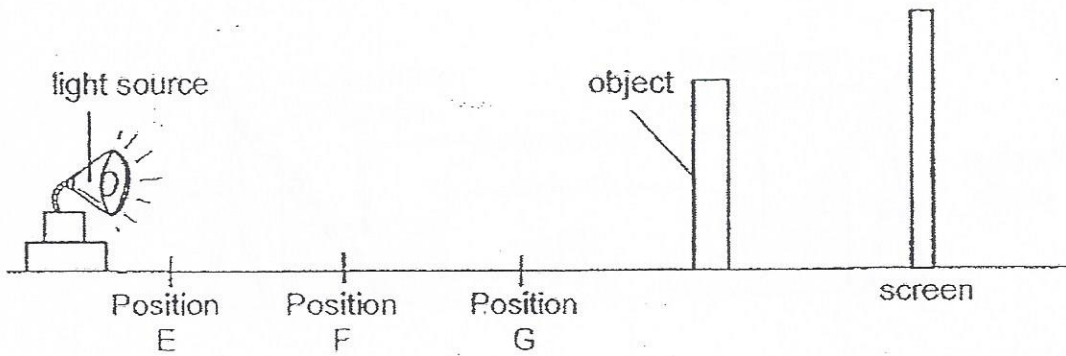
(1) B and C only

(3) C and D only

(2) A and D only

(4) A, C, and D only

26. Naveen used the set-up shown below to find out how the distance between an object and a light source affected the height of the shadow.

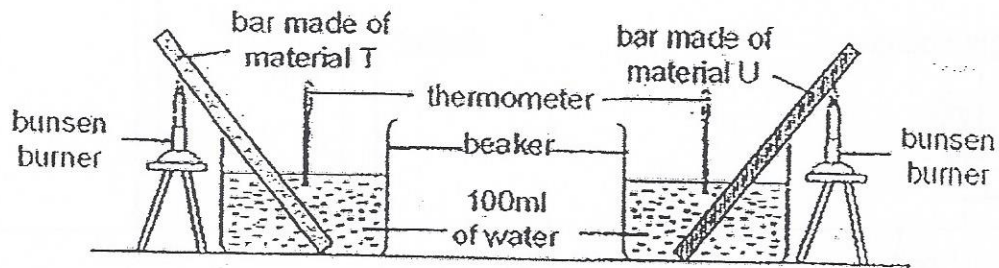


He placed the light source at different positions, E, F and G, and measured the respective heights of the shadow cast on the screen.

Which one of the following most likely shows the height of the shadow formed?

| Height of shadow formed (cm) |            |            |
|------------------------------|------------|------------|
| Position E                   | Position F | Position G |
| (1) 21                       | 13         | 5          |
| (2) 21                       | 5          | 13         |
| (3) 5                        | 13         | 21         |
| (4) 5                        | 21         | 13         |

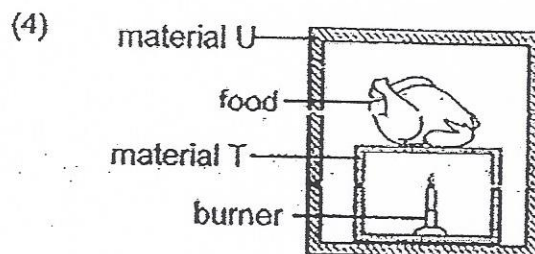
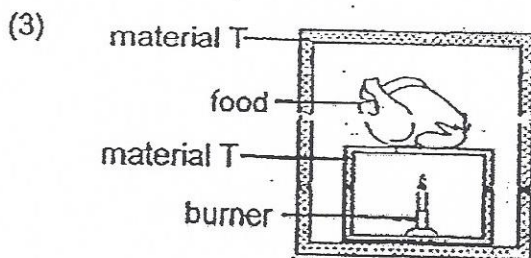
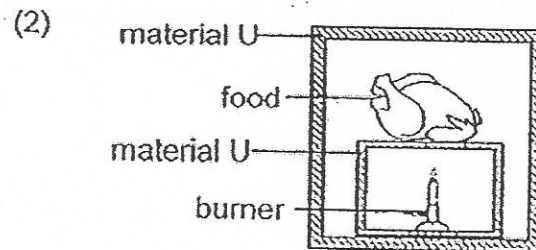
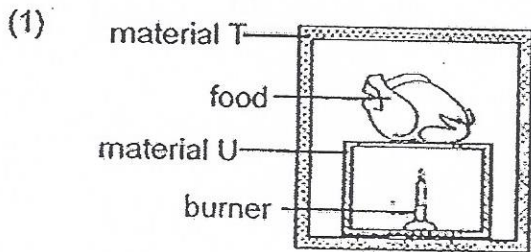
27. Ismail used the set-up shown below to find out how the material of a bar affected the temperature of water.



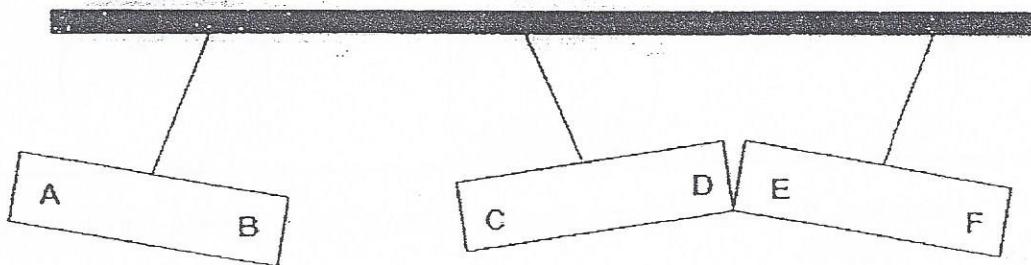
He heated up both bars for five minutes and recorded the temperature of the water in the beakers as shown in the table below.

| Material | Initial temperature of water ( $^{\circ}\text{C}$ ) | Final temperature of water ( $^{\circ}\text{C}$ ) |
|----------|---|---|
| T        | 25  | 32  |
| U        | 25  | 26  |

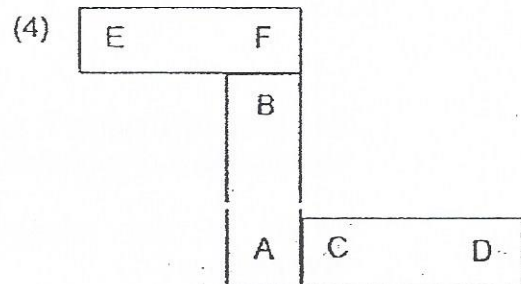
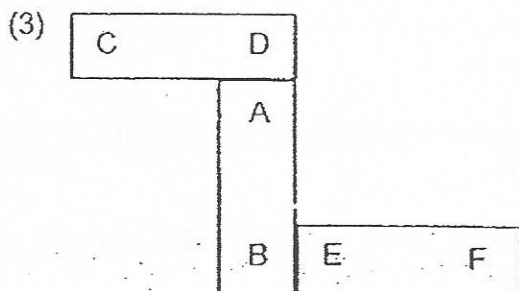
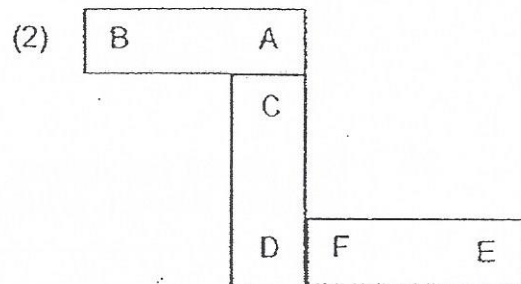
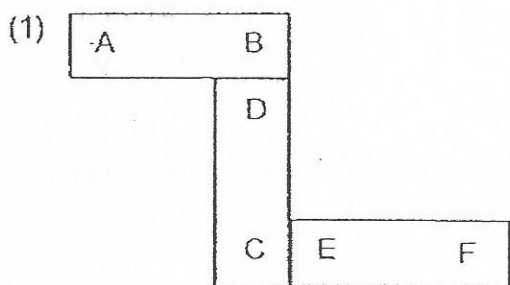
He then used both materials to make a container for keeping food warm. Which one of the following containers will keep food warm for the longest time?



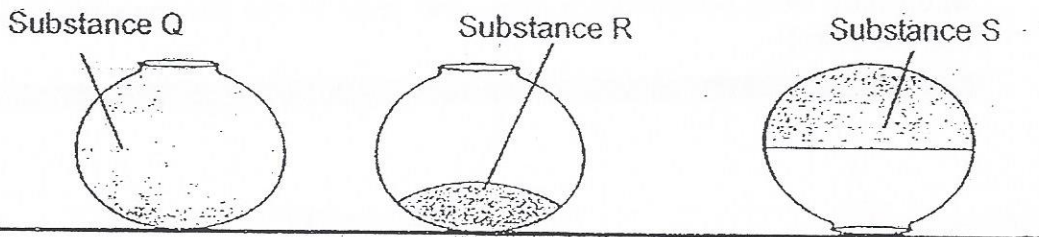
30. The diagram below shows what happened to 3 identical bar magnets when they were hung from a pole. The ends of the bar magnets are marked A to F.



Which one of the following diagrams shows a possible arrangement of the three magnets?



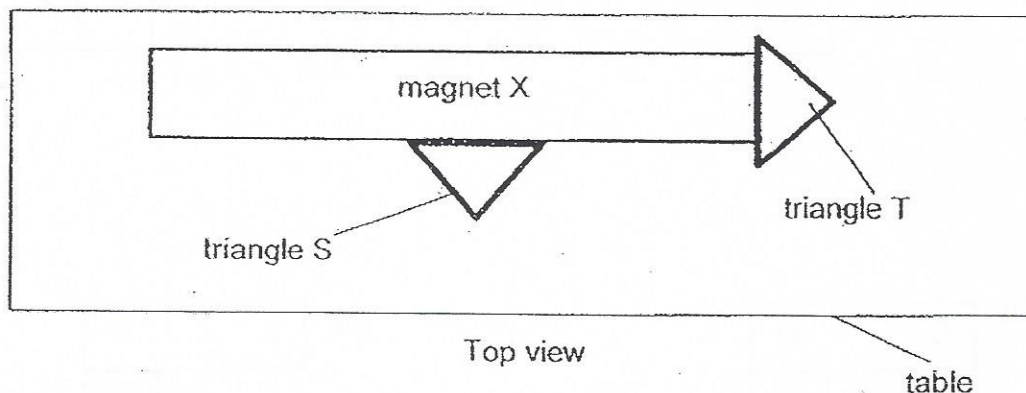
28. Thomas added three different substances, Q, R and S, into three similar containers as shown below.



Based on the observations above, which of the following conclusions are correct?

|   |                                     |
|---|-------------------------------------|
| A | Q can only be a gas.                |
| B | R and S cannot be compressed.       |
| C | Q and S must have a definite shape. |

- (1) A only  
 (2) B only  
 (3) A and B only  
 (4) B and C only
29. Ben placed bar magnet X on a table. He then attached two similar triangles, S and T, to magnet X as shown below.

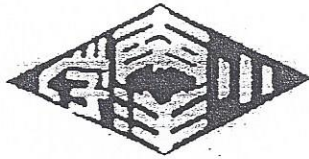


Ben lifted up magnet X and observed that triangle T remained attached but triangle S dropped off after a while.

Which of the following statements best explain the above observations?

- A Triangle S is made of magnetic material.  
 B Triangle T is attracted to the poles of the magnet X.  
 C Only the poles of magnet X have magnetic force of attraction.
- (1) B only  
 (2) C only  
 (3) A and B only  
 (4) A and C only





**NANYANG PRIMARY SCHOOL**

**PRIMARY 6 SCIENCE  
PRELIMINARY EXAMINATION**

**2015**

**BOOKLET B**

**Date : 27 August 2015**

**Duration : 1 h 45 min**

**Name : \_\_\_\_\_ (     )**

**Class: Primary 6 (     )**

**Marks Scored:**

|                    |  |            |
|--------------------|--|------------|
| <b>Booklet A:</b>  |  | <b>60</b>  |
| <b>Booklet B :</b> |  | <b>40</b>  |
| <b>Total :</b>     |  | <b>100</b> |

**Any query on marks awarded should be raised by 8 September 2015. We seek your understanding in this matter as any delay in the confirmation of marks will lead to delays in the generation of results.**

**Parent's signature: .....**

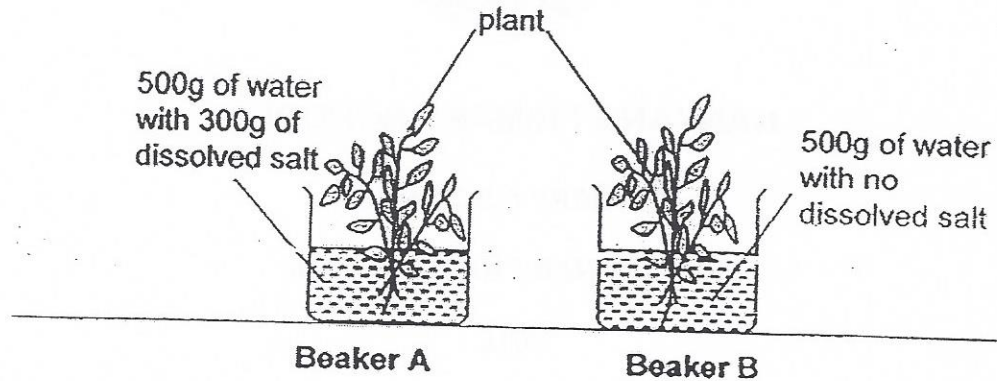
**DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.  
FOLLOW ALL INSTRUCTIONS CAREFULLY.**

**Booklet B consists of 18 printed pages including this cover page.**

**Section B (40 marks)**

Write your answers to questions 31 to 44 in the spaces provided.

31. The following experiment was conducted as shown below.



Both beakers with similar plants were placed by the window and the number of leaves was observed and counted over 2 weeks.

(a) What was the aim of the experiment?

[1]

The following table shows the results of the experiment.

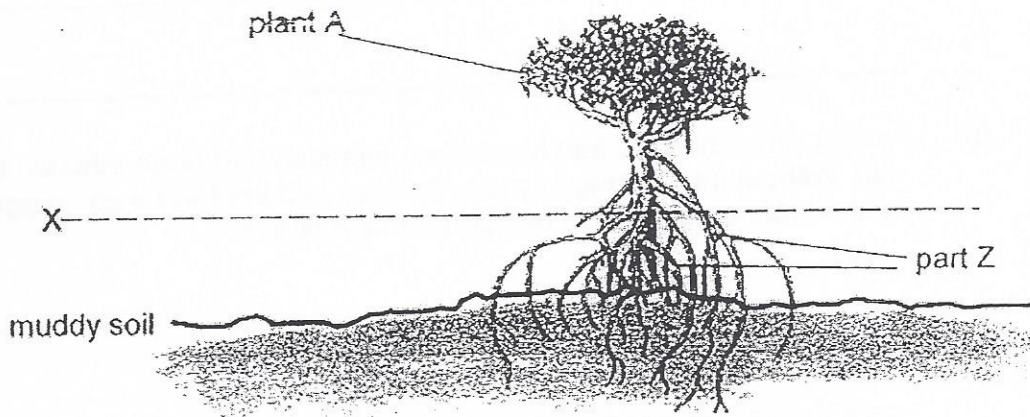
|        | Plant in Beaker A |                  | Plant in Beaker B |                  |
|--------|-------------------|------------------|-------------------|------------------|
|        | Number of leaves  | Colour of leaves | Number of leaves  | Colour of leaves |
| Day 1  | 22                | Green            | 22                | Green            |
| Day 3  | 23                | Green            | 22                | Green            |
| Day 5  | 23                | Green            | 24                | Green            |
| Day 7  | 20                | Light Green      | 25                | Green            |
| Day 9  | 18                | Light Green      | 25                | Green            |
| Day 11 | 15                | Yellow           | 26                | Green            |
| Day 14 | 12                | Yellow           | 26                | Green            |

(b) What conclusion can be made from the results of the experiment? [1]

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The following diagram shows plant A that is found at the seashore.



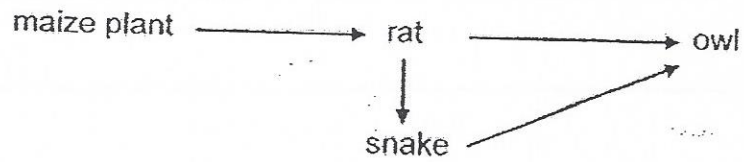
Line X shows the height of seawater during high tide. Plant A has an adaptation marked part Z to help it to adapt to the rise and fall of tides by keeping the trunk above X.

(c) What is another function of Part Z that helps Plant A to adapt to its habitat? [1]

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32. Study the food web below.



- (a) Based on the above food web, identify the organism which is both a prey and a predator. Explain your choice. [1]

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- (b) Farmer Amos noticed that his maize plantation had been infested by rats. Without introducing any new species into the food web, suggest a method that can help him overcome this problem. [1]

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- (c) The following year, Farmer Amos noticed a drastic decrease in the population of the owls. State two possible reasons for this occurrence. [1]

(i)

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(ii)

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---

33. The caterpillar of butterfly X releases a sweet substance which will attract ants. The ants feed on this sweet substance. The ants also fight off attacks from other insects that feed on the caterpillar.

(a) How do the caterpillar and the ants benefit from this relationship? [1]

(i) Benefit for the caterpillar:

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(ii) Benefit for the ants:

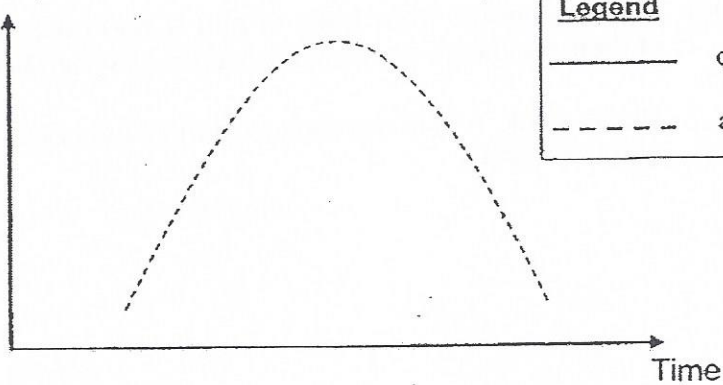
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(b) The graph below shows how the population of ants changes over a period of time.

Using the legend provided in the box, draw on the same graph how the population of caterpillars changes over time. [1]

Number of organisms



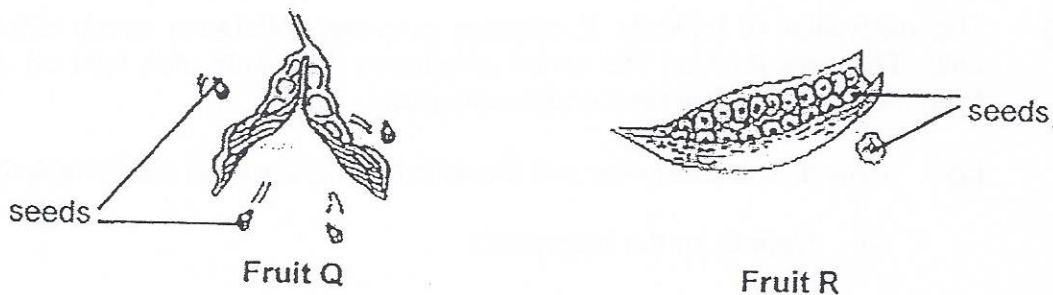
(c) Based only on the information provided, explain how the population of caterpillars would be affected if a disease struck and killed most of the ants. [1]

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34. The diagram below shows two different kinds of fruits, Q and R.



Bala made some observations on the seeds from both fruits and recorded them in the table shown.

| Seeds from fruit Q | Seeds from fruit R           |
|--------------------|------------------------------|
| small and hard     | light with transparent wings |

(a) Based on the information above, explain how fruit R dispersed its seeds. [2]

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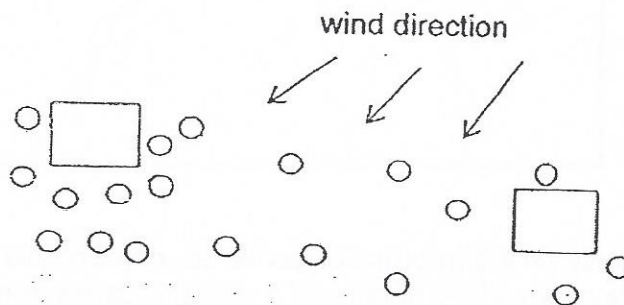
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(b)(i) After the seeds from fruits Q and R had been dispersed, the positions of their seedlings are indicated in the diagram below.

Place a tick (✓) in one box to identify the correct position of the parent plant of fruit Q. [1]



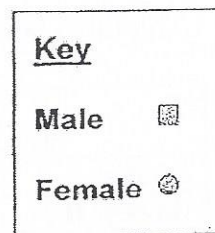
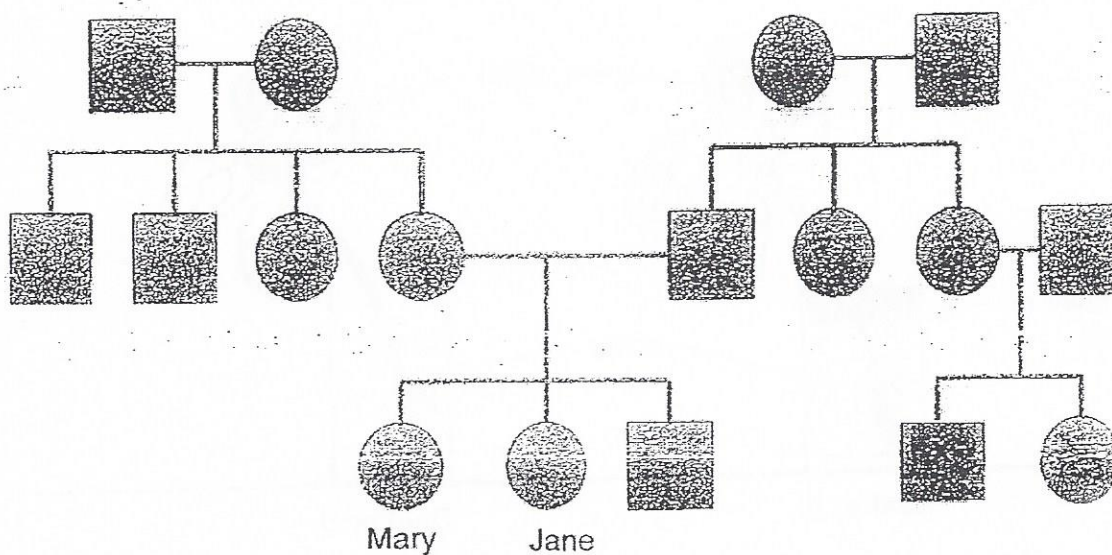
(ii) Explain your choice in (b)(i). [1]

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35. Study the family tree of a pair of twins, Jane and Mary.



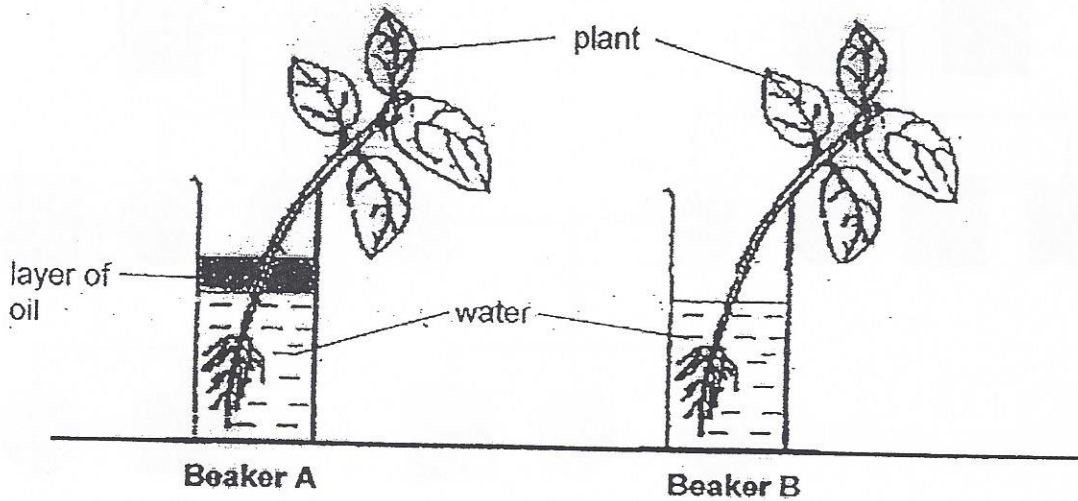
(a) State the number of generations in the family tree. [1]

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(b) How is Mary related to X? [1]

---

36. Rita conducted the experiment as shown below. Beakers A and B contained two similar plants and the same amount of water. A layer of oil was added to beaker A. The two beakers were then left in the garden for two hours.



The table below shows the results for the experiment.

|          | Volume of water at the start of experiment (ml) | Volume of water at the end of experiment (ml) |
|----------|---|---|
| Beaker A | 50  | 40  |
| Beaker B | 50  | 20  |

Based on the results above, explain the change in the volume of water in both beakers at the end of the experiment. [2]

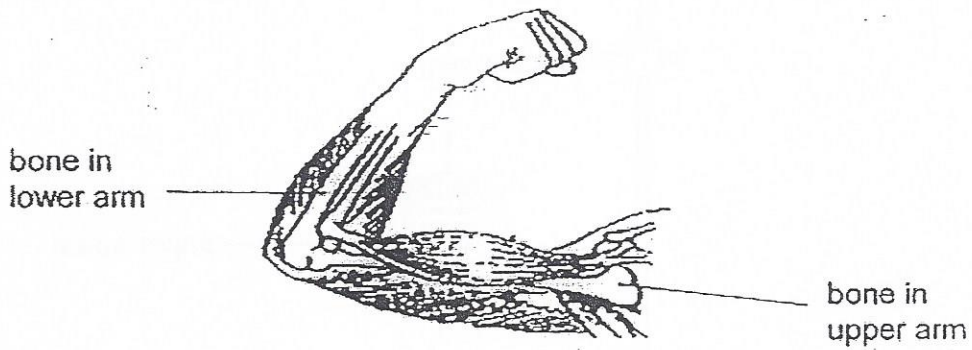
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37. The diagram below shows a human arm.



(a) Based on the diagram above, which two systems are needed to work together to straighten the arm? [1]

(i) System 1: \_\_\_\_\_

(ii) System 2: \_\_\_\_\_

(b) Explain how the circulatory system works with the two systems mentioned in (a). [2]

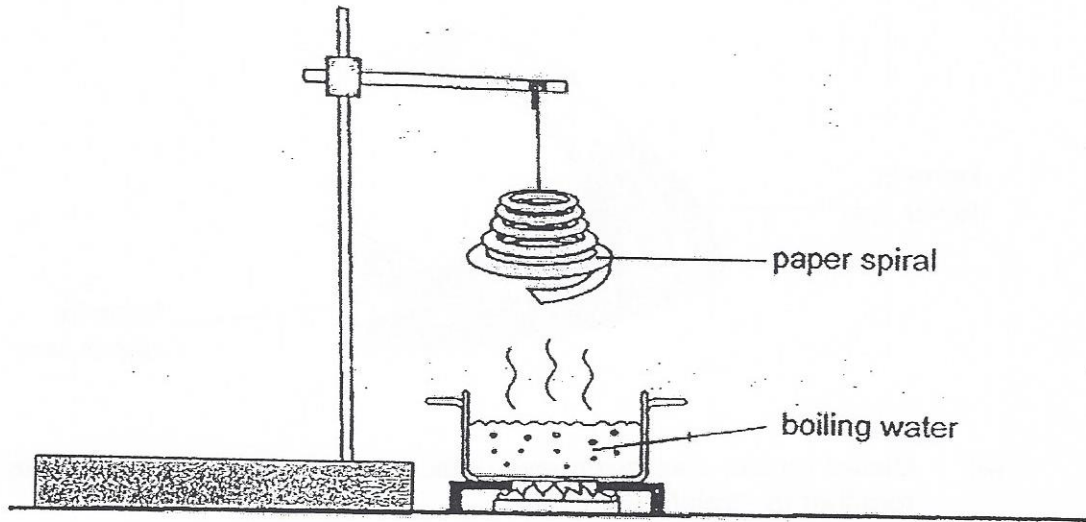
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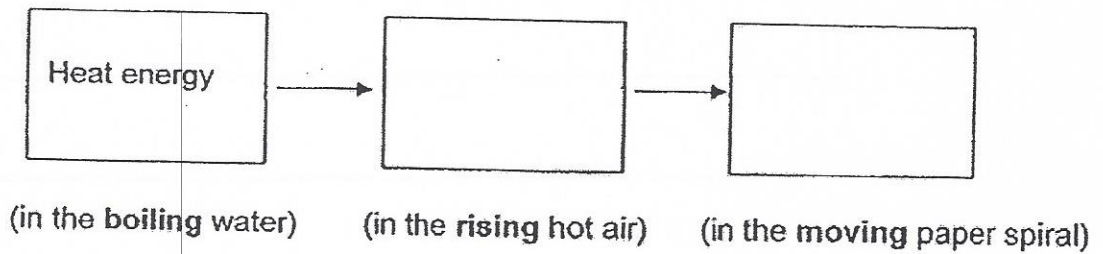
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38. Mary conducted an experiment as shown in the diagram below.



A paper spiral was hung above the pot of boiling water. After some time, the paper spiral started to spin.

(a) Fill in the blanks below to show the energy conversion. [1]



Mary decided to repeat the same experiment to find out how the exposed surface area of a container affected the average number of spins made by the paper spiral in one minute.

The table below showed the results.

| Exposed surface area of container (cm <sup>2</sup> ) | Average number of spins (per minute) |
|--|--------------------------------------|
| 200  | 3                                    |
| 400  | 5                                    |
| 600  | 8                                    |
| 800  | 12                                   |

- (b) Based on the results above, state how the average number of spins changed with the exposed surface area of the container. [1]

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- (c) Twenty holes were punched on the same paper spiral and the experiment was conducted again using a container with an exposed surface area of 800 cm<sup>2</sup>.

- (i) How would this change affect the average number of spins made by the paper spiral? [1]

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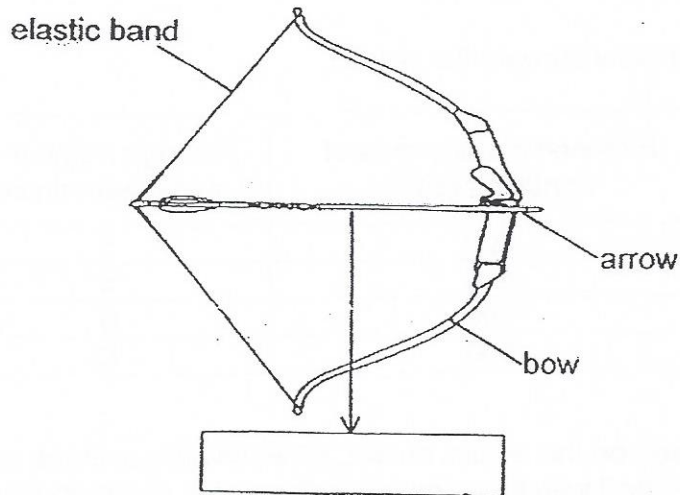
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- (ii) Explain your answer in part (i) [1]

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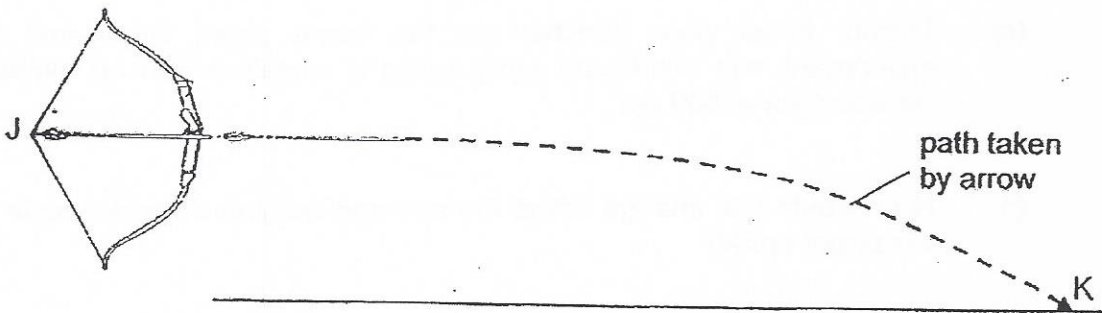
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39. The diagram below shows a bow and arrow and when the string of the bow was pulled back.



- (a) Label the force acting on the arrow in the box provided above. [1]

When the string was released, the arrow travelled in the path as shown below before hitting the ground at point K.



- (b) In terms of forces, explain the movement of the arrow from the point it was released at J till it hit the ground at K. [2]

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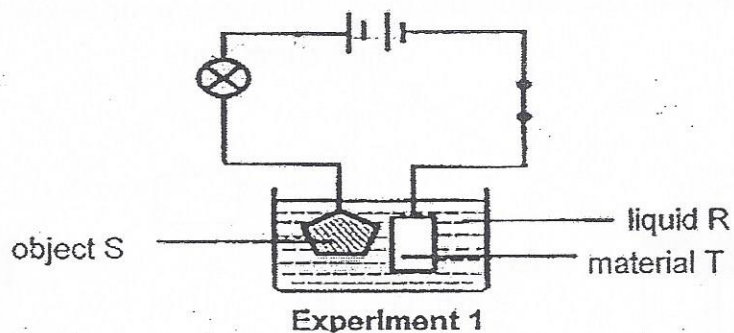
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- (c) The activity was repeated with an arrow of a greater mass. Explain how this will affect the movement of the arrow.

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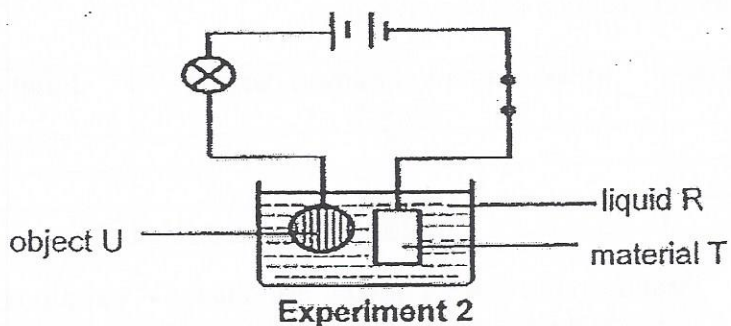
40. Song Cho carried out an experiment using the set-up as shown below.



When the switch was closed, he noted that the bulb lit up. After running the experiment for one hour, he also observed that object S was coated with a thin layer of material T.

- (a) State one common property of liquid R, object S and material T. [1]
- 

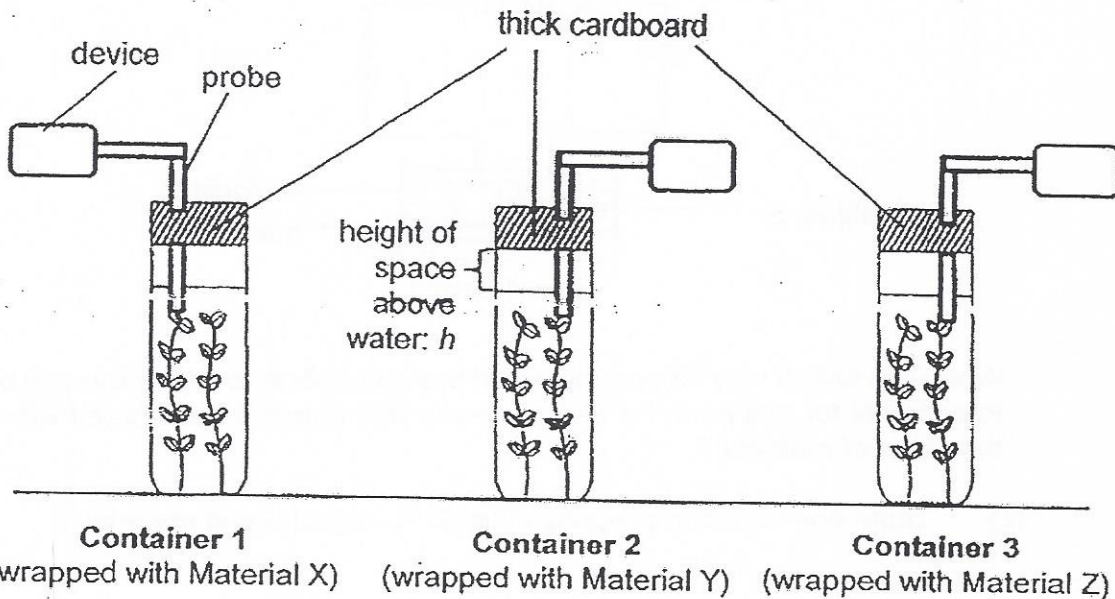
He then decided to replace object S with object U as shown below.



- (b) After conducting experiment 2 for the same duration, he observed that the bulb did not light up and that there was no layer of material T found on object U. Explain his observation. [1]
- 
- 

- (c) Suggest one modification to the set-up such that the bulb will light up. [1]
- 
-

41. Vanda wanted to find out how different materials affect the growth of a water plant. She used three similar glass containers and wrapped each container with different materials, X, Y and Z. She then covered the opening of each container with thick cardboard as shown in the set-up below.



To measure the amount of carbon dioxide present in the water, she added a probe linked to a special device into each container to measure the amount of carbon dioxide. She then left the set-ups near the window for 4 hours and obtained the results as shown below.

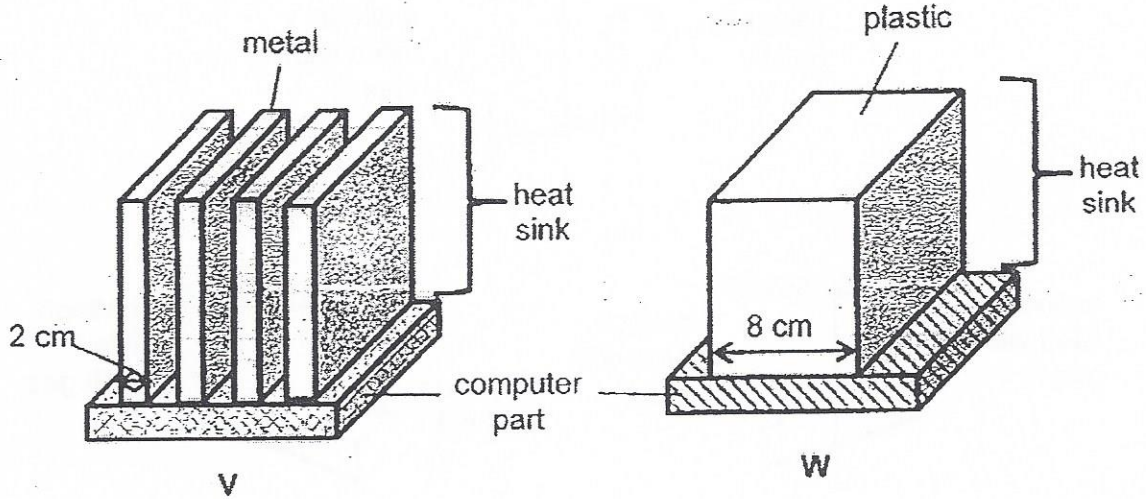
| Material | Initial amount of carbon dioxide (units) | Final amount of carbon dioxide (units) |
|----------|--|--|
| X        | 12                                       | 1                                      |
| Y        | 12                                       | 14                                     |
| Z        | 12                                       | 5                                      |

- (a) Based on the results above, put a tick (✓) in the correct column to indicate if each of the following statements is 'True' or 'False'. [2]

|       | Statement                                    | True | False |
|-------|--|------|-------|
| (i)   | Z could be made of cardboard.                |      |       |
| (ii)  | Y is most likely a translucent material.     |      |       |
| (iii) | Z allows less light to pass through than X.  |      |       |
| (iv)  | X can be used to make a windscreen of a car. |      |       |

- (b) Vanda wanted to grow fully submerged water plants in a tank. Based on the results above, which one of the above materials is best suited for making the tank? Explain your choice. [1]

42. Heat sinks are often used in computers to prevent the parts inside the computers from overheating. The diagrams below show two heat sinks, V and W.



Which one of the above heat sinks (V or W) is better at reducing overheating of the computer parts? Explain your answer. [2]

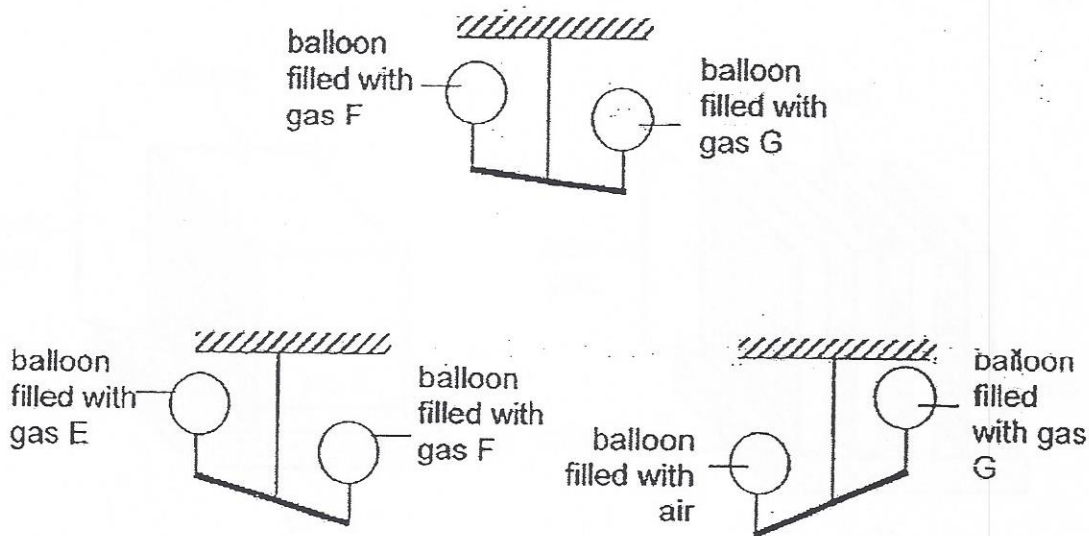
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43. Nikita used some balloons and filled each with  $200 \text{ cm}^3$  of different gases, E, F, G and air. He hung the balloons at two ends of the rod. The diagrams below show his observations.



- (a) Use the results above to rank the gases, E, F, G and air, in the table below. [1]

| Mass per $1 \text{ cm}^3$ | Greatest mass $\longrightarrow$ Smallest mass |  |  |
|---------------------------|---|--|--|
| Gas                       |   |  |  |

- (b) He then pumped another  $100 \text{ cm}^3$  of air into the balloon which was filled with air. Given that the balloon did not burst, what would be the new volume of air in the balloon? [1]

Tick (✓) the correct answer below.

- $200 \text{ cm}^3$   
  $200 \text{ cm}^3 - 300 \text{ cm}^3$   
 more than  $300 \text{ cm}^3$

Give a reason for your answer above.

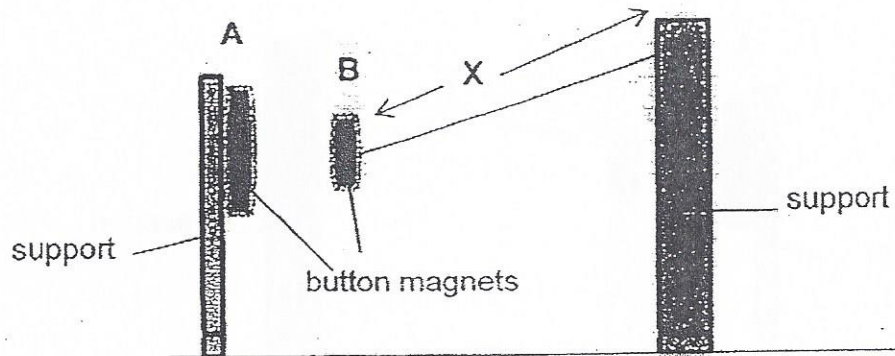
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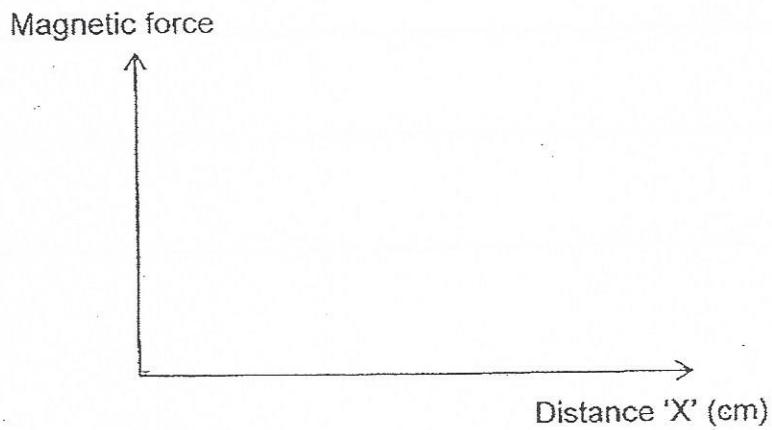


44. Study the experimental setup as shown below.

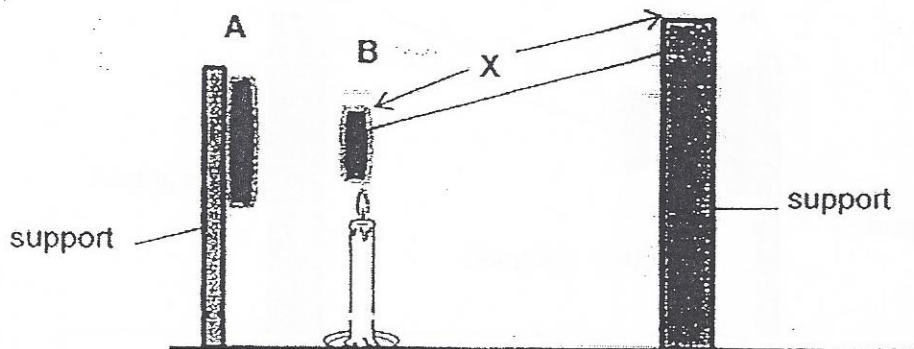


In the set-up above, 'X' is the distance of the string used to attach button magnet B to the support.

- (a) Draw a line graph to show the relationship between the magnetic force acting on B and the distance 'X'. [1]



In the set-up below, a lighted candle was placed under button magnet B so that it was heated for some time.



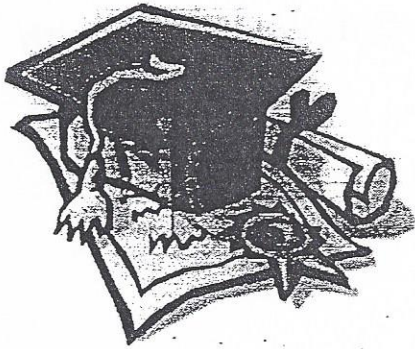
- (b) Predict what will happen to magnet B after some time. Explain your prediction.

[1]

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# ANSWER SHEET

EXAM PAPER 2015

SCHOOL : NANYANG

SUBJECT : P6 SCIENCE

TERM : SA2

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Q1  | Q2  | Q3  | Q4  | Q5  | Q6  | Q7  | Q8  | Q9  | Q10 |
| 2   | 1   | 1   | 4   | 3   | 1   | 3   | 3   | 1   | 4   |
| Q11 | Q12 | Q13 | Q14 | Q15 | Q16 | Q17 | Q18 | Q19 | Q20 |
| 2   | 1   | 2   | 2   | 3   | 4   | 3   | 2   | 2   | 2   |
| Q21 | Q22 | Q23 | Q24 | Q25 | Q26 | Q27 | Q28 | Q29 | Q30 |
| 3   | 2   | 2   | 3   | 2   | 3   | 4   | 2   | 3   | 4   |

31)a)To find out if the presence of salt affects the grow of plants.

b)Plants grown with salt will not grow well.

c)Part Z help to anchor the plant firmly to the muddy soil.

32)a)Snake. The snake prey on the rate and its predator is an owl that feeds the snake.

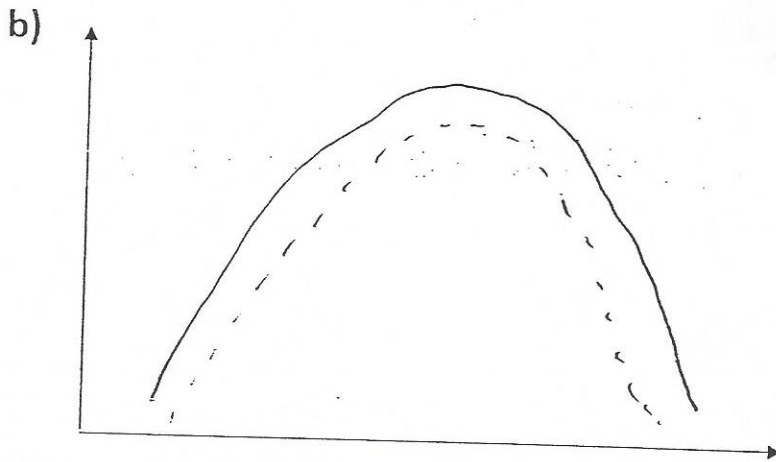
b)Increase the number of snakes as the snake feeds on the rat.

c)i)A disease out break.

ii)The snake and rat population decrease over time.

33)a)i)The caterpillar is able to survive as the ants would fight with the caterpillar's predator.

ii)Ants obtain their food from caterpillar.



c)If the ants population decrease, the ants is not able to protect the caterpillar so the predators would feed on the caterpillars making it decrease.

34)a)The fruit will split open and the seeds will be dispersed by wind.

b)i)



ii)The seedlings are scattered hear its parent plant Q.

35)a)3 generations.

b)X is Mary's cousin.

36)In beaker A, the roots had absorbed all the water leaving 40ml of water but in beaker B, the roots is able to take in the water and evaporation can take as there is no layer of oil so beaker B has lesser in the end.

37)a)i)skeletal system. ii)Muscular system.

b)It provides the muscles with oxygen and digested food so that energy can be release and carbon dioxide is removed for the arm to straighten.

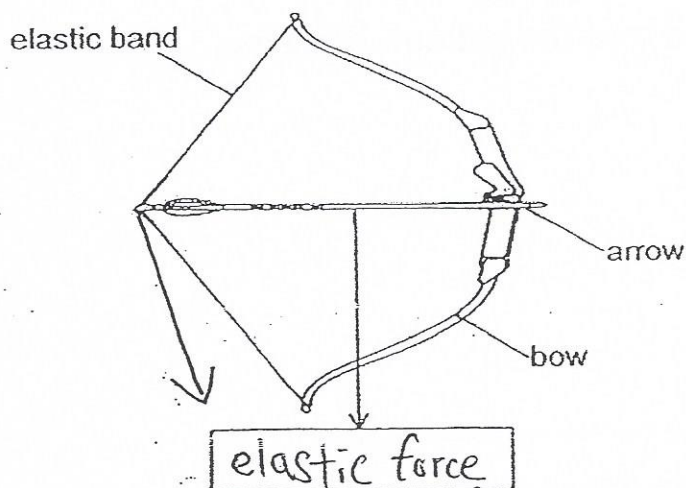
38)a)Kinetic energy  $\rightarrow$  Kinetic energy

b)With a bigger exposed surface area, the paper spiral is able to spin in the air more number of times.

c)i)The paper spiral would spins lesser than 12.

ii)The paper spiral has less surface area for the rising hot air to push.

39)a)



b)The elastic spring force exerted on the arrow coil push it for ward and the gravitational force acting on the arrow will cause it to drop.

c)The arrow will land before K as it needs more elastic spring force is the same hence the distance travelled by the arrow is shorter.

40)a) All of them are conductors of electricity.

b) U is not a conductor of electricity and there will be an open circuit.

c) Put a layer of material T around object U.

41)a) i) False    ii) False    iii) True    iv) True

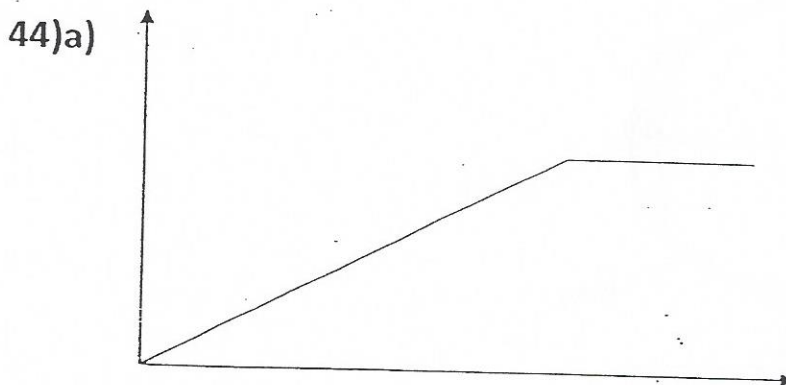
b) X. It allows the most amount of light to pass through and this will allow the plant to carry out the most amount of photosynthesis.

42) V. Metal is a better conductor of heat and V has a greater exposed surface area to lose more heat to the surroundings.

43)a) air / Gas G / Gas F / Gas E

b)  $200\text{cm}^3 - 300\text{cm}^3$

c) Air can be compressed and the balloon is elastic.



b) B remains attracted. As B is made of a magnetic material, it continues to be attracted to A even though it has already lost its magnetism.