



**AI TONG SCHOOL**

**2007 SEMESTRAL ASSESSMENT ( 2 )  
PRIMARY FIVE SCIENCE**

**DURATION: 1HR 45 MIN**

**DATE: 29 OCTOBER 2007**

**INSTRUCTIONS**

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

**Name : \_\_\_\_\_ ( )**

**Class : Primary 5 \_\_\_\_\_**

**Parent's Signature : \_\_\_\_\_**

**Date : \_\_\_\_\_**

|              |  |
|--------------|--|
| <b>Total</b> |  |
|--------------|--|

**Section A (30 x 2 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.**

1. Which one of the following statements is **not** true about the Solar system?

- (1) A satellite does not revolve around the Earth.
- (2) The Sun is the only star in the Solar System.
- (3) The Moon is nearer to the Earth than the Sun.
- (4) The Moon orbits round the Earth.

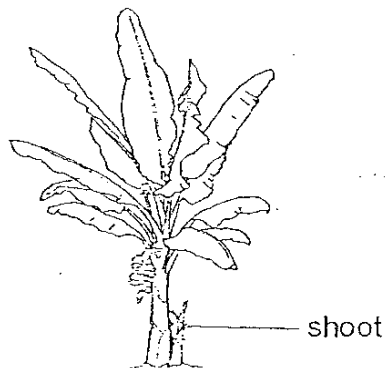
2. The table below shows a comparison of 3 kinds of cells, A, B and C.

| Parts of a cell | Cell A | Cell B | Cell C |
|-----------------|--------|--------|--------|
| Nucleus         | Yes    | Yes    | Yes    |
| Cell membrane   | Yes    | Yes    | Yes    |
| Cytoplasm       | Yes    | Yes    | Yes    |
| Chloroplast     | No     | No     | Yes    |
| Cell wall       | No     | Yes    | Yes    |

Which one of the following statements is correct?

- (1) Cell A has an irregular shape but not Cell B and Cell C.
- (2) Cell A is a plant cell but Cell B and Cell C are animal cells.
- (3) Cell A is able to reproduce but not Cell B and Cell C.
- (4) Cell A has more cells but Cell B and Cell C have fewer cells.

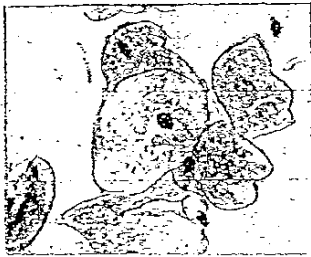
3. The picture below shows an upright shoot growing from the stem of an adult plant.



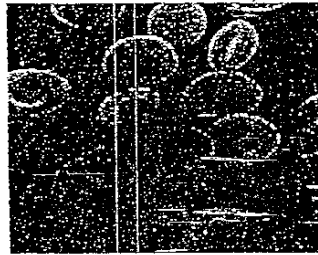
It reproduces by \_\_\_\_\_

- (1) bud
- (2) leaf
- (3) suckers
- (4) underground stem

4. The photographs below show 2 types of human cells.



Cheek cells

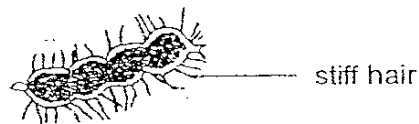


Red blood cells

Which statement(s) correctly describe(s) the differences between these types of cells?

- A: Only the cheek cells have nucleus.
  - B: Only the cheek cells have cell membrane.
  - C: Only the red blood cells **cannot** carry out cell division.
  - D: Only the red blood cells allow exchange of gases to take place.
- (1) A only  
(2) B only  
(3) A and C only  
(4) B and D only

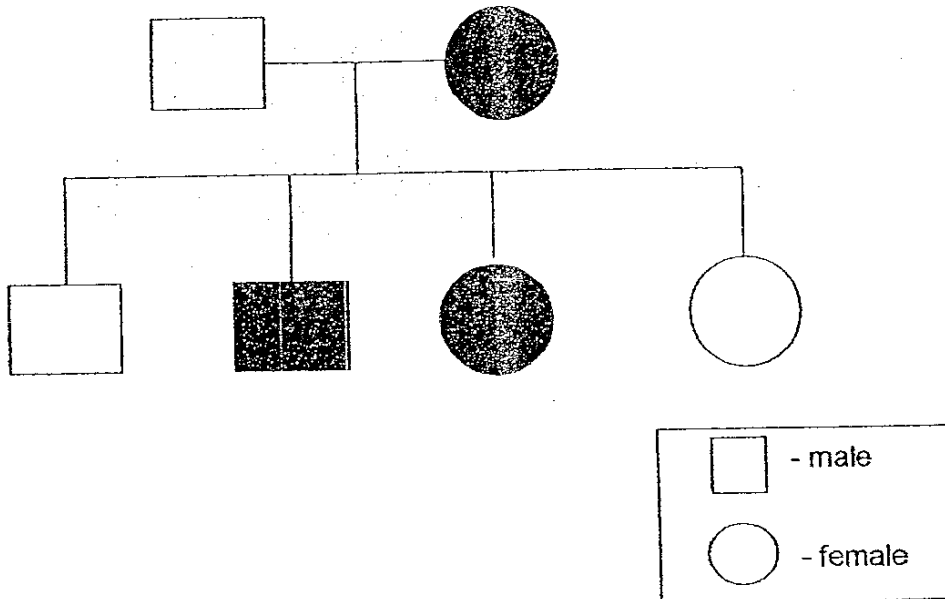
5. The diagram below shows a picture of a fruit.



Which one of the following statements best describes how it is dispersed?

- (1) Its seeds are passed out as droppings.
- (2) It sticks onto the animals' fur.
- (3) It glides in the air.
- (4) It floats on water.

6. The diagram below shows the Chew family tree.  
A shaded symbol indicates that the person is able to roll his/her tongue.

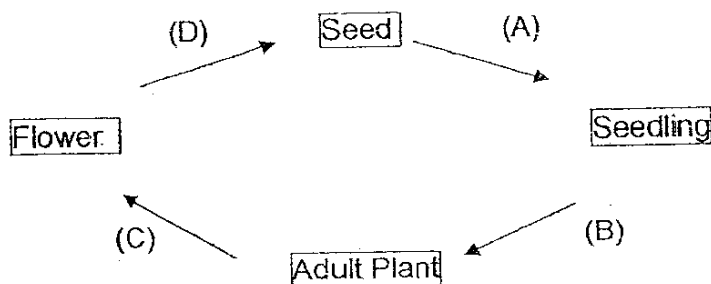


Which of the following statements are correct?

- A: Three daughters can roll the tongue.
- B: The sons cannot roll the tongue.
- C: The children inherit the tongue-rolling characteristics from the mother.
- D: Two of the children can pass on the tongue-rolling trait to their children.

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

7. The diagram below shows the life cycle of a flowering plant. At which stages, A, B, C or D, does the process of germination and fertilization take place respectively?



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

(33)

8. Aces carried out a starch test on the leaves of 3 balsam plants, A, B and C. The aim of his test was to show that light is needed for photosynthesis to take place. He recorded the results in the table below.

| Plant | Colour of Iodine |
|-------|------------------|
| A     | Brown            |
| B     | Dark Blue        |
| C     | Dark Blue        |

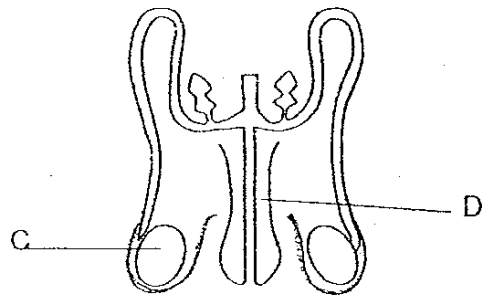
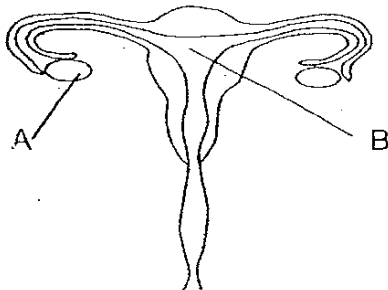
The three plants in the experiment were provided with different light conditions during his experiment. Which one of the following is the correct condition the plant was in?

|     | Light Conditions           | Plant          |
|-----|----------------------------|----------------|
| (1) | Placed under a bright lamp | B              |
| (2) | Kept in a dark cupboard    | C              |
| (3) | Kept in a dark cupboard    | <del>A</del> B |
| (4) | Left it under the Sun      | A              |

9. Which one of the following shows a correct energy path?

- (1) Sun → Herbivore → Carnivore  
 (2) Plants → Deer → Cheetah  
 (3) Toadstool → Millipede → Centipede  
 (4) Grasshopper → Snake → Toad

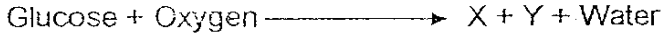
10. The diagrams below show the human reproductive systems.



Which parts produce cells that will join together to develop into a baby?

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

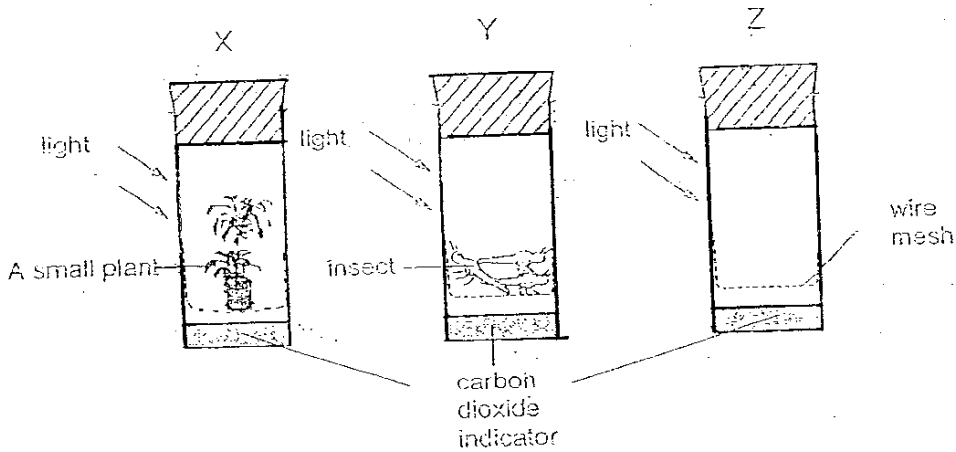
11. The equation below represents a life process. What is X and Y respectively?



- A : Carbon dioxide
- B : Energy
- C : Oxygen
- D : Food

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

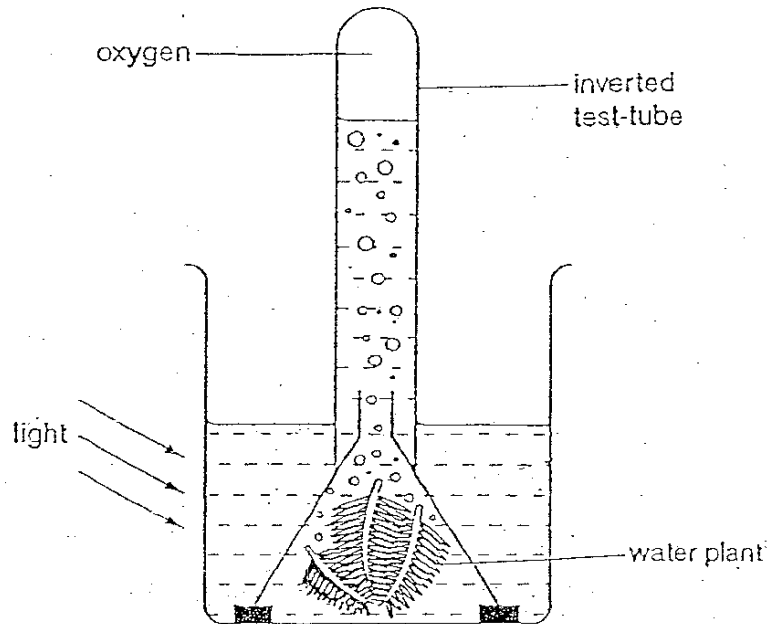
12. Three containers, X, Y and Z, were set-up as shown below. At the start of the experiment, the carbon dioxide indicator in each container was green. The carbon dioxide indicator changes from green to red when exposed to increased amount of carbon dioxide.



What will be the colour of the carbon dioxide indicator in each container after 3 hours?

|     | Container X | Container Y | Container Z |
|-----|-------------|-------------|-------------|
| (1) | Green       | Red         | Red         |
| (2) | Green       | Red         | Green       |
| (3) | Red         | Green       | Green       |
| (4) | Red         | Green       | Red         |

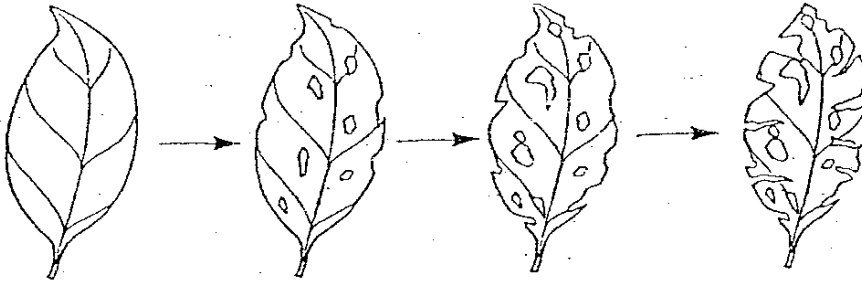
13. Amy set up the following apparatus to find out the effect of different light intensities on the rate of photosynthesis. There are 5 similar set-ups and the diagram below shows one of the set-ups.



Light from 5 bulbs of different voltage was shone on the 5 set-ups. What should Amy do to find out the result of her experiment?

- (1) Measure the temperature of the water.
- (2) Measure the mass of the water plant.
- (3) Count the number of gas bubbles given off.
- (4) Observe whether the water turns chalky.

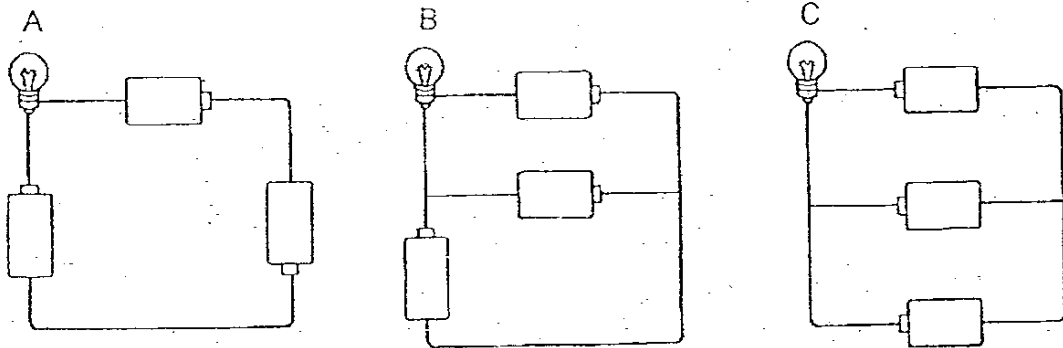
14. The diagram shows changes in the appearance of a leaf on a branch.



Which type of organism is most likely to cause these changes?

- (1) Centipede
- (2) Dragonfly
- (3) Grasshopper
- (4) Praying mantis

15. The diagrams below show 3 electric circuits.

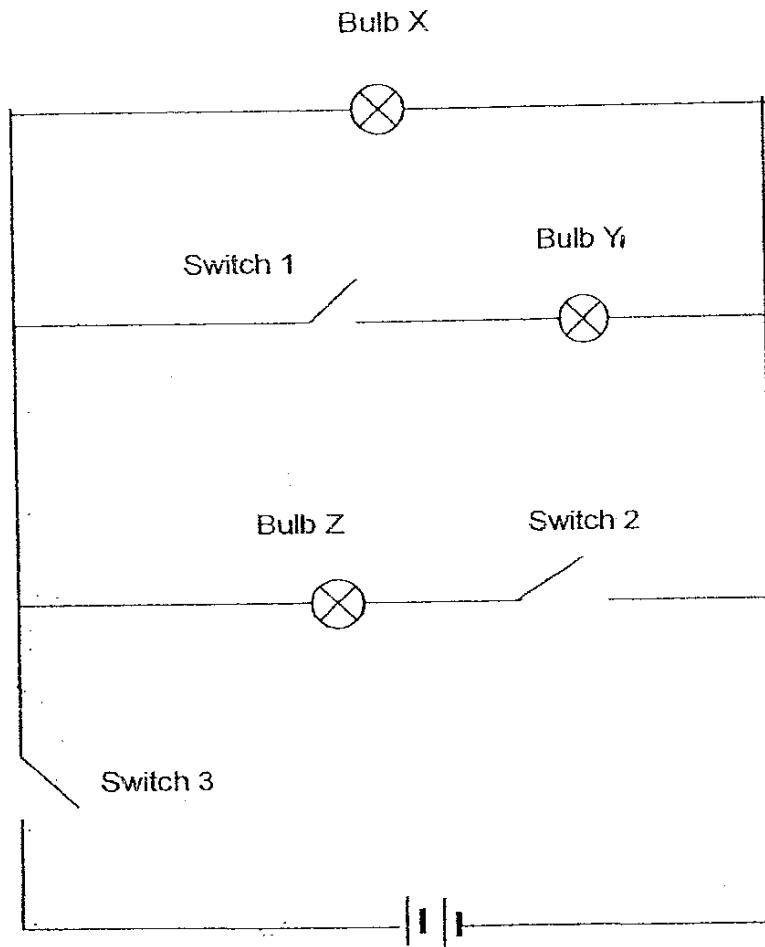


Arrange bulbs A, B and C in ascending order of brightness.

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



16. The diagram below shows an electric circuit.

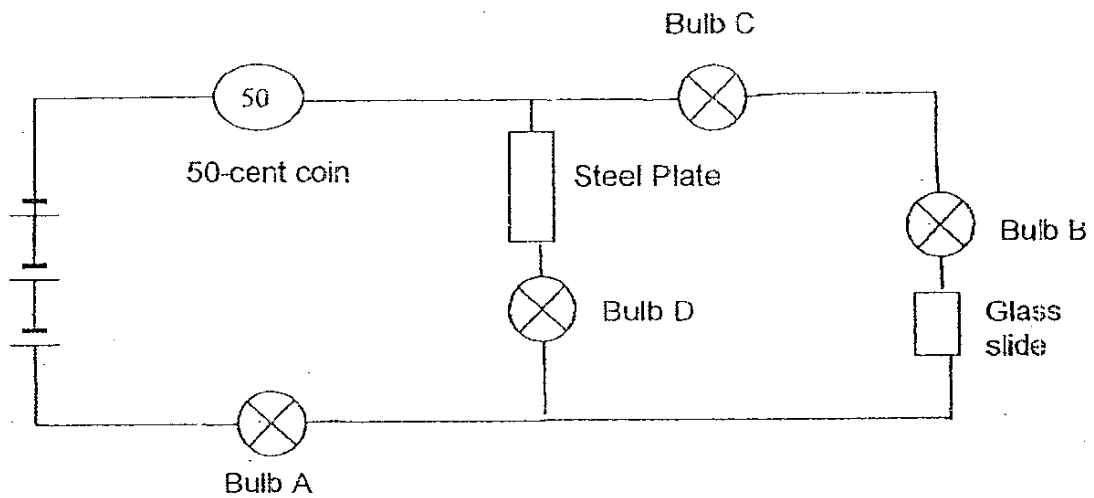


In which order must the switches be closed so that Bulb X lights up first, followed by Bulb Y and then Bulb Z?

|                | First    | Second   | Third    |
|----------------|----------|----------|----------|
| <del>(A)</del> | Switch 1 | Switch 2 | Switch 3 |
| <del>(B)</del> | Switch 2 | Switch 1 | Switch 3 |
| <del>(C)</del> | Switch 3 | Switch 1 | Switch 2 |
| <del>(D)</del> | Switch 3 | Switch 2 | Switch 1 |

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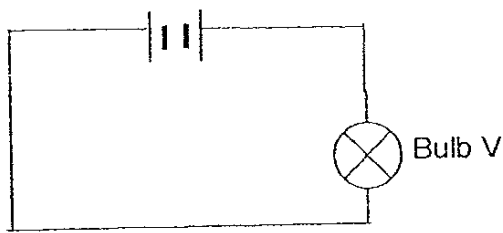
17. Jeff sets up an electric circuit as shown in the diagram below.



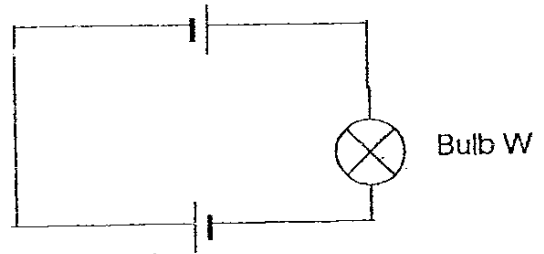
Which of the bulbs will not light up?

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

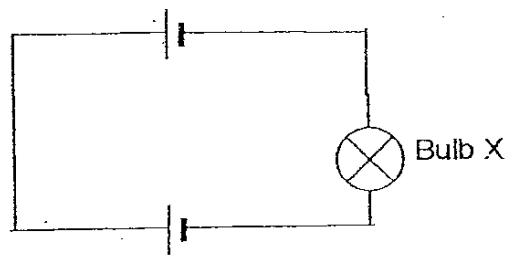
18. The diagram below shows 5 electric circuits.



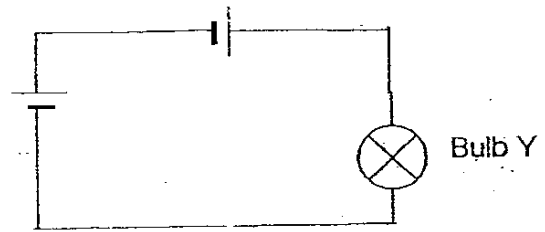
Circuit V



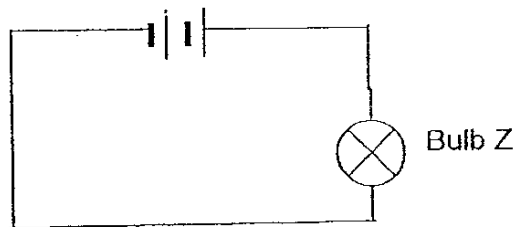
Circuit W



Circuit X



Circuit Y



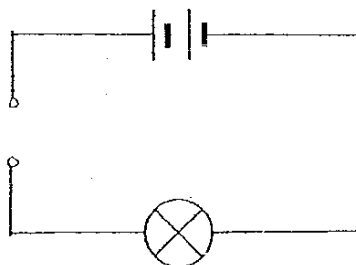
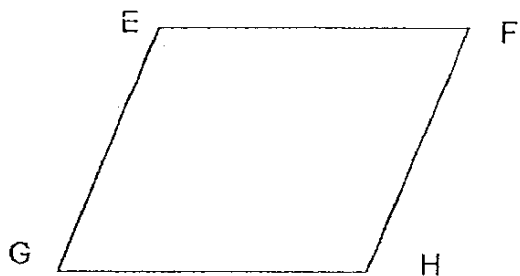
Circuit Z

Which of the following statements are correct?

- A: Bulb Y is dimmer than Bulb Z.
- B: Bulb X and Bulb V do not light up.
- C: Bulb X and Bulb Y are equally bright.
- D: Bulb W and Bulb Z are equally bright.

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

19. The diagram below shows an electric circuit and a circuit tester with points E, F, G and H.



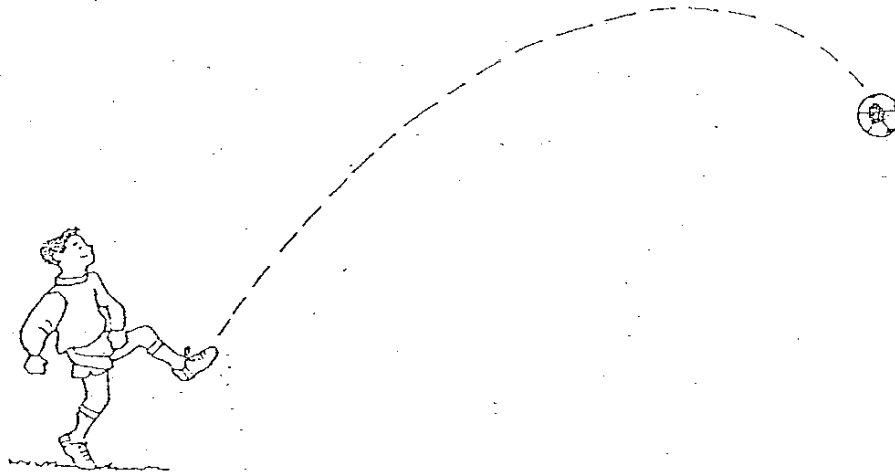
When a circuit tester is connected to points H and F, the bulb lights up. When the circuit tester is connected to points F and G, the bulb does not light up. When the circuit tester is connected to points E and G, the bulb does not light up. When the circuit tester is connected to points E and F, the bulb lights up.

Which of the following are correct?

- A: FG conducts electricity.
- B: HE conducts electricity.
- C: GH does not conduct electricity.

- D: A and B only
- E: B and C only
- F: A and C only
- G: C and D only

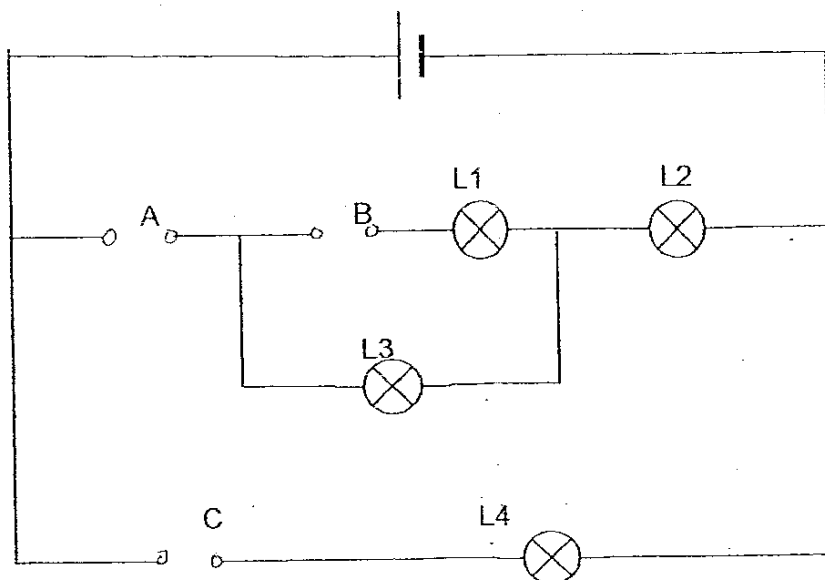
20. Steven kicks a ball as shown in the diagram below.



How can you tell that along the path of the ball, there is a force on the ball?

- (1) The ball changes its direction of movement.
- (2) The ball changes its shape.
- (3) The ball increases its speed.
- (4) The ball stops.

21. Sue had three rods, P, Q and R, of unknown materials. She placed them in various positions, A, B and C, of the circuit shown below.



The results of the experiment were shown in the table below. When any of the lamps, L1, L2, L3 or L4, lit up during the experiment, a tick (✓) was placed in the box.

| Positions where rods were placed |   |   | Lamp |    |    |    |
|----------------------------------|---|---|------|----|----|----|
| A                                | B | C | L1   | L2 | L3 | L4 |
| P                                | Q | R |      | ✓  | ✓  | ✓  |

Which of the following would show the correct result if the rods, P, Q and R, were placed at different positions?

|     | Positions where rods were placed |   |   | Lamp |    |    |    |
|-----|----------------------------------|---|---|------|----|----|----|
|     | A                                | B | C | L1   | L2 | L3 | L4 |
| (1) | P                                | R | Q |      | ✓  | ✓  | ✓  |
| (2) | Q                                | R | P |      |    | ✓  | ✓  |
| (3) | R                                | Q | P | ✓    | ✓  | ✓  |    |
| (4) | Q                                | P | R |      |    |    | ✓  |

22. Luke used Machine Y and made the following observations.

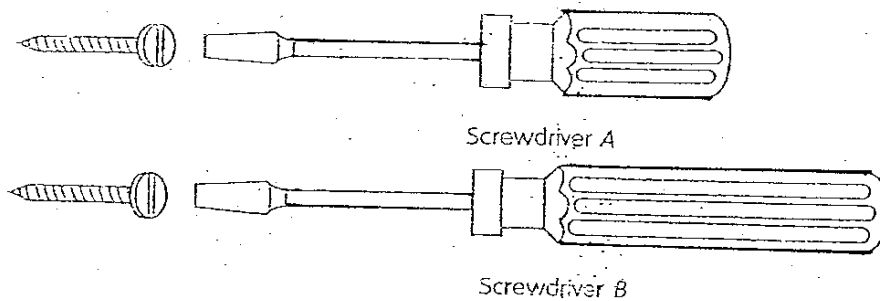
| Machine Y      | Load | Effort |
|----------------|------|--------|
| Effort used    | 5kg  | 5kg    |
| Distance moved | 1m   | 1m     |

Which of the following machines could be Machine Y?

- A : fixed pulley
- B : inclined plane
- C : wheel and axle
- D : movable pulley

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

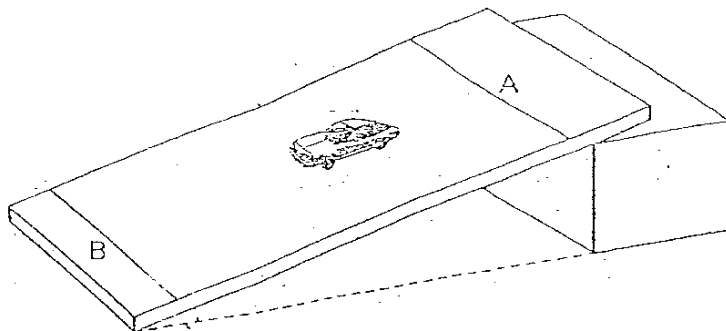
23.



It is easier to use Screwdriver A than Screwdriver B to turn a screw because Screwdriver A has a \_\_\_\_\_.

- (1) longer handle
- (2) wider handle
- (3) shorter handle
- (4) lighter handle

24. Candy carried out an experiment using the apparatus below.



She recorded the time taken for the car to travel from A to B.

The experiment was repeated and the results are shown in the table below.

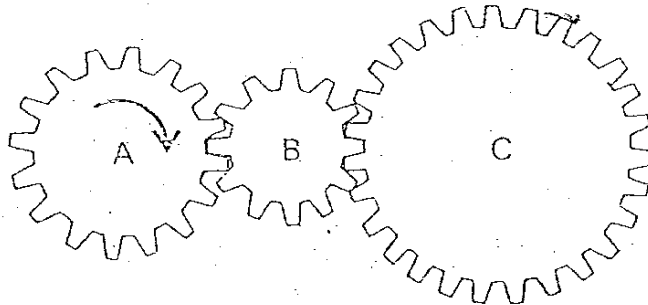
|                          | First experiment | Second experiment |
|--------------------------|------------------|-------------------|
| Length of ramp           | 100              | 150               |
| Distance between A and B | 80               | 80                |
| Angle of ramp            | 30               | 30                |
| Surface of ramp          | Plastic          | Wood              |
| Mass of car              | 40               | 40                |
| Time recorded            | 5.3              | 6.0               |

The aim of Candy's experiment is to find out if the \_\_\_\_\_ affects how fast the car moves.

- (1) mass of the car
- (2) angle of the ramp
- (3) length of the ramp
- (4) surface of the ramp



25. The diagram below shows a set of gears. The direction of rotation of gear A is as shown.



Which of the following describes correctly the speed and direction of rotation of gear B?

|     | Speed of rotation | Direction of rotation |
|-----|-------------------|-----------------------|
| (1) | Fastest           | Clockwise             |
| (2) | Fastest           | Anti-clockwise        |
| (3) | Slowest           | Clockwise             |
| (4) | Slowest           | Anti-clockwise        |

26. The table below gives some properties of four substance A, B, C and D.

| Substance | Colour | Can it dissolve in water? | Is it a magnetic material? |
|-----------|--------|---------------------------|----------------------------|
| A         | White  | Yes                       | No                         |
| B         | White  | No                        | No                         |
| C         | Blue   | Yes                       | No                         |
| D         | Black  | No                        | Yes                        |

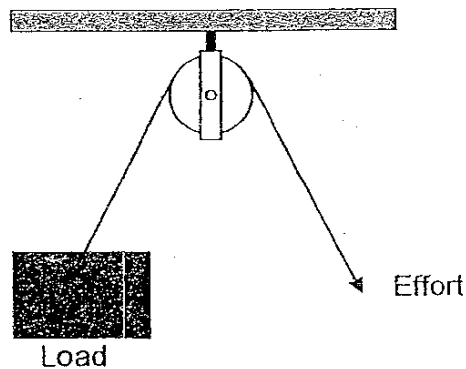
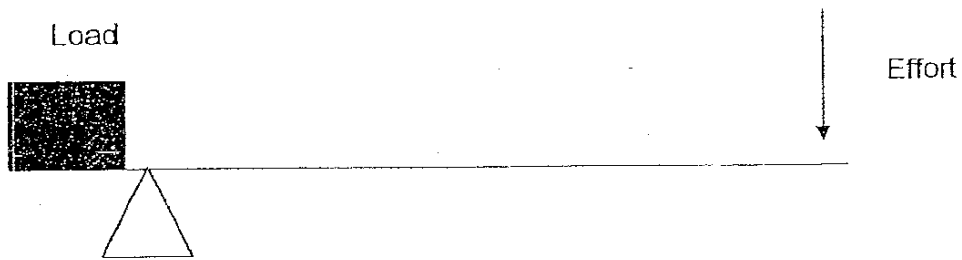
Mrs Tan mixes some fine grains with the four substances together. She asks her pupils to carry out an experiment to separate them. Which two substances would be most difficult for her pupils to separate?

- A and B only  
 A and C only  
 B and C only  
 C and D only

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27. The diagrams below show a lever and a fixed pulley system.

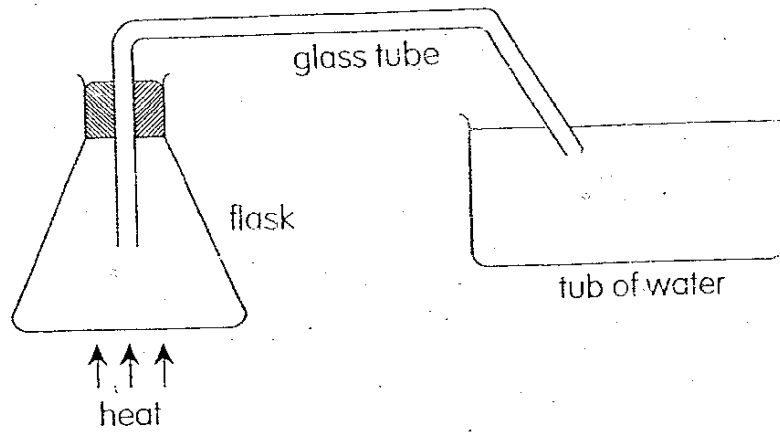


Which one of the following is true about both types of simple machines?

- A: The distance moved by the effort is greater than the distance moved by the load.
- B: The direction of effort is changed.
- C: The effort needed to lift the load is lesser than the load.

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

28.



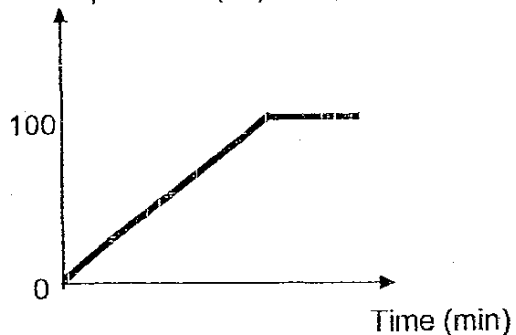
A glass tube was fitted tightly onto an empty conical flask as shown in the diagram above. One end of the glass tube was immersed in a tub of water. The flask was heated.

What can be observed after a while?

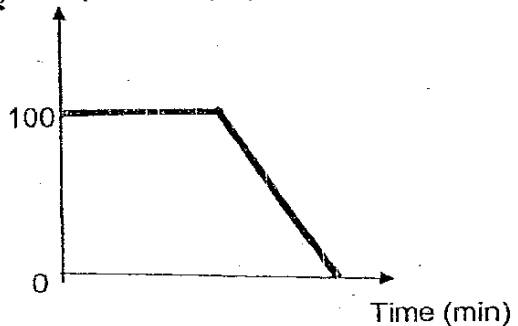
- (1) The water will turn chalky.
- (2) The level of the water will increase.
- (3) The level of the water will decrease.
- (4) Bubbles could be seen at the end of the glass tube.

29. Tim heated a beaker of ice cubes until it changed its state from the solid state to the boiled state. Which of the following graphs correctly shows the changes in temperatures of the ice cube over time?

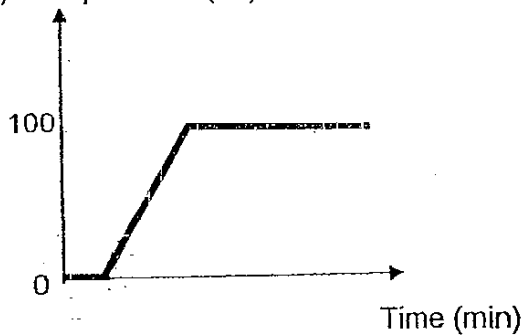
(A) Temperature ( $^{\circ}\text{C}$ )



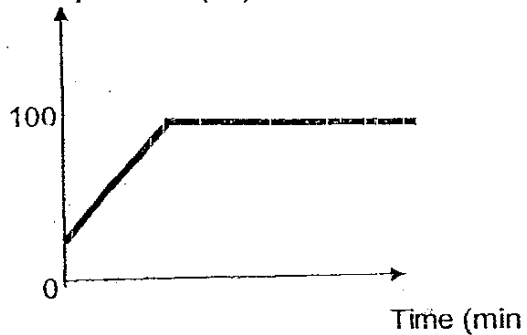
(B) Temperature ( $^{\circ}\text{C}$ )



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

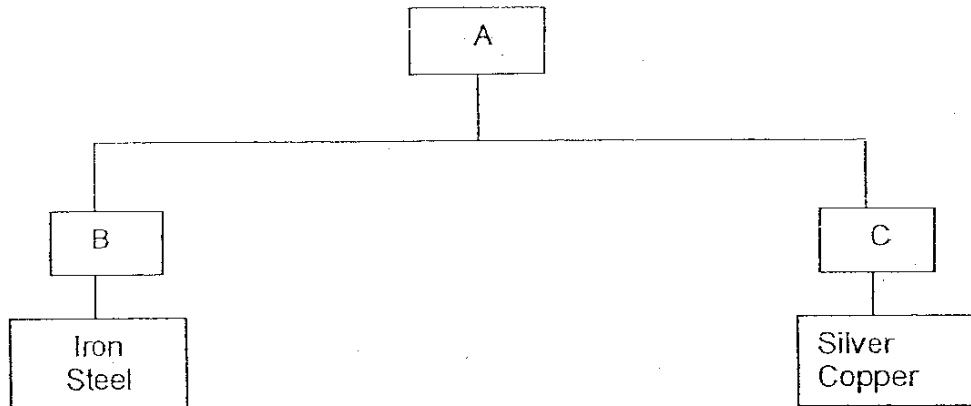


(D) Temperature ( $^{\circ}\text{C}$ )



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30. The classification chart below shows how some things can be classified.



Which one of the following descriptions about A, B and C is correct?

|     | A         | B                            | C                              |
|-----|-----------|------------------------------|--------------------------------|
| (1) | Magnets   | Can be repelled by magnet    | Cannot be repelled by a magnet |
| (2) | Metals    | Can be made into magnets     | Cannot be made into magnets    |
| (3) | Metals    | Non-conductor of heat        | Conductor of heat              |
| (4) | Materials | Non-conductor of electricity | Conductor of electricity       |

**P5 Semestral Assessment 2 (2007)**

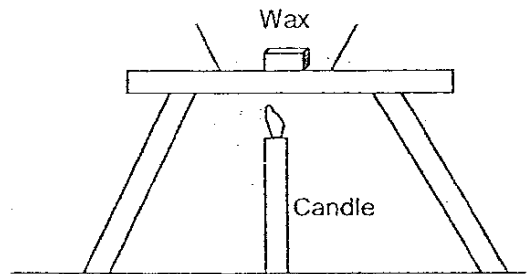
Name: \_\_\_\_\_ ( )

Class: \_\_\_\_\_

**Section B (40 marks)**

**Write your answer in the spaces provided.**

31. The diagram below shows a piece of wax being heated.



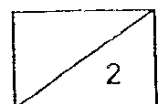
(a) What will happen to the piece of wax after some time? [1]

\_\_\_\_\_

(b) What causes the change in state? [1]

\_\_\_\_\_

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32. Jenny carried out an experiment to compare the rate of evaporation of water. She used 4 different containers and put 40 ml of water in each container. She then placed the 4 containers at the same place and recorded her observations in the table below.

| Container                                | A  | B  | C  | D  |
|------------------------------------------|----|----|----|----|
| Time taken for water to dry up (minutes) | 25 | 38 | 48 | 50 |

- (a) Which container has the largest exposed surface area? Give a reason for your answer. [1]

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- (b) What is the relationship between the exposed surface area of the container and the rate of evaporation? [1]

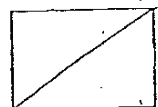
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- (c) State 2 other factors that can affect the rate of evaporation.

(i) \_\_\_\_\_ [1]

(ii) \_\_\_\_\_ [1]



33. The table below shows some details about the planets in our Solar System.

| Planet  | Distance from Sun (million km) | Time taken to make one revolution around the Sun |
|---------|--------------------------------|--------------------------------------------------|
| Mercury | 58                             | 88 days                                          |
| Venus   | 108                            | 225 days                                         |
| Earth   | 150                            | 365 days                                         |
| Mars    | 228                            | 687 days                                         |
| Jupiter | 778                            | 12 years                                         |
| Saturn  | 1,427                          | 29 years                                         |
| Uranus  | 2,870                          | 84 years                                         |
| Neptune | 4,497                          | 165 years                                        |
| Pluto   | 5,914                          | 248 years                                        |

- (a) What is the relationship between the distance of the planet from the Sun and its revolution time? [1]

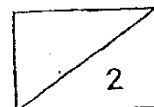
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- (b) Give a reason, other than its distance from the sun, why the earth can support life. [1]

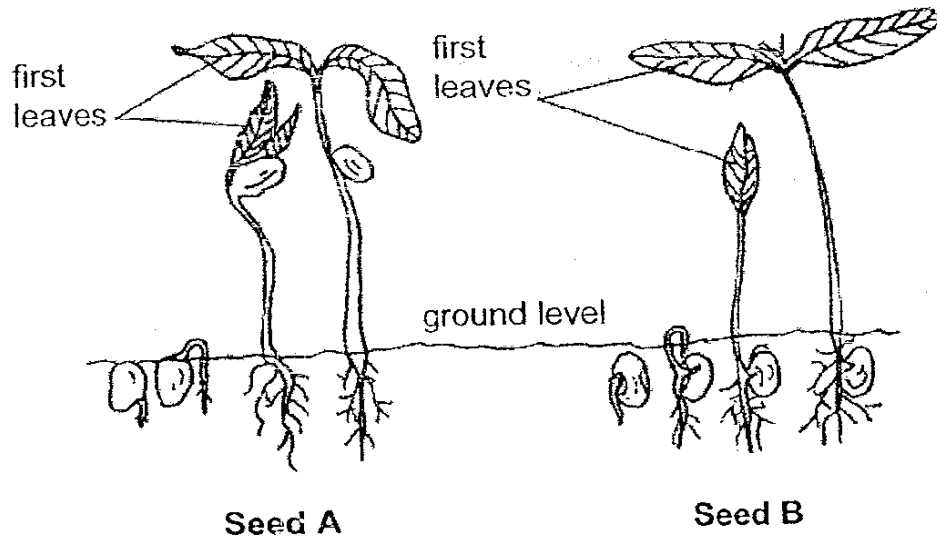
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34. The diagrams show the germination of two seeds, A and B.



- (a) By studying the diagrams, give one difference that can be observed in the way these seeds grow. [1]

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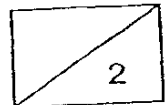
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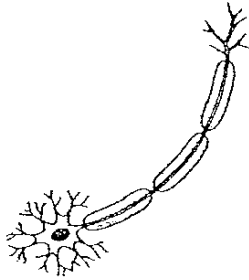
- (b) Apart from air, state two other conditions that are necessary for the seeds to germinate.

(i) \_\_\_\_\_ [½]

(ii) \_\_\_\_\_ [½]



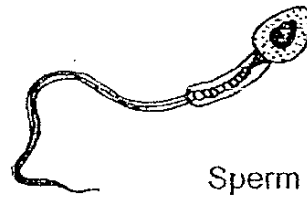
35. The diagrams below show 3 cells found in 3 different parts of a man's body.



Nerve cell



Muscle cell



Sperm cell

(a) Why do all 3 cells have different structures?

[1]

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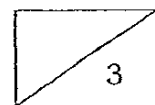
(b) State two differences between the muscle cell shown above and a cell taken from a leaf.

(i) \_\_\_\_\_

[1]

(ii) \_\_\_\_\_

[1]

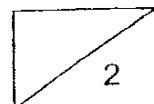
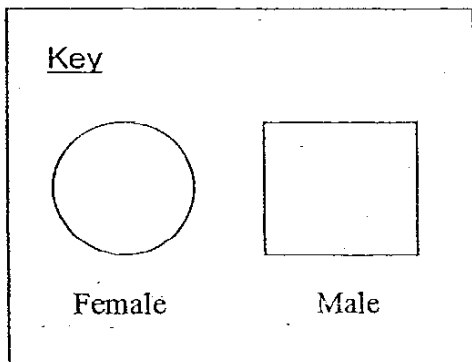
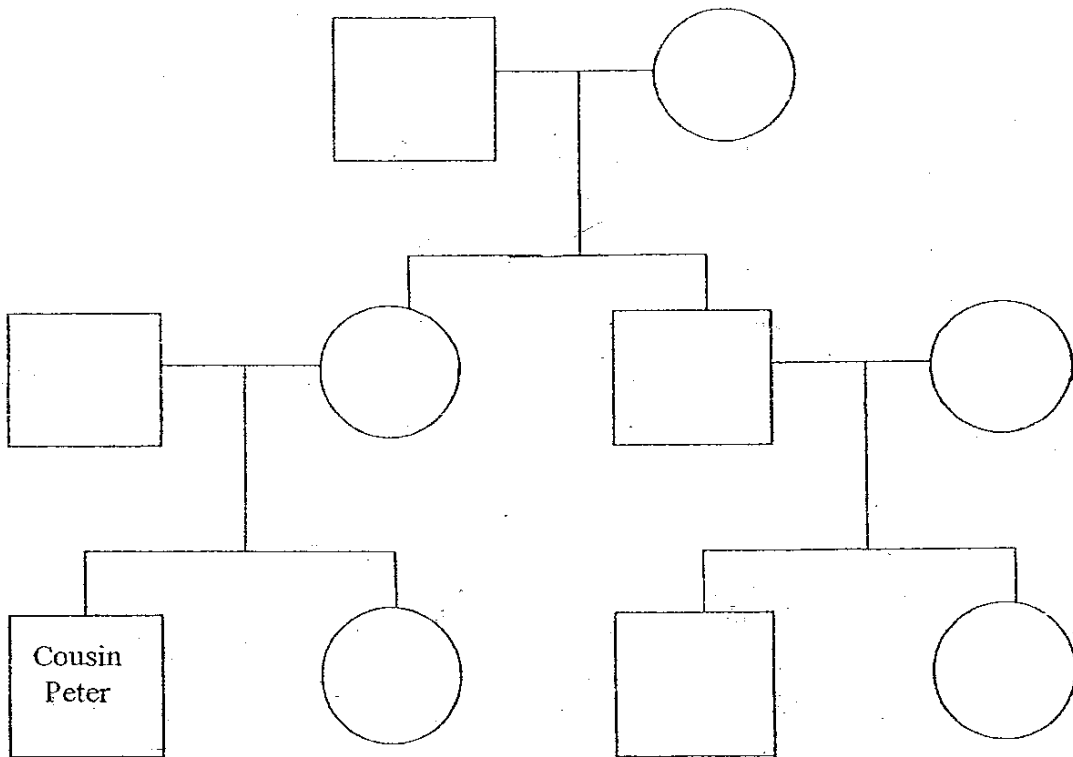


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36. The table below shows Daniel's family tree.

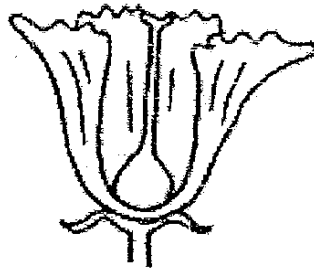
| Letter | Family member        |
|--------|----------------------|
| A      | Daniel's aunt        |
| B      | Daniel's mother      |
| C      | Daniel's grandfather |
| D      | Daniel               |

Using the information in the above table, identify the family members by writing the correct letter in the family tree below. Daniel's cousin, Peter, has been identified. [2]

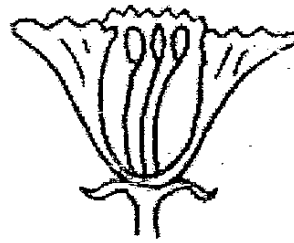


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37. The diagrams below show the cross-sections of 4 flowers, A, B, C and D.



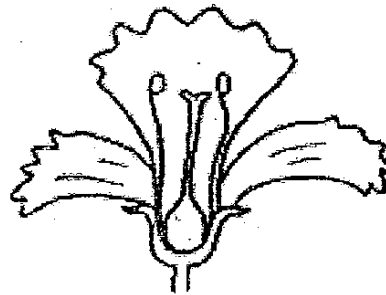
A



B



C



D

(a) Which one of the above flowers can never develop into a fruit? Give 2 reasons for your answer. [2]

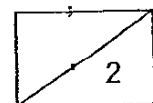
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38. David observed several buds growing on a potato. He cut away one of the buds from the potato and planted it in a pot of soil. Both the pot and the potato were placed together in front of a window. David provided each of them with the same amount of water everyday.

(a) What do you think would happen to the bud in the pot and the buds on the potato after one week? [1]

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(b) Explain your answer in (a). [2]

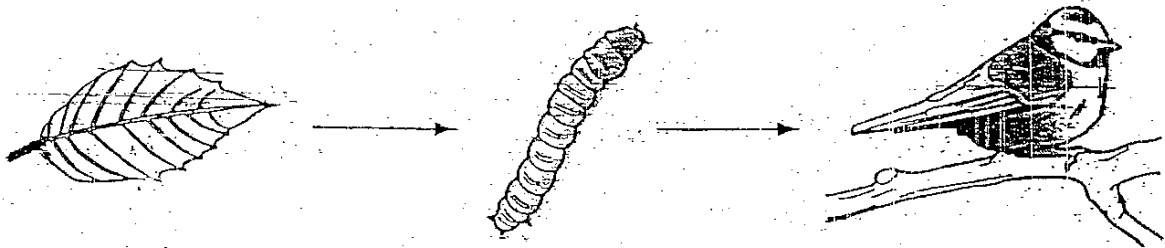
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39. The diagram shows a simple food chain.



(a) What is the source of energy for the leaf?

[1]

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(b) Animals depend on plants for food. How does the plant depend on the bird?

[1]

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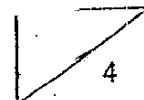
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(c) Explain what happens when the food we eat reaches the small intestine.

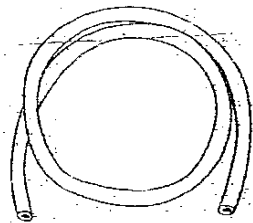
[2]

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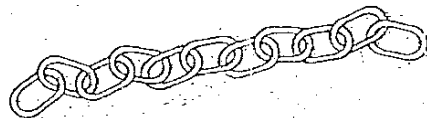
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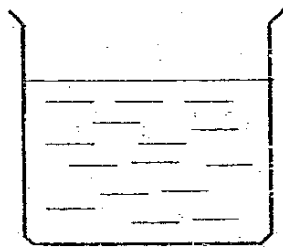
40. You are given the apparatus shown below.



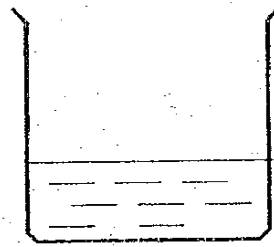
Rubber hose



Metal chain



Beaker A  
90°C



Beaker B  
25°C

(a) Write down the steps, you will take, using the materials above to show how heat can be transferred from one container to another, without pouring any water over. You need not use all the materials. [2]

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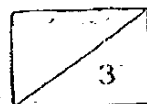
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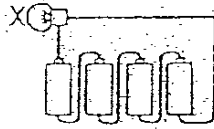
(b) Explain your choice of object used in the above experiment. [1]

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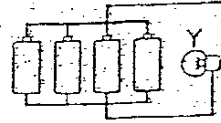
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41. Study carefully the two electrical circuits, A and B, given below.



Circuit A



Circuit B

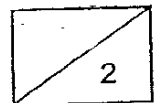
What do you think will happen when one of the batteries runs out of energy in each of the circuits? Give one reason to explain your answer.

(a) Circuit A:

\_\_\_\_\_ [1]

(b) Circuit B:

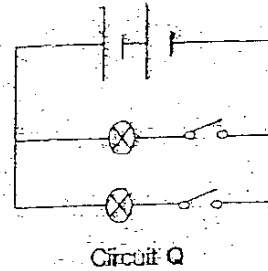
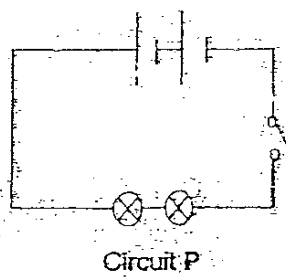
\_\_\_\_\_ [1]



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42. A boy set up two electrical circuits, P and Q, below.



What are two advantages of connecting the bulbs in Circuit Q as compared to Circuit P?

(a) \_\_\_\_\_  
\_\_\_\_\_ [1]

(b) \_\_\_\_\_  
\_\_\_\_\_ [1]

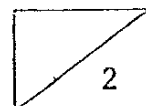
43. Explain by giving reasons why both metal and non-metal parts are always found in an electrical appliance.

(a) Metal parts:

\_\_\_\_\_ [1]  
\_\_\_\_\_

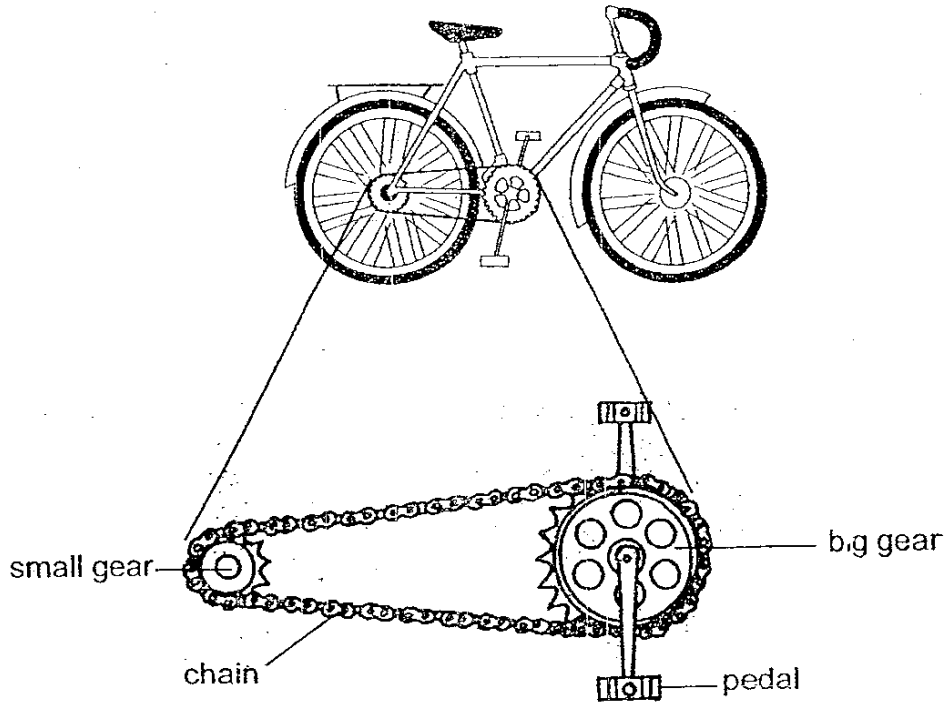
(b) Non-metal parts:

\_\_\_\_\_ [1]  
\_\_\_\_\_



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44. The diagram below shows a bicycle and its gears.



Explain how two features of the gears in the bicycle enable it to move forward quickly when the pedal is turned.

(a) \_\_\_\_\_

\_\_\_\_\_

[1]

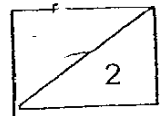
(b) \_\_\_\_\_

\_\_\_\_\_

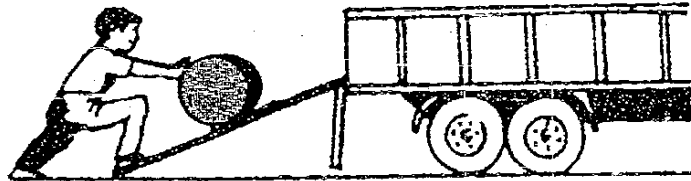
\_\_\_\_\_

[1]

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2015



45. A construction worker used a plank to raise a drum of sand up a truck as shown below. He found it very difficult to raise the drum. The worker then changed the plank to a longer one.



- (a) How is the effort needed to raise the drum changed? [1]

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- (b) How is the distance the man has to move the drum changed? [1]

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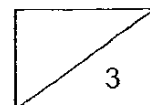
- (c) From your answers to (a) and (b), what can you conclude about the effort needed and the distance the effort has to move through? [1]

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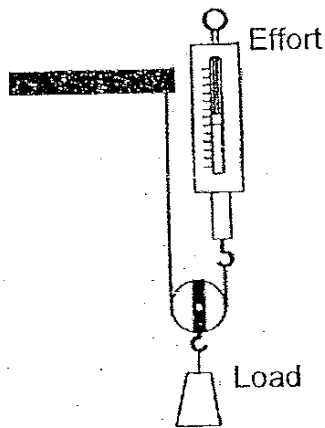
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46. 2 boys, John and Henry, set up the pulley system as shown below to find out the relationship between the load and effort. They put different loads of 100g, 200g, 300g and 400g on the pulley one at a time and determined the effort required.



They recorded the results in the table as shown below:

| John's readings |                 | Henry's readings |                 |
|-----------------|-----------------|------------------|-----------------|
| Load / g        | Effort used / g | Load / g         | Effort used / g |
| 100             | 255             | 100              | 56              |
| 200             | 500             | 200              | 110             |
| 300             | 645             | 300              | 162             |
| 400             | 855             | 400              | 218             |

- (a) Whose readings were correct? Give a reason for your answer. [1]

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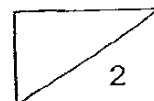


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- (b) Name an object that makes use of a fixed pulley. [1]

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Ai Tong Primary School

Primary 5 Science SA2 Exams (2007)

**Answer Keys**

**SECTION A : (60 MARKS)**

| Qn no. | Ans |
|--------|-----|
| 1      | 1   |
| 2      | 1   |
| 3      | 3   |
| 4      | 3   |
| 5      | 2   |
| 6      | 3   |
| 7      | 4   |
| 8      | 1   |
| 9      | 2   |
| 10     | 2   |

| Qn no. | Ans |
|--------|-----|
| 11     | 1   |
| 12     | 2   |
| 13     | 3   |
| 14     | 3   |
| 15     | 2   |
| 16     | 3   |
| 17     | 3   |
| 18     | 4   |
| 19     | 2   |
| 20     | 1   |

| Qn no. | Ans |
|--------|-----|
| 21     | 4   |
| 22     | 1   |
| 23     | 2   |
| 24     | 4   |
| 25     | 2   |
| 26     | 2   |
| 27     | 2   |
| 28     | 4   |
| 29     | 3   |
| 30     | 2   |

**SECTION B (40 MARKS)**

31a. It will melt.

31b. The heat given out by the lighted candle causes the change in state.

32a. Container A. The time taken for water in container A to dry up is the fastest.

32b. The larger the area of exposed surface, the faster the rate of evaporation.

32c (i) Wind

(ii) Temperature

33a. The shorter the distance of the planet from the sun, the lesser time needed for it to make one revolution around the sun.

33b. The earth has the ozone layer to block harmful rays from the sun.

34a. The seed leaves of seed A are above the ground but that of seed B are below the ground.

34b (i) Water

(ii) Warmth

35a. All three cells have different structures because they have different function cells.

35b (i) The muscle cell does not have a cell wall but the cell taken from a leaf has a cell wall.

(ii) The muscle cell does not have chloroplasts but the cell taken from a leaf has chloroplasts.

36 (i) C

(ii) A

(iii) B

(iv) D

37. Flower B. Flower B can never develop into a fruit because it is a male flower, and has anthers only. B also does not have an ovary.
- 38a. The bud in the pot could not grow but the buds on the potato could grow.  
38b. The bud in the pot could not grow as there were not food given but the buds on the potato could grow as there were stored foods in the potato so the buds could use the food that is stored.
- 39a. The sun.  
39b. The plant depends the bird for pollination of its flower, the dispersal of seeds and the supply of number when it decomposes.  
39c. Food is digested and absorbed into the blood stream in the small intestine.
- 40a. Soak the metal chain in beaker A for ten minutes. Take the metal chain up and soak it in beaker B for another ten minutes. The temperature of the water in beaker B will rise.  
40b. Metal chain is a good conductor of heat. It will get hot easily if it is in touch with hot things.
- 41a. The bulb will not light up. The batteries are arranged in series, once there is a broken circuit, the others will stop working.  
41b. Bulb Y will continue to light up brightly as usual due to the parallel arrangement of the batteries.
- 42a. If one bulb in circuit P fused, the second will also not light up. If one bulb in circuit Q fused, the other one will still light up.  
42b. The bulb in circuit Q will not be affected if one switch is open but the bulb in circuit P will be affected if one switch is open.
- 43a. They conduct electricity.  
43b. They are non-conductors of electricity so when we touch it we will not be electrocuted.
- 44a. The connection of the two gears by the chain in the way shown allows them to turn in the same direction.  
44b. The small gear turns faster than the big gear and so causes the rear wheel to spin faster than pedal.
- 45a. The effort used is lesser.  
45b. The distance is longer.  
45c. The effort needed, the longer distance the effort has to move.
- 46a. Henry's readings were correct. Movable pulley will reduced the effort use instead of increasing the effort use.  
46b. Fishing rod.