# NANYANG PRIMARY SCHOOL

PRIMARY 6 SCIENCE

SEMESTRAL ASSESSMENT 1
2004

SA1

**BOOKLET A**

Date : 7 May 2004

Duration : 1 h 45 min

Name : _____ _____ (  )

Class: Primary 6 (  )

Marks Scored:

| | |
|---|---|
| Booklet A: | 60 |
| Booklet B : | 40 |
| Total : | 100 |

Parent's signature: .....

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

Booklet A consists of 22 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. One of the following activities which Ali carried out made use of all his senses of touch, smell, sight, taste and hearing. Which one of the following is the activity?

   (1) Playing computer games
   (2) Eating grilled food on a hotplate
   (3) Eating a strawberry-flavoured jelly
   (4) Reading a book while listening to music

2. Electrical energy can be converted into _____ energy.

   A sound
   B light
   C heat
   D kinetic
   E solar

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

3. Which one of the following statements about friction is not true?

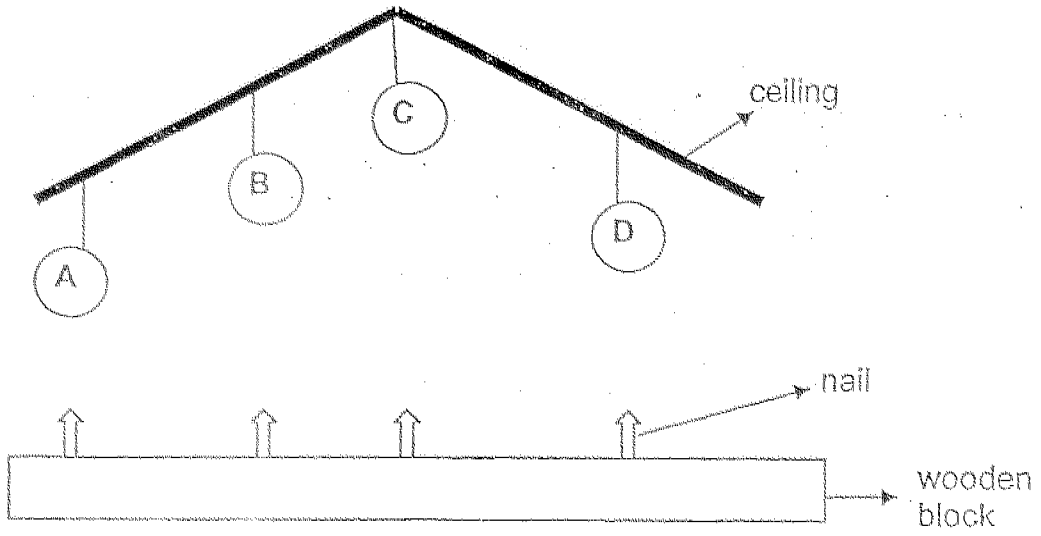
   (1) It exists between two surfaces in contact.
   (2) It can change the direction of a moving object.
   (3) It depends on the texture of the surfaces in contact.
   (4) It is present when an object moves through air or water.

4. Which of the following possess potential energy?

   A A fully charged car battery
   B A bowling ball rolling on the lane
   C A flower vase falling from a shelf
   D A wound-up musical box playing music
   E A revolving fan

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

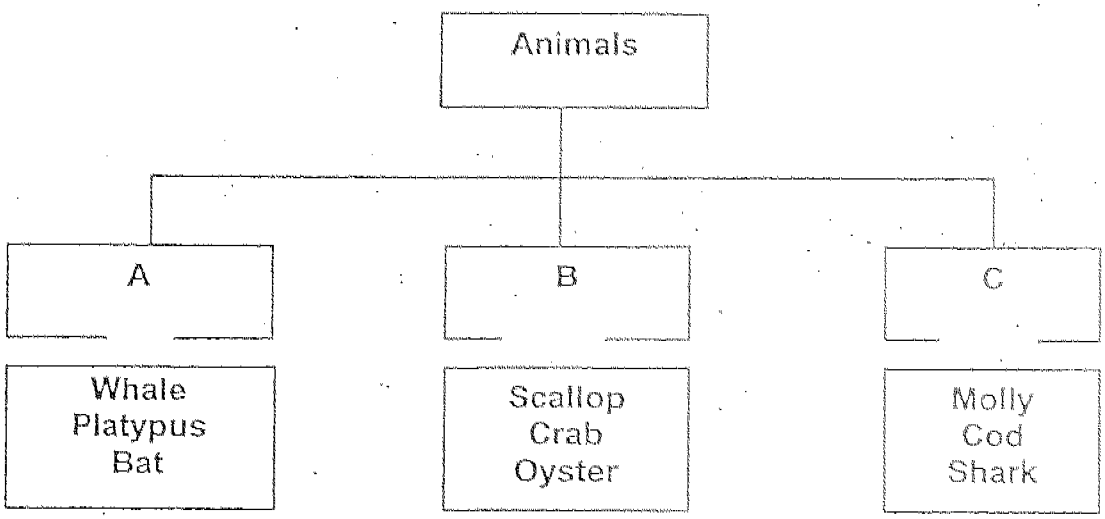
5. In the diagram below, four identical weights, A, B, C and D, were suspended from the ceiling above four identical nails driven 1 cm into the wooden block.




Which one of the weights would cause the nails below to move the furthest into the wooden block when the four weights were released at the same time?

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

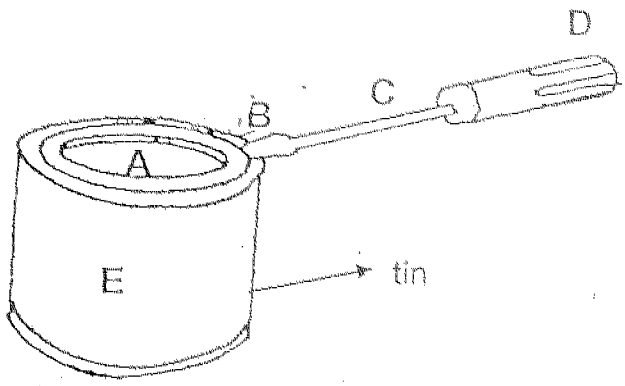
6. Study the animal classification chart as shown below carefully.




How are the above animals classified?

(1) according to their habitats
(2) according to their movement
(3) according to their outer coverings
(4) according to how they reproduce

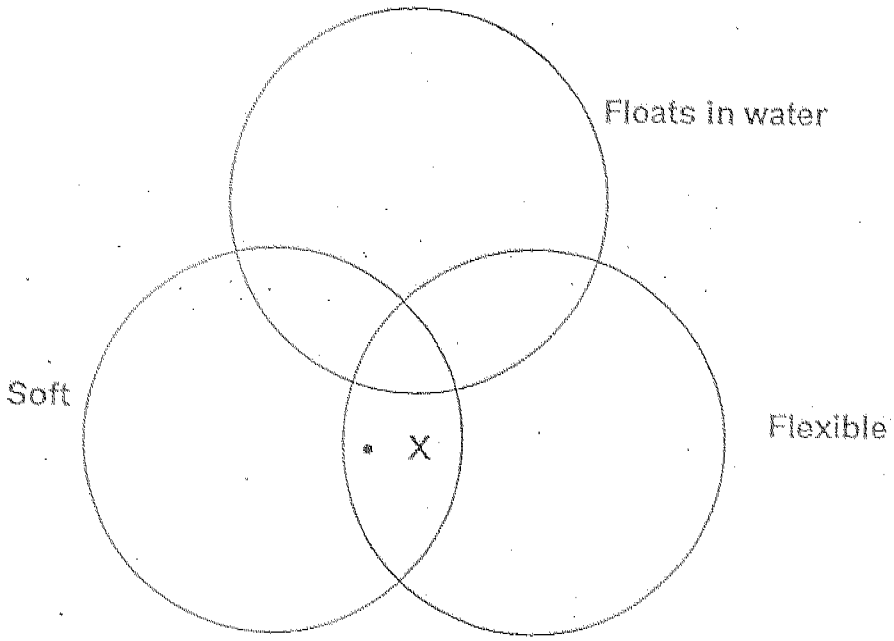
7. In the diagram below, a screwdriver is used to open a tin of paint with the least effort.




Which one of the following best describes the position of where the force is applied, where friction is present and where the effect of force is seen?

| | Force applied | Friction present | Effect of force seen |
|---|---|---|---|
| (1) | D | A | C |
| (2) | D | B | A |
| (3) | C | A | B |
| (4) | B | A | E |

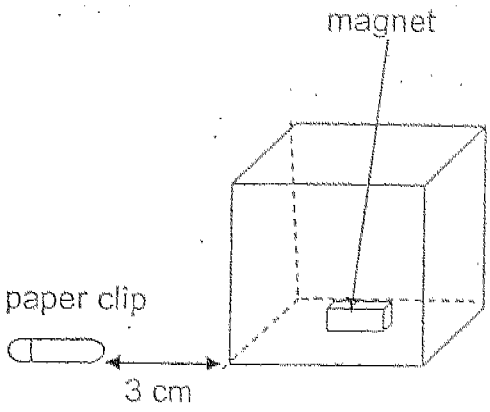
8. Study the Venn diagram as shown below.




Which one of the following objects is a likely example of X?

(1) cork
(2) eraser
(3) gold ring
(4) matchstick

9. Four similar magnets were placed in the centre of 4 boxes made of different materials, W, X, Y and Z, each of the same thickness. When a paper clip was placed 3 cm from each box, the observations were recorded in the table below.

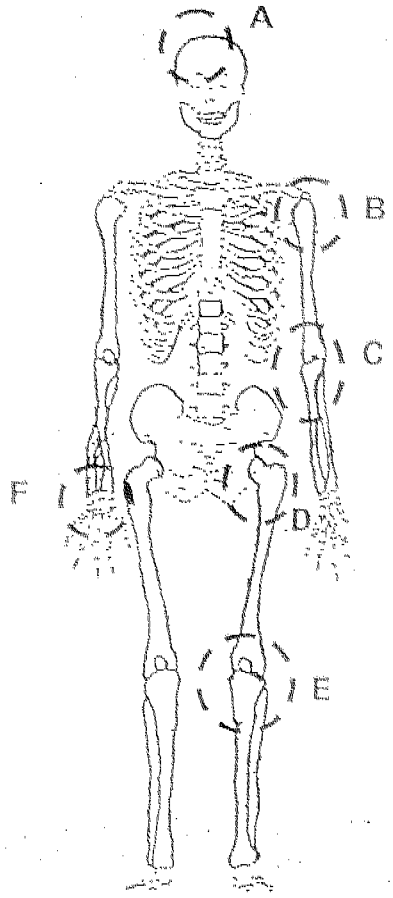



| Box | Did the paper clip move towards the box? |
|---|---|
| W | Yes |
| X | No |
| Y | Yes |
| Z | Yes |

What is Box X most likely made of?

(1) Plastic
(2) Cobalt
(3) Copper
(4) Titanium

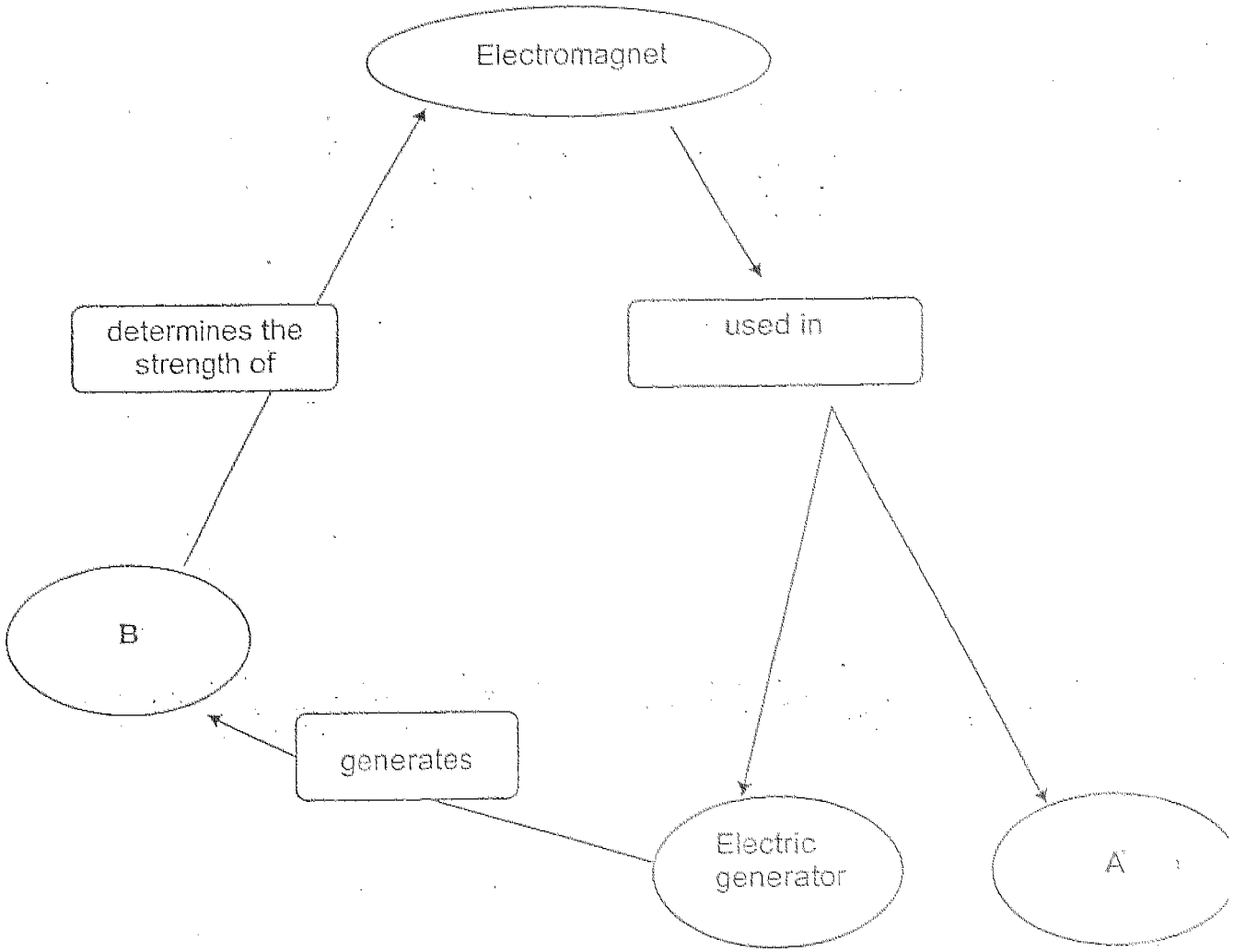
10. The diagram below shows a human skeleton.




Joints can be classified according to their ability to move.
Which of the following parts of the body, A, B, C, D, E and F represent the different types of joints?

| | Movable joint that moves in one direction only | Movable joint that moves in more than one direction | Immovable joint |
|---|---|---|---|
| (1) | C, E, F | A, D | B |
| (2) | A, C, E | B, F | D |
| (3) | C, E | B, D, F | A |
| (4) | C, D, E | B, F | A |

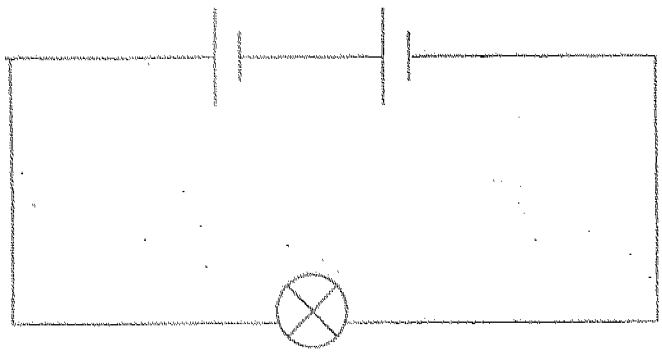
11. Study the concept map below carefully.




Which one of the following pairs best represents A and B?

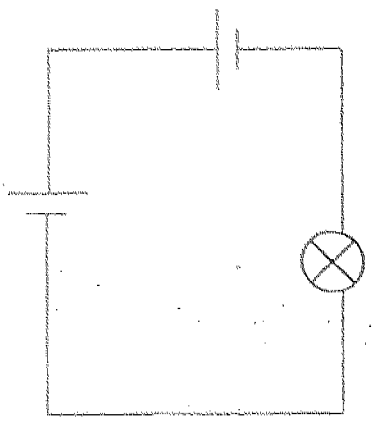
| | A | B |
|---|---|---|
| (1) | refrigerator | force |
| (2) | electric drill | magnetism |
| (3) | compass | heat energy |
| (4) | telephone | electric current |

12. Lisa set up an electrical circuit as shown below.

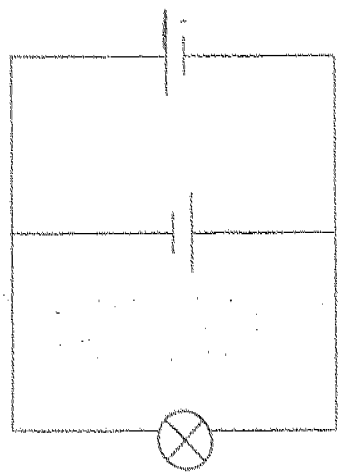


If all the batteries, bulbs and wires were identical, which one of the following circuit would the bulb have the same brightness as the one Lisa has set up?

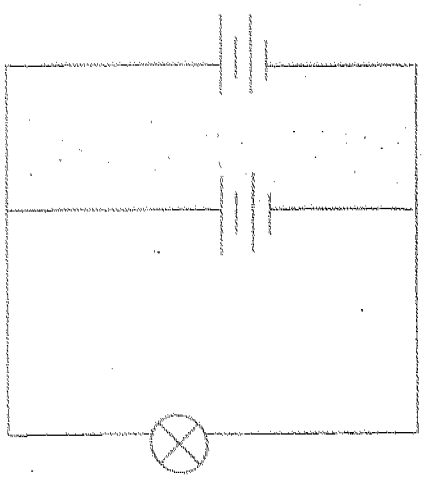
(1)



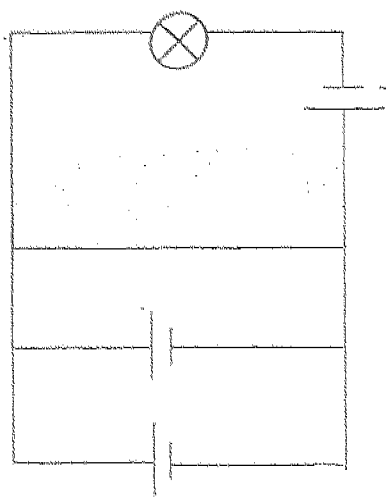
(2)



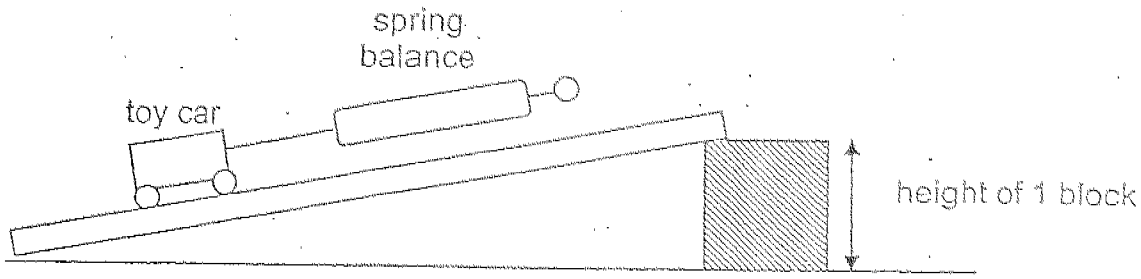
(3)



(4)

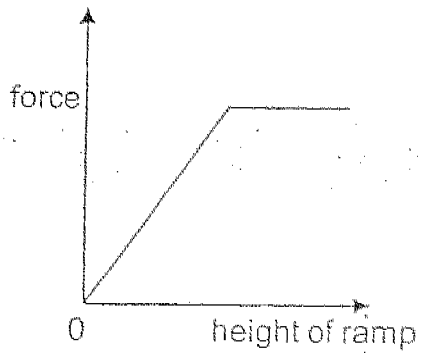


13. A group of pupils carried out an experiment to find out how the force applied to pull the toy car up the ramp varied with the height of the ramp as shown in the diagram below. They varied the height by changing the number of the blocks.

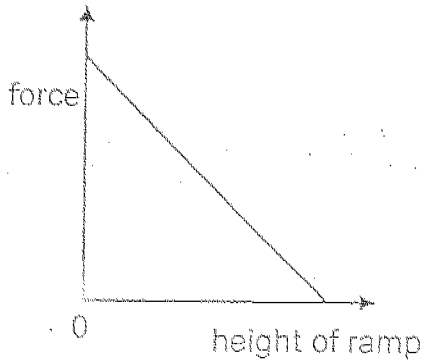



Which one of the following graph best illustrates their results?

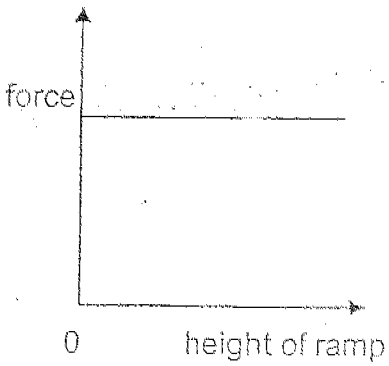
(1)



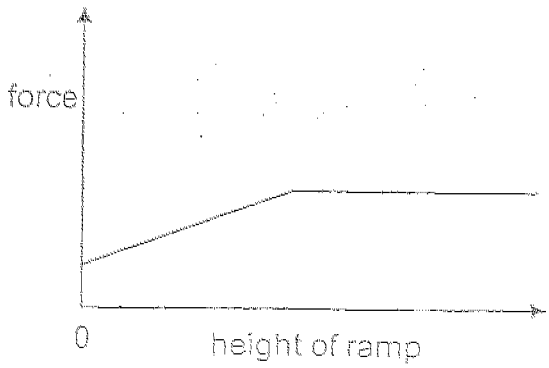

(2)



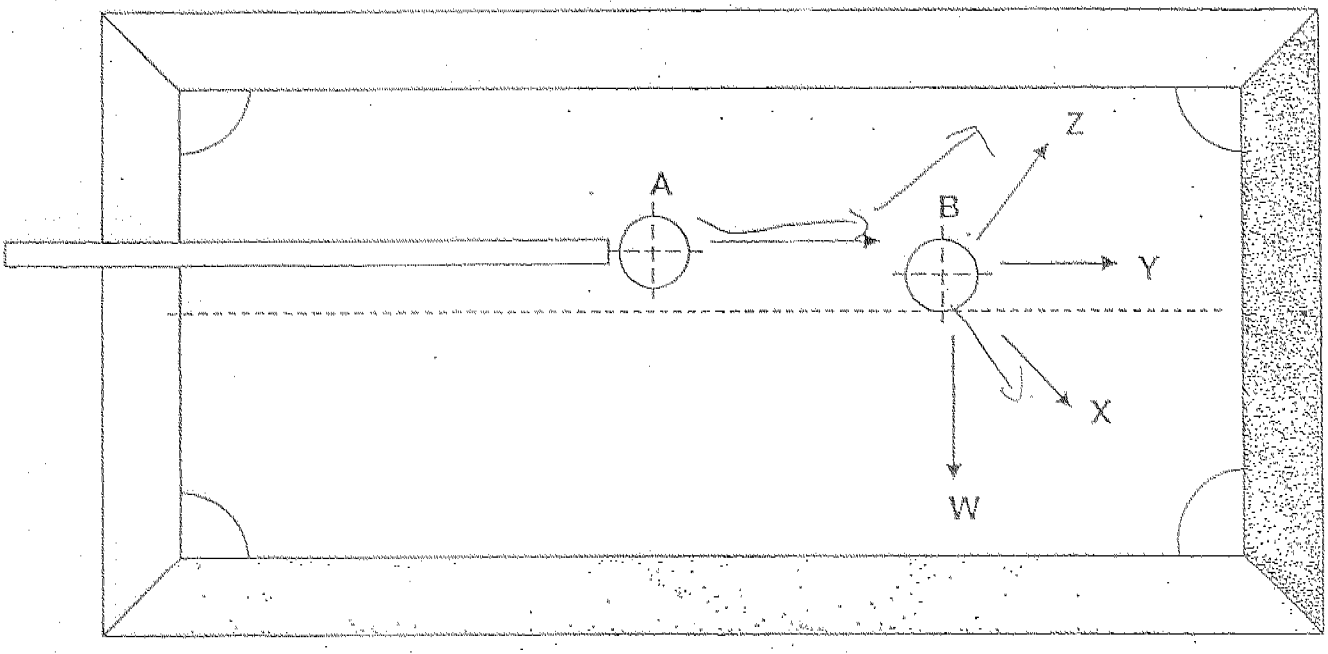

(3)




(4)



For Questions 14 and 15, refer to the diagram as shown below.
The diagram shows Ball A and Ball B on a snooker table.



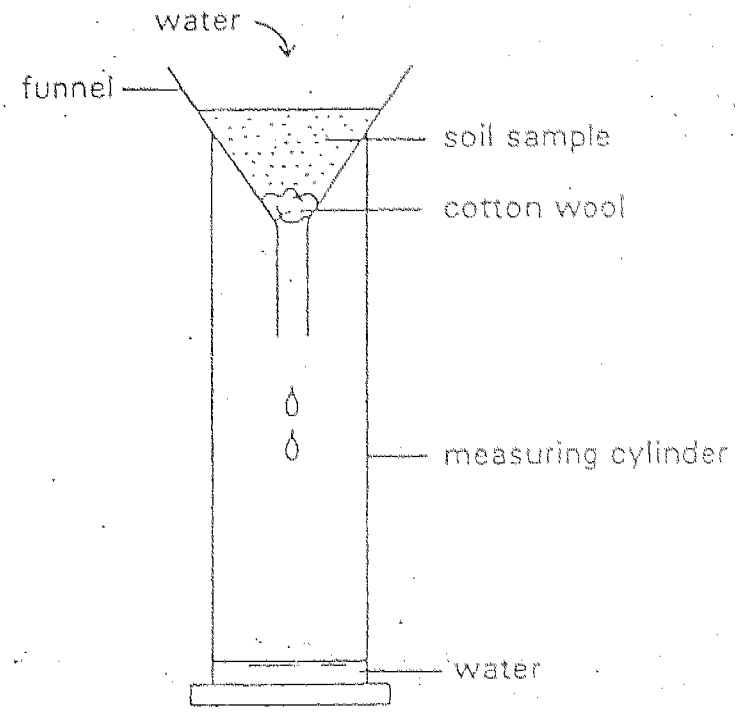

14. When Ball A is hit towards the stationary Ball B in the direction as shown, in which direction will Ball B likely move?

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

15. On hitting Ball B, which one of the following best describes the energy Ball B possesses?

| | Chemical potential energy | Kinetic energy | Heat energy | Sound energy |
|---|---|---|---|---|
| (1) | √ | | | |
| (2) | | √ | √ | √ |
| (3) | √ | √ | √ | |
| (4) | | | √ | √ |

16. A group of primary six pupils wanted to find out how fast water could pass through four types of soil. They set up the experiment as shown in the diagram. They measured the time taken for the water to pass through each type of soil.



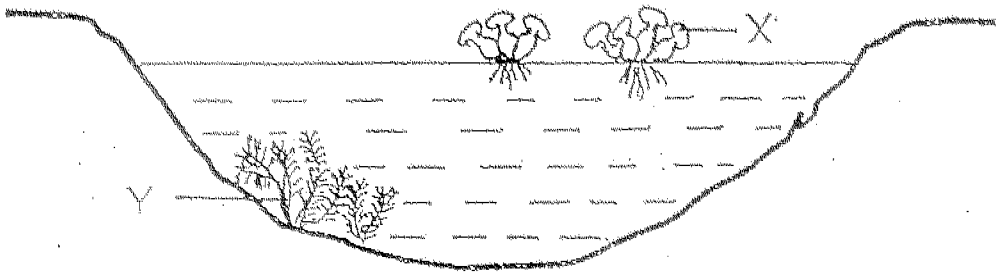

They recorded the results in the table as shown below.

| Type of soil | P | Q | R | S |
|---|---|---|---|---|
| Time taken (seconds) | 80 | 42 | 34 | 16 |

Which type of soil is the most suitable for a partially submerged plant which grows well in a pond?

(1) P
(2) Q
(3) R
(4) S

17. The diagram below shows the populations of two water plants, X and Y, found in a pond community.



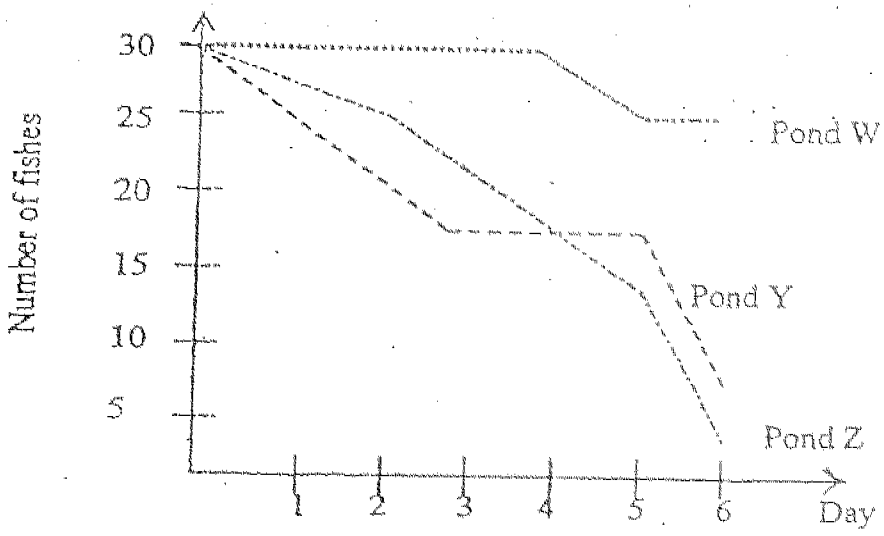

It was observed that the population of water plant Y decreased when the population of water plant X reached a peak.

Which of the following factors could have led to the decrease in the population of water plant Y as a result of the increased population of water plant X?

A Lack of space
B Lack of sunlight
C Lack of nutrients
D Lack of dissolved gases in the water

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

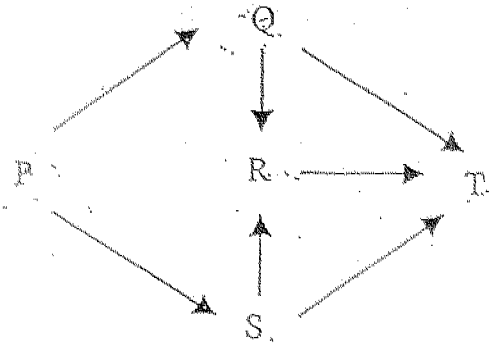
18. In an experiment, 3 cages were lowered into ponds W, Y and Z. Each cage contained the same number and the same type of fish and was lined with nets. The number of fishes that were alive in the cages was counted over a period of 6 days. The results were as shown in the graph below.




Which one of the statements about the results is true?

(1) Pond Y had more predators of the fishes than Pond Z.
(2) Pond W had more plants than Pond Y and Pond Z.
(3) The cage in Pond Z had the least number of fishes on the 6th day.
(4) On the 5th day, there were more fishes in the cage in Pond Y than in Pond W.

19. Study the food web as shown below. The letters P to T represent 5 different types of organisms.




If the entire population of Q is destroyed, which of the following are likely to happen?

A P would decrease in number.
B R would increase in number.
C T would eat more of R and S.
D S would have fewer competitors for food.

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

20. Jimmy carried out a study on two types of habitats. The table below shows his observations of the habitats.

| Observation | Habitat A | Habitat B |
|---|---|---|
| The spiders were eating the ants. | √ | |
| The habitat was damp and dark throughout the day. | | √ |
| Some birds were building nests there. | √ | |
| Woodlice were seen crawling around. | | √ |

Which one of the following observations best describes habitats A and B?

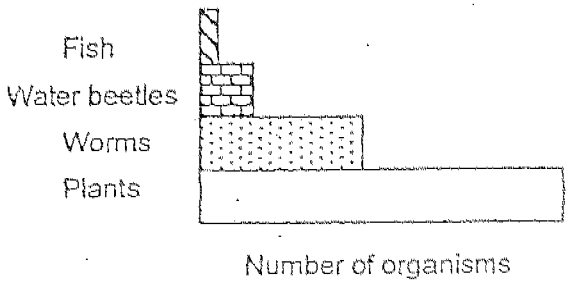
| | Habitat A | Habitat B |
|---|---|---|
| (1) | Seaside | Field |
| (2) | Rotting log | Pond |
| (3) | Single tree | Leaf litter |
| (4) | Rainforest | Ocean |

21. Look at the food chain in a fresh water pond as shown below.

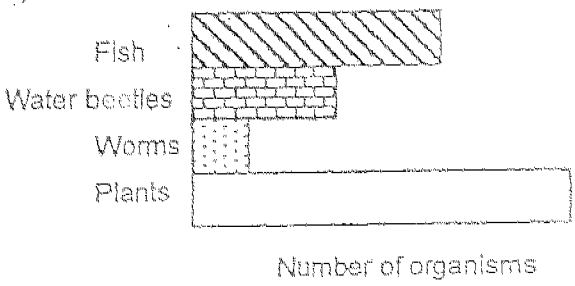
Plants ⟶ worms ⟶ water beetles ⟶ fish

Which one of the following graphs shows the likely size of the four populations in a balanced freshwater pond community?

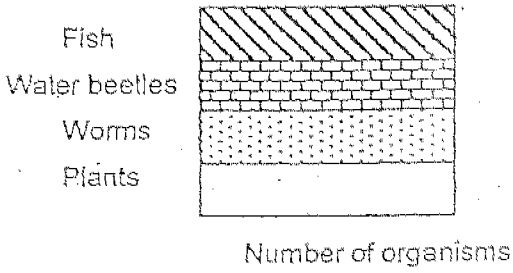
1)



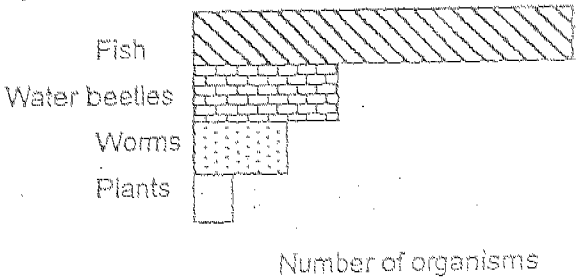

2)




3)

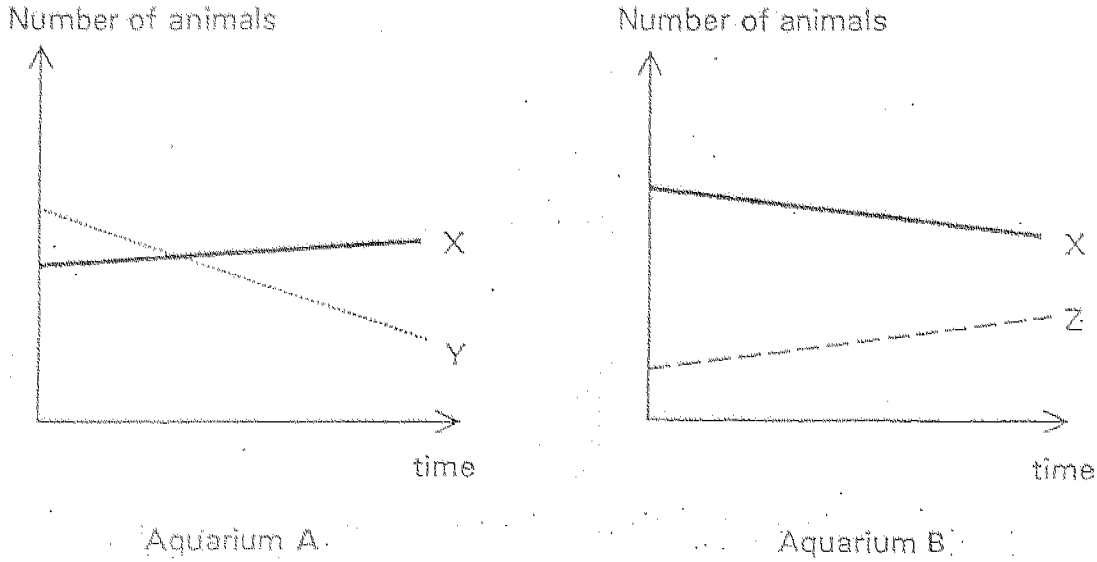



4)




22. Paul caught three different types of animals X, Y and Z from a pond and put them in two aquariums A and B. He put animals X and Y in Aquarium A and animals X and Z in Aquarium B. He also put some plants in both aquariums.

He counted the number of animals in the aquariums every week for a month. He did not see any dead animals in both the aquariums. His results are as shown in the graphs below.




From both the graphs, which one of the following shows correctly the food chain linking these three animals?

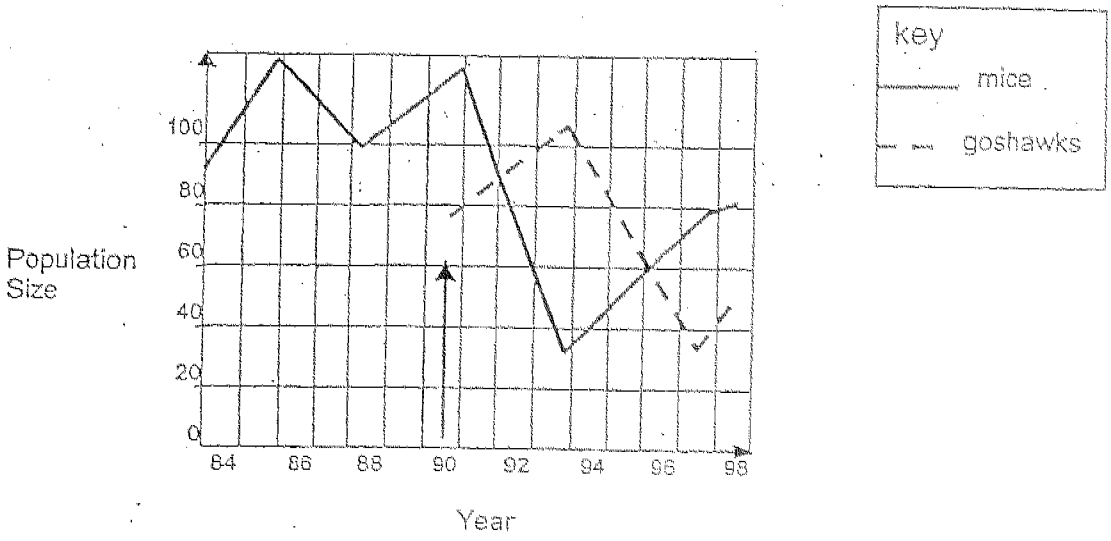
(1) X → Y → Z

(2) Y → X → Z

(3) Z → X → Y

(4) Z → Y → X

23. The graph below shows the population of mice and goshawks in a jungle. The goshawks, which eat mice, rabbits and small birds, first arrived in the wood in 1990. The mice eat seeds and buds.

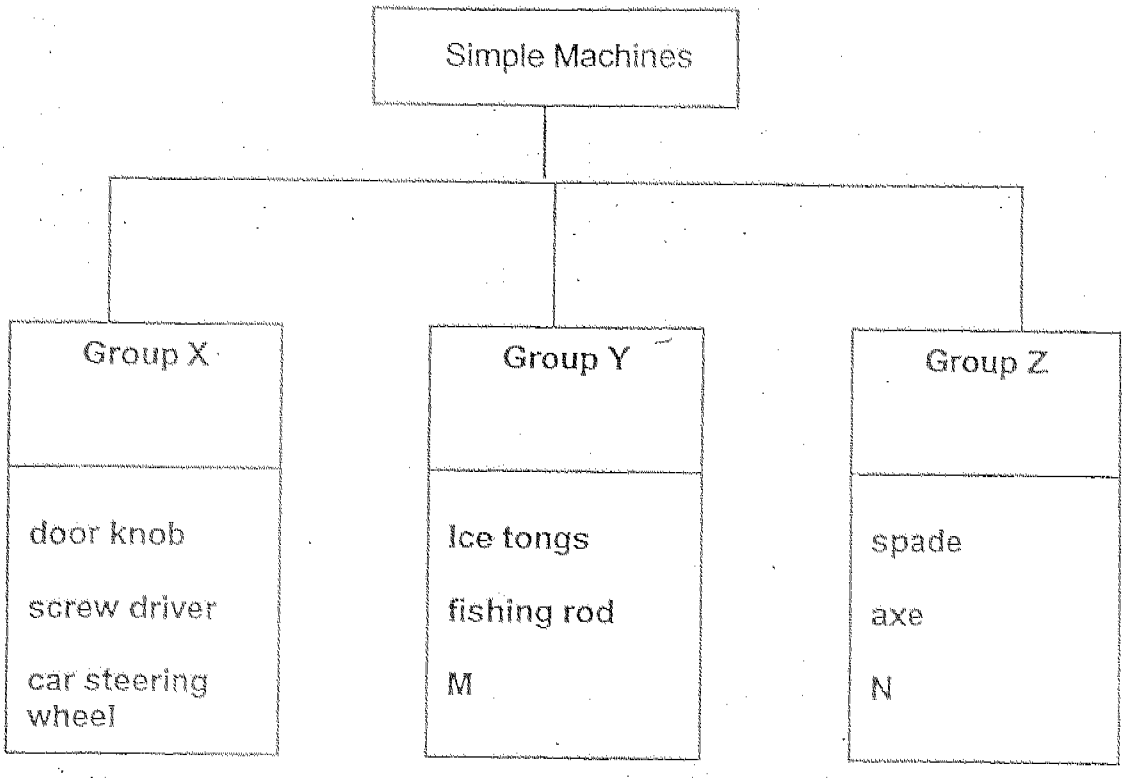



What could be the possible reason(s) for the changes in the mice population between 1984 and 1990?

A. The rabbits were eaten by the goshawks.
B. There were extreme changes in the weather.
C. There was a change in the population size of goshawks.
D. There was a change in the number of seeds and buds available.

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

24. Study the classification table as shown below.

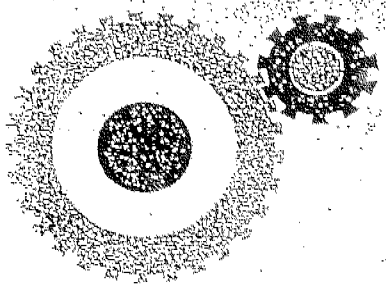



All the objects, including M and N are grouped according to the different types of simple machines. Which of the following statements are true?

A Object N can be a knife.
B Object M can be a broom.
C In Group Y, the effort used is smaller than the load.
D In Group X, the distance moved by the effort is greater than the distance moved by the load.

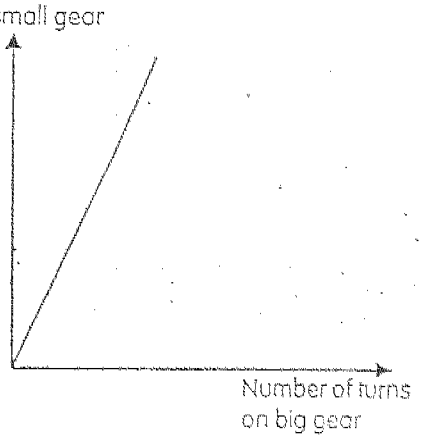
(1) A and C only
(2) C and D only
(3) A, B and D only
(4) A, B, C and D

25. The diagram below shows a big gear which is in contact with a smaller gear.

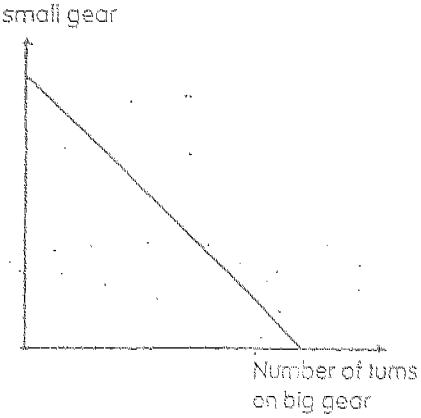


Which one of the graphs below shows the relationship between the number of turns a small gear and a big gear makes?

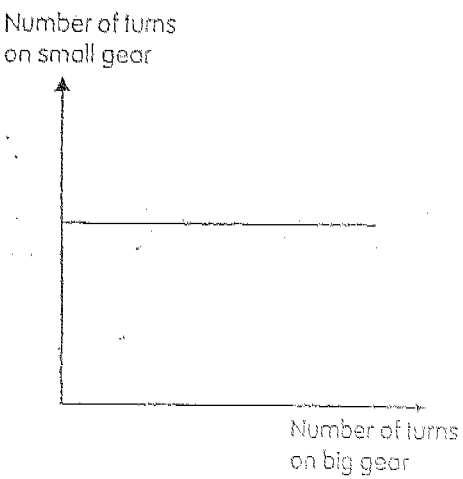
(1)



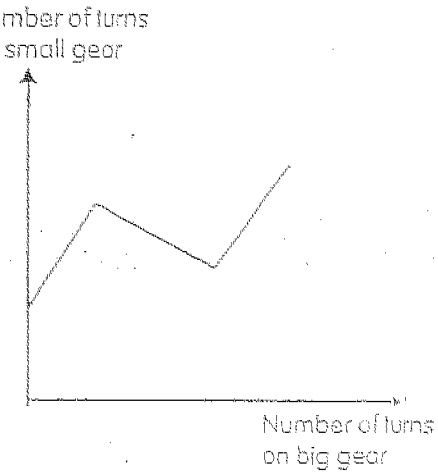

(2)



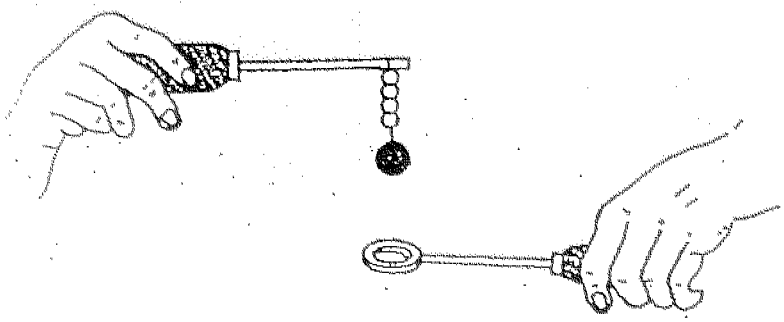

(3)




(4)



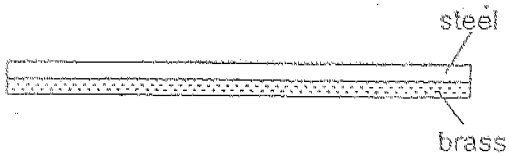
26. The picture below shows a metal ball and ring apparatus. The ring was big enough for the ball to pass through at the start of the experiment.



What should be done to the metal ball and ring apparatus to prevent the ball from passing through the ring?

(1) The ring should be dipped into hot water.
(2) The ball should be dipped into cold water.
(3) The ring should be heated over a bunsen burner.
(4) The ball should be heated over a bunsen burner.

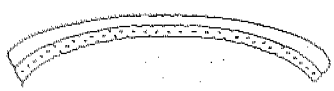
27. A bimetallic strip was made of 2 pieces of different metal; brass and steel, bonded together as shown below.



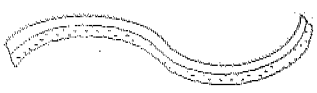

The initially straight bimetallic strip was then heated evenly in an oven for ten minutes. Given that brass expands more than steel, which one of the following diagrams shows the bimetallic strip after it had been heated?

(1)

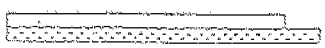
(2)



(3)



(4)



28. Study the diagram as shown below.


30 cm $^3$ of air was pumped into a metal container of volume 250 cm $^3$ through the inlet at point A. One minute later, 50 cm $^3$ of air was sucked out from the container through the outlet at point B.

What was the final volume of air in the container?

(1) 20 cm $^3$
(2) 30 cm $^3$
(3) 230 cm $^3$
(4) 250 cm $^3$

29. Jonathan brought out a bowl containing 5 ice cubes from the freezer. What should he do so that all the ice cubes would melt in the shortest possible time?

(1) Leave all the 5 ice cubes in a bowl.
(2) Spread sawdust over the 5 ice cubes.
(3) Crush them and spread the smaller pieces of ice cubes on a tray.
(4) Crush them and put the smaller pieces of ice cubes in a measuring cylinder.

30. In the forest, the rain tree obtains energy from the _____.

(1) sun
(2) rain
(3) fungi
(4) leaf litter

Section B (40 marks)

Write your answers to questions 31 to 46 in the spaces provided.
Marks will be deducted for misspelt key words.

31(a). Mrs Lim could pick up a dry glass with no problem. However, after she had applied some hand cream on her hands and tried to pick up the same glass, it slipped through her fingers.

Explain why the glass slipped through her fingers. (1 mark)

_____

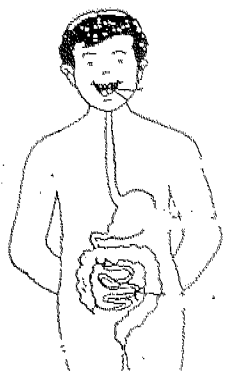
_____

(b). What must be present on Mrs Lim's fingers to enable her to hold the dry glass in the first place? (1 mark)

_____

_____

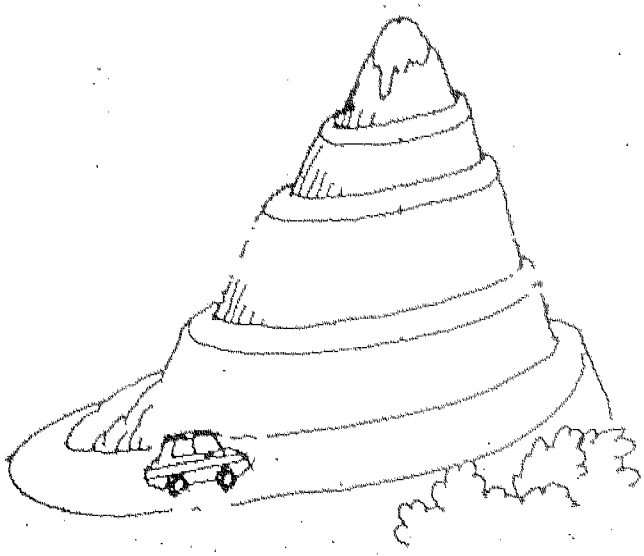
32. The diagram below shows the human digestive system.
Draw an arrow ( ⟶ ) and label the 3 parts of the digestive system where food is digested. (3 marks)



33(a). The diagram below shows a car going up a mountain.

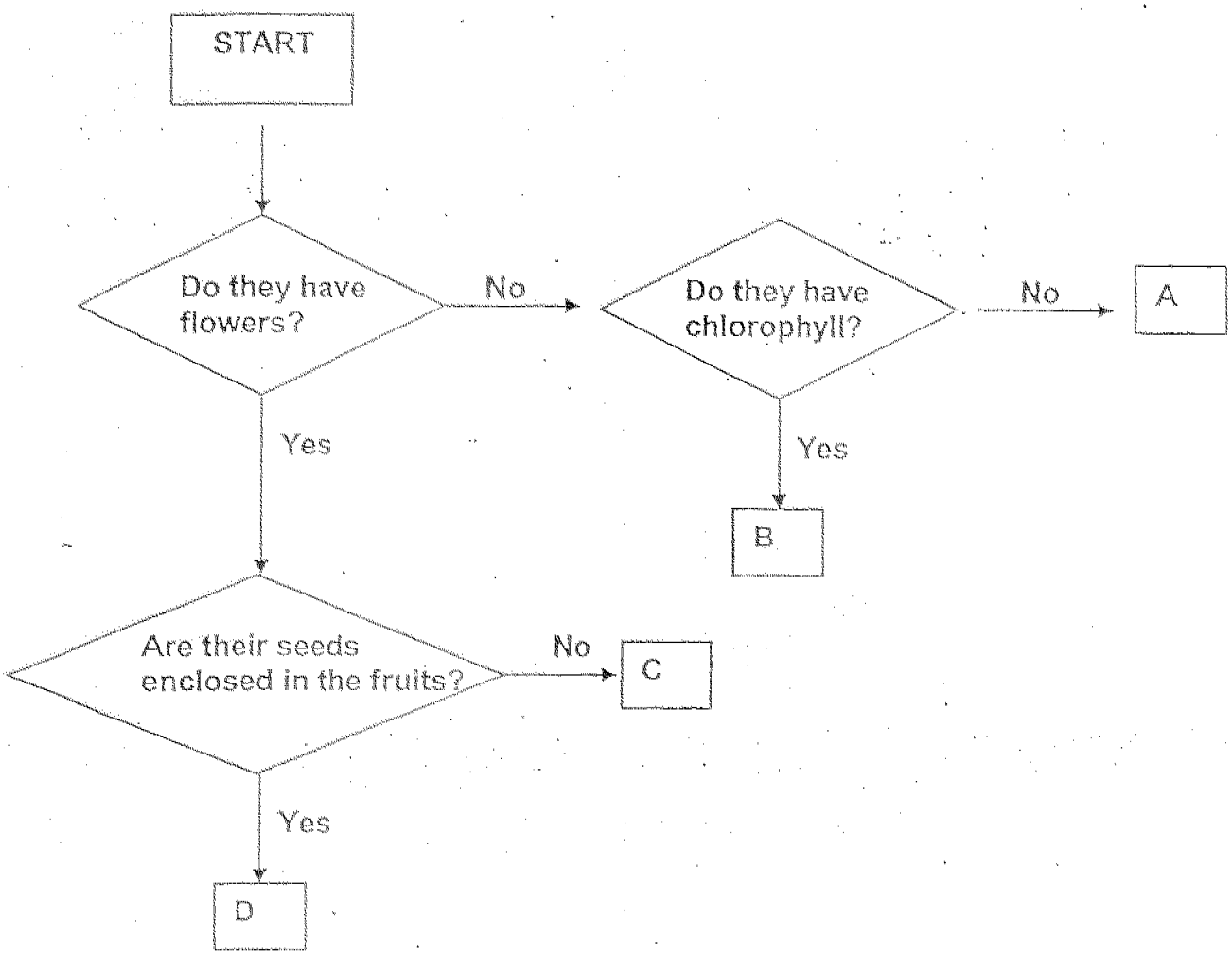
(i) Using an arrow labelled F, indicate where friction is experienced by the car. (1 mark)

(ii) Using an arrow labelled G, indicate where gravity is experienced by the car. (1 mark)



(b). Why is it more difficult for the car to go uphill than downhill? (1 mark)

34. Study the flowchart as shown below.




(i) Describe Plant C. (1 mark)

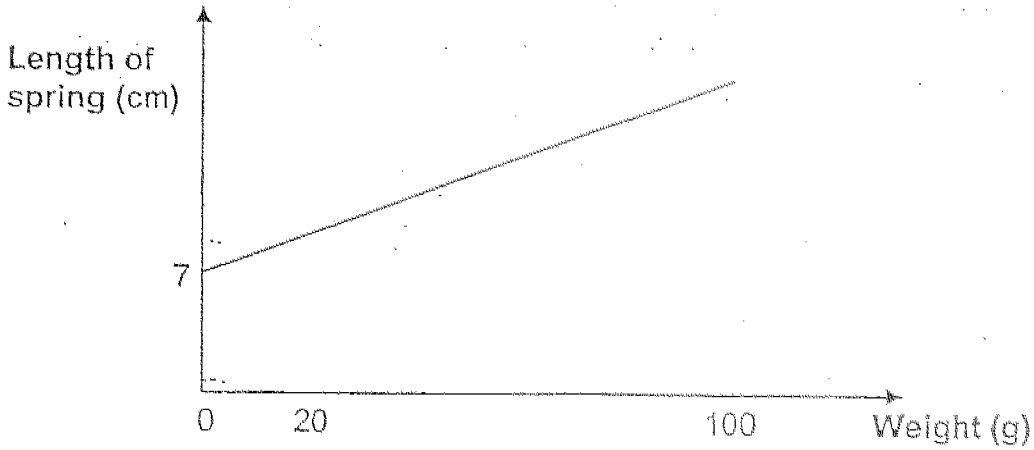
_____ _____ _____

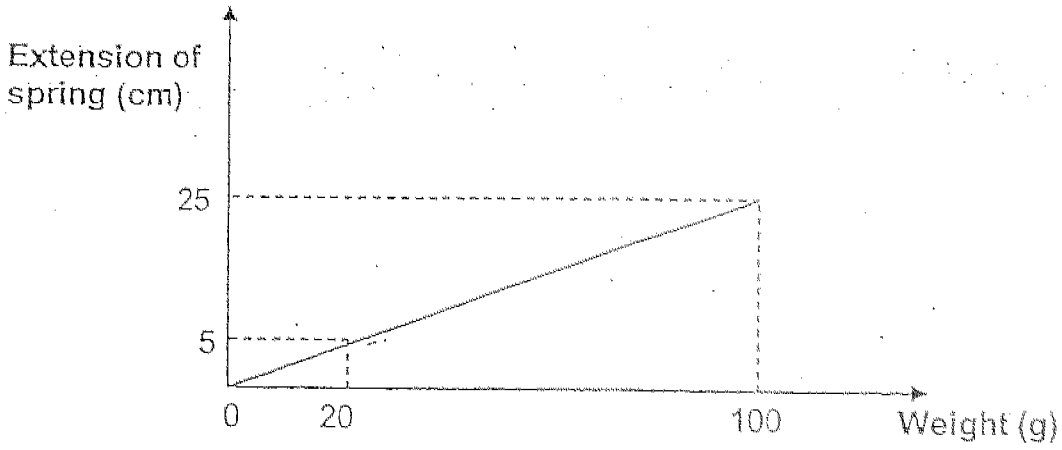
_____ _____

(ii) Complete the table below by writing the correct letter to each plant. (3 marks)

| Strawberry | Toadstool | Algae |
|---|---|---|
| | | |

35. Different weights were hung on the same spring and the results were recorded in the two graphs as shown below. The first graph shows the relationship between the length of the spring and the weight. The second graph shows the relationship between the extension of the spring and the same weight.



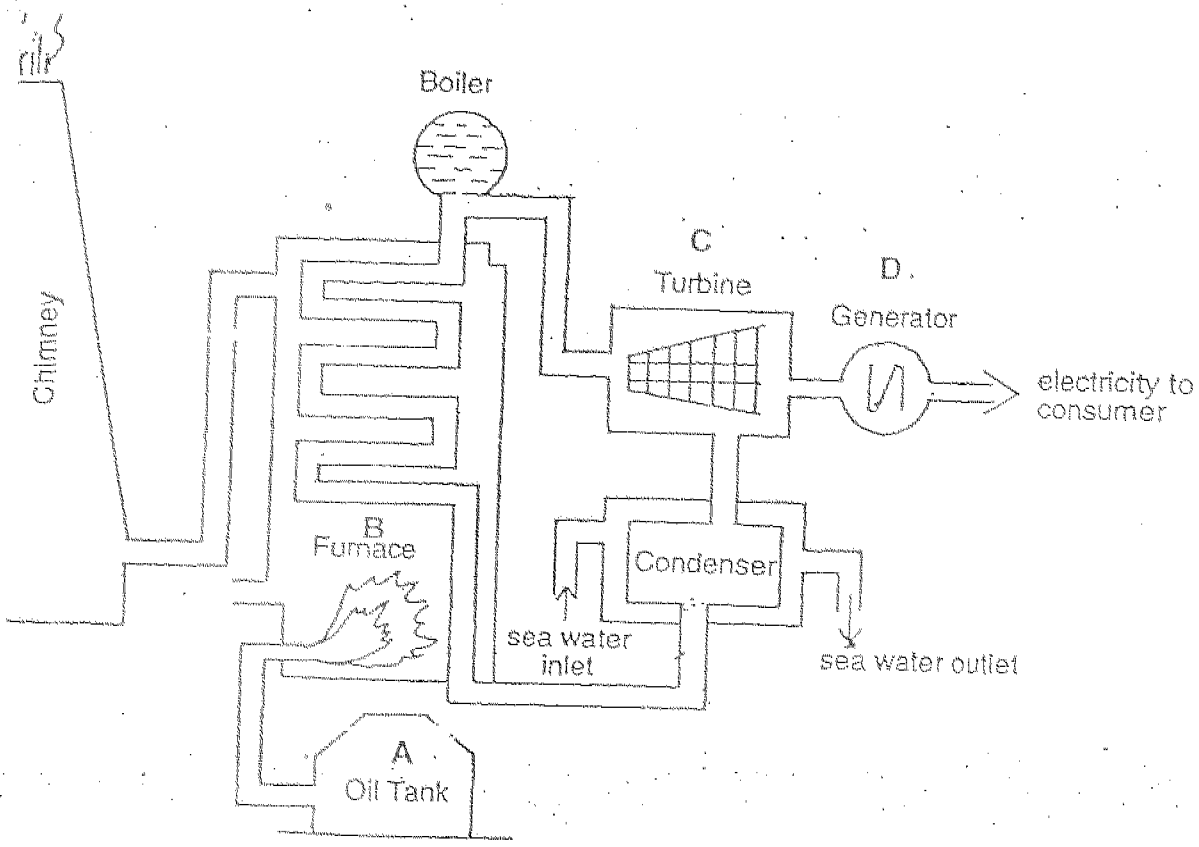

(i) What is the original length of the spring when there is no load? (1 mark)

_____

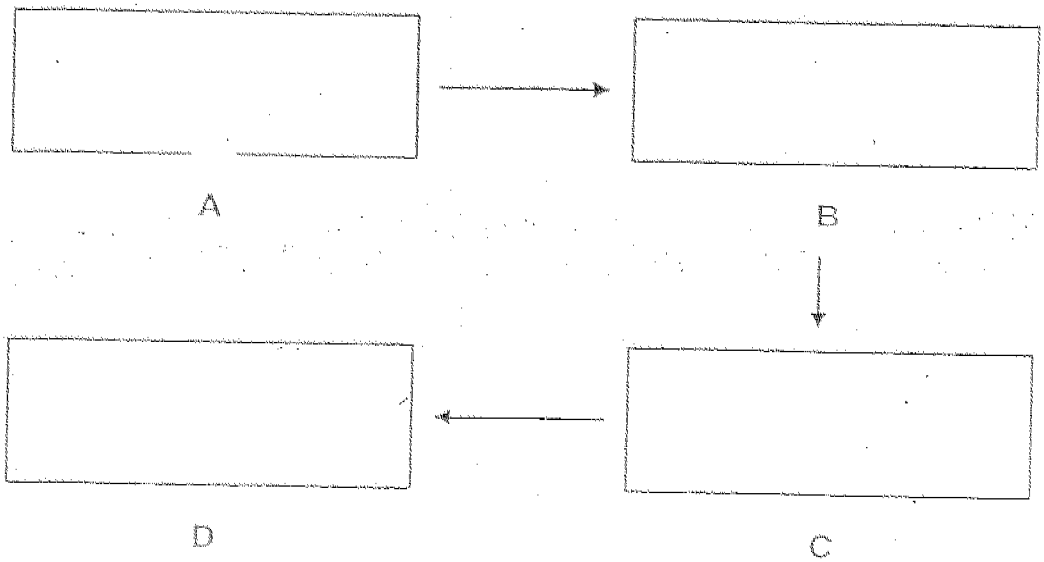
(ii) Find the length of the spring when a 70g weight is hung on the same spring. (1 mark)

_____

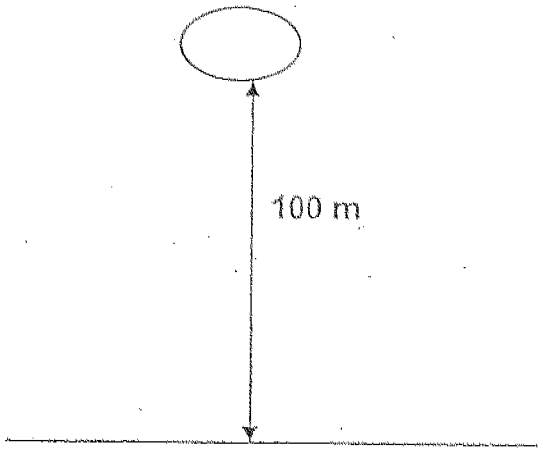
36. The diagram below shows how electricity is generated.



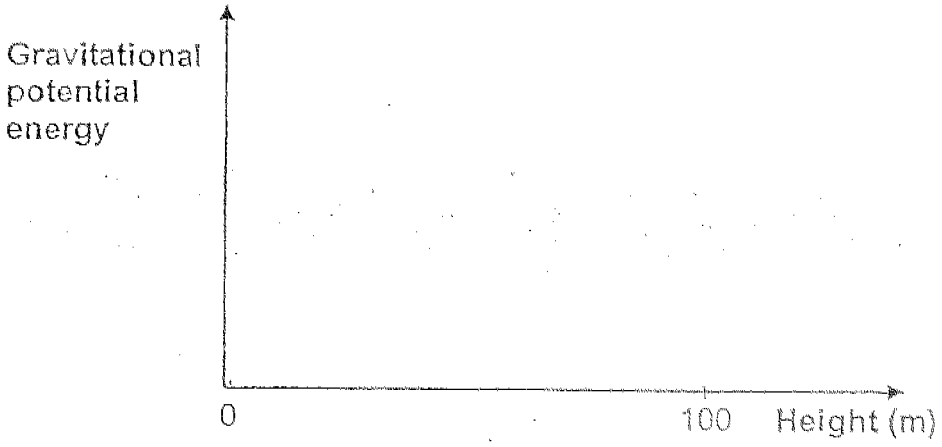

State the different forms of energy at Points A, B, C and D. (2 marks)



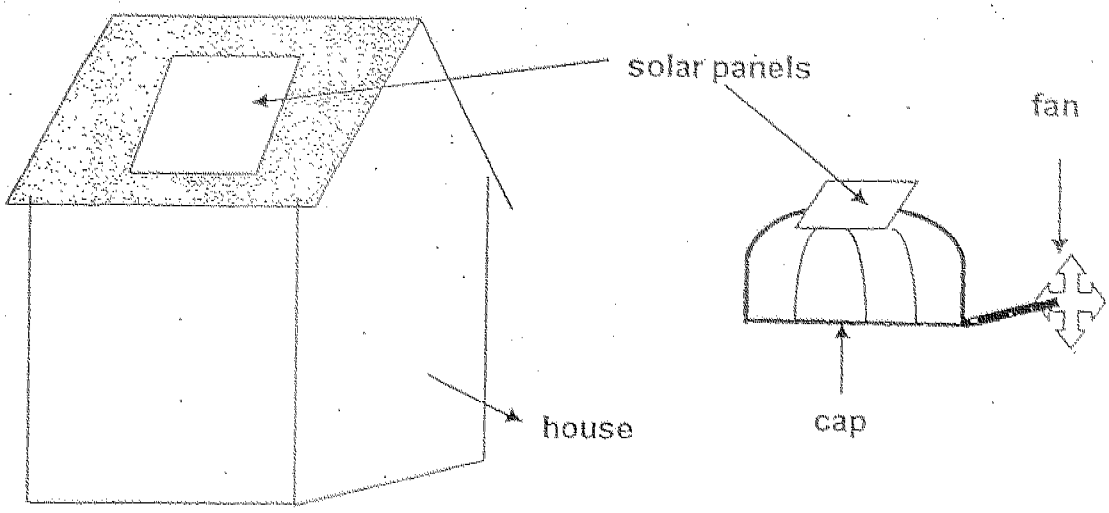
37. A rock was dropped from a height of 100 m.




Draw in the space below a graph to show the gravitational potential energy of the rock at different heights. (2 marks)



38. The diagram below shows 2 solar panels, one on the rooftop of a house and another on a cap to which a fan is attached.




State the energy conversion of the solar panels on the rooftop and that of the solar-powered cap. (2 marks)

(a) Solar panels on the rooftop:

_____

(b) Solar-powered cap:

_____

30

39. A group of primary six pupils wanted to find out the change in temperature in three different habitats. They measured the temperature at six-hourly intervals and recorded their findings in a table as shown below.

| Time | Temperature ($^0$C) | | |
|---|---|---|---|
| | Pond Habitat | Open field Habitat | Leaf-litter Habitat |
| 6 a.m | 24.0 | 23.1 | 25.1 |
| 12 noon | 29.6 | 32.5 | 27.0 |
| 6 p.m | 25.5 | X | 26.0 |
| 12 midnight | 24.3 | 25.0 | 24.9 |

(a) Which habitat has the smallest range of temperature change? (1 mark)

_____

(b) Explain how the habitat mentioned in (a) is able to maintain the smallest range of temperature. (1 mark)

_____

_____

_____

(c) Predict the temperature "X" in the open field habitat at 6 p.m. (1mark)

_____

40. Matthew wanted to find out whether duckweeds grow well in water containing bleach. He used two 500ml beakers for his experiment. The contents in beaker 1 are as shown in the table below. He set up a control using beaker 2.

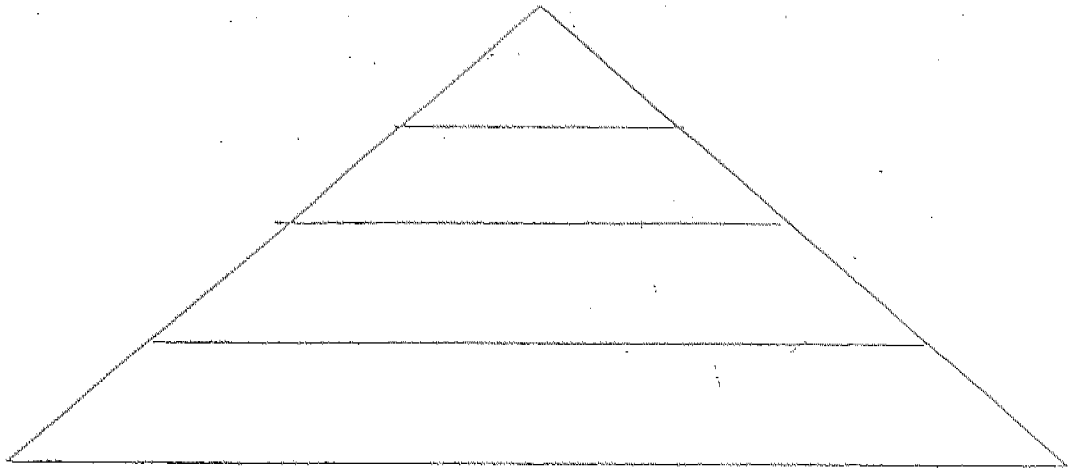
(a) Complete the table below to show how he should set up beaker 2. (1mark)

| | Bleach | Tap water | Duckweeds of the same size |
|---|---|---|---|
| Contents in Beaker 1 | 10 ml | 400 ml | 50 |
| Contents in Beaker 2 (control) | | | |

(b) What observation should he make in order to compare how well the duckweeds grow in the two beakers? (1mark)

41. Place the following food consumers and the food producer correctly in the food pyramid as shown below. (1 mark)

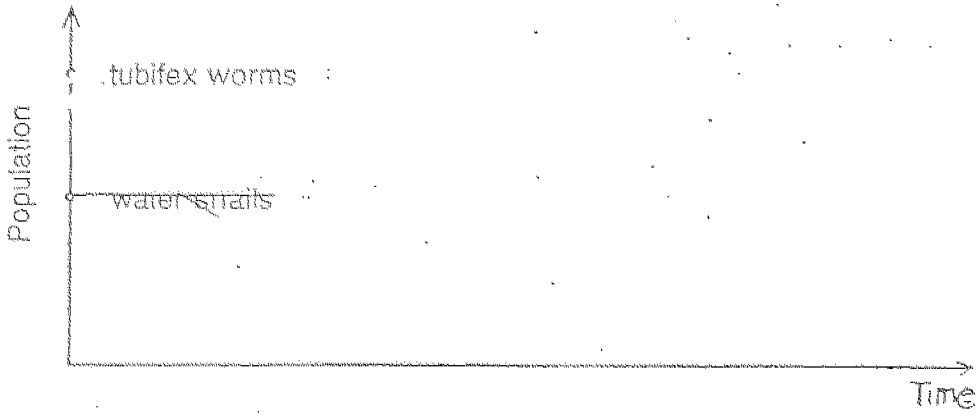
i. Grasshopper
ii. Snake
iii. Maize
iv. Mynah



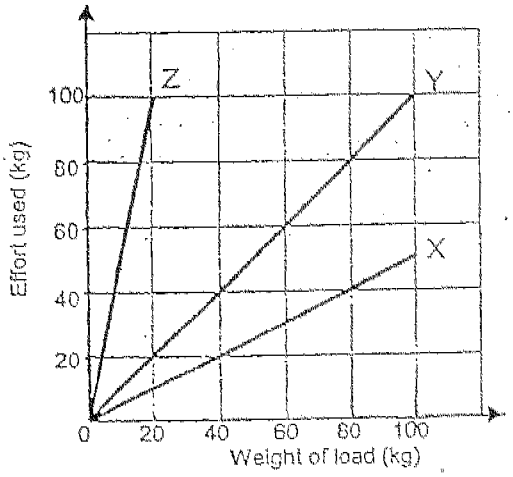
A deadly virus killed all the 3 populations of the animals above. Give 2 possible reasons why the population of maize would increase when all 3 populations of animals died. (2 marks)

| Reason(s) | Explanation |
|---|---|
| 1. | |
| 2. | |

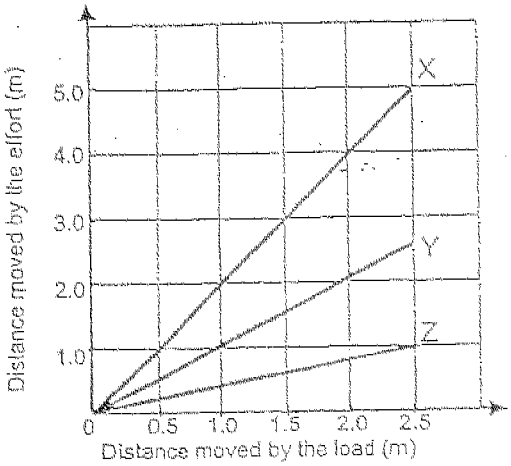
42. Florence put some guppies into a tank containing some water snails and tubifex worms. Draw a graph in the space provided below to show the change in the populations of the water snails and tubifex worms by the end of the day.
(2 marks)



43. Karen used three different simple machines X, Y and Z to move different loads. She recorded the weight of the load, the amount of effort used and the distances moved by the effort and load each time. Then she plotted the following graphs as shown below.




Graph (A)




Graph (B)

(a) Give an example of a simple machine that Y could represent. (1mark)

_____

_____

(b) Based on Graph (A), compare the amount of effort used when Machines X and Y were used to move the same load. (1mark)

_____

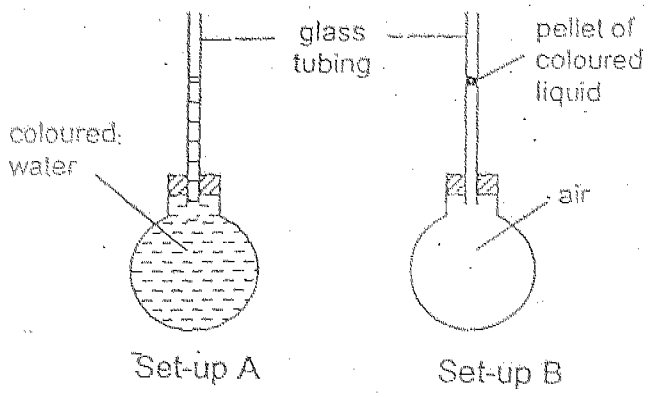
_____

(c) Which one of the above simple machines would Karen use if she wanted: (i) to do work faster and (ii) to carry heavy loads? (1 mark)

(i) To do work faster : Machine _____

(ii) To carry heavy loads more easily: Machine _____

44. In an experiment to compare the properties of water and air, two identical flasks were filled with water and air in the set-ups A and B as shown in the diagram below.




Set-ups A and B were then placed into a tank containing warm water at the same time. The water level in the glass tubing of Set-up A was seen to rise very slowly. The coloured pellet in Set-up B rose up the glass tubing very rapidly.

(a) What conclusion could be made from the above experiment? (1mark)

_____

_____

_____

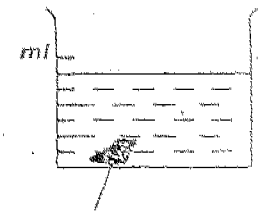
_____

(b) Suggest one change that could be made to Set-up A to speed up the rise of water level in the glass tubing? (1 mark)

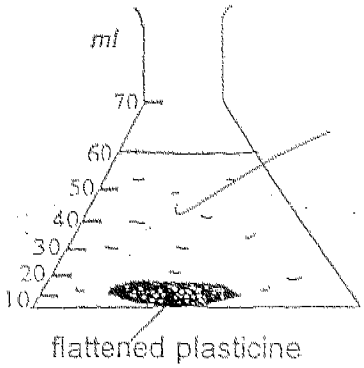
_____

_____

45. Jaime dropped a lump of plasticine into a beaker of water and found that the water level rose to the 60-ml mark. She then took the plasticine out of the water and flattened it. (Assuming no water was lost.)




(a) Later, she dropped the flattened plasticine into an empty flask, as shown below. If she poured the water from the beaker above into the conical flask, what would be the water level in it? Draw the water level in the flask below. (1mark)

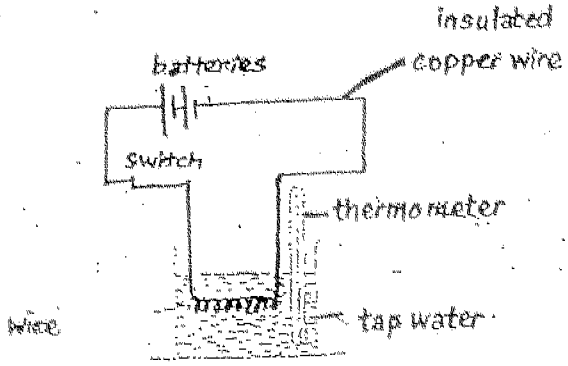



(b) What does this experiment show? (1mark)

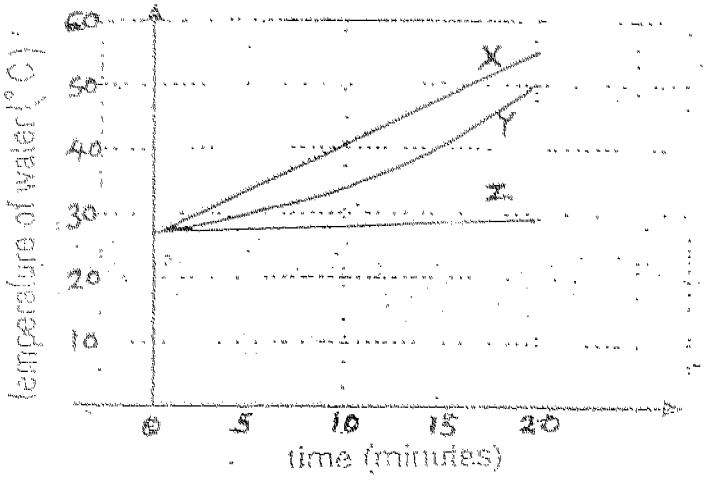
_____

_____

46. Sue used the set-up below to find out which wires, X, Y and Z, could heat up the water the fastest.




The temperature of the water was taken after every 5 minutes and the graph below shows the result of the experiment.




(a) What was the energy source in each set-up? (1mark)

_____

(b) Name two variables Sue must keep the same throughout the experiment to ensure a fair test. (2 marks)

(i): _____

(ii): _____

----------END OF PAPER----------

Setters: Ms Brenda Kok
Mrs Linda Tan

NANYANG PRIMARY SCHOOL
PRIMARY 6 SCIENCE
SEMESTRAL ASSESSMENT 1
2004

SA1

1) 2
2) 3
3) 2
4) 2
5) 3
6) 3
7) 2
8) 2
9) 2
10) 3
11) 4
12) 3
13) 4
14) 2
15) 2
16) 1
17) 2
18) 3
19) 2
20) 3
21) 1
22) 2
23) 3
24) 3
25) 1
26) 4
27) 1
28) 4
29) 3
30) 1

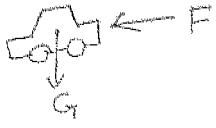
31) a) The handcream she used reduced the friction between her fingers and the glass.

b) The fingerprints

32) Mouth

Stomach

Small intestine

33) a) i) 


ii)

b) When the car goes uphill, it is working against Gravitational force and so more effort is needed.

34) i) Plant C has flowers and its seeds are enclosed in the fruits.

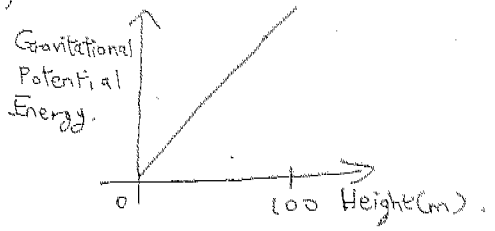
ii) C A B

35) i) 7 cm

ii) 24.5 cm

36) Chemical potential energy → Heat energy

Electrical energy → Kinetic energy

37) 

38) a) Solar energy ——— electrical energy

b) Solar energy ——— electrical energy ——— kinetic energy

39) a) Leaf litter habitat.

b) The fallen leaves form a shield to block out direct sunlight. The air in the leaf-litter habitat is stagnant.

40) a) 0 ml 410 ml 50

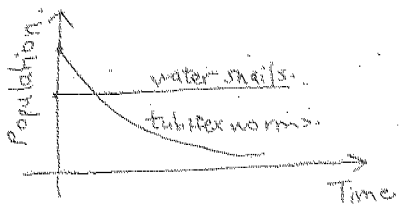
b) He should observe which container has the most number of duckweeds at the end of the experiment to compare how well the duckweeds grow in the two beakers.

41) Snake
Mynah
Grasshopper
Maize

i) The food consumers would decompose and become nutrients in the soil for the maize plsnts to grow.

ii) There are no plant eaters to feed on the maize plants.

42)



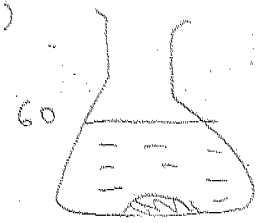

43) a) Y could be a fixed pulley.

b) The amount of effort used when Machine X was used for the same load.

44) a) Air expands faster than water when heated.

b) Use a narrower tube.

45) a)




b) It shows that a solid has a definite volume.

46) a) Batteries.

b) i) The number of batteries.

ii) The voltage of the batteries.