



**MARIS STELLA HIGH SCHOOL (PRIMARY)**

**PRELIMINARY EXAMINATION**

**SCIENCE**

**30 AUGUST 2005**

**BOOKLET A**

NAME: \_\_\_\_\_ (            )

CLASS: Primary 6 (            )

30 questions

60 marks

Total Time for Booklets A & B:      1 h 45 min

**DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.**

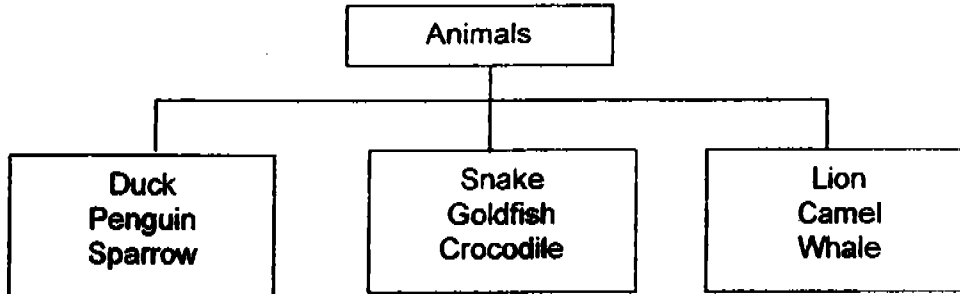
**FOLLOW ALL INSTRUCTIONS CAREFULLY.**

## PART I (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 (OAS).

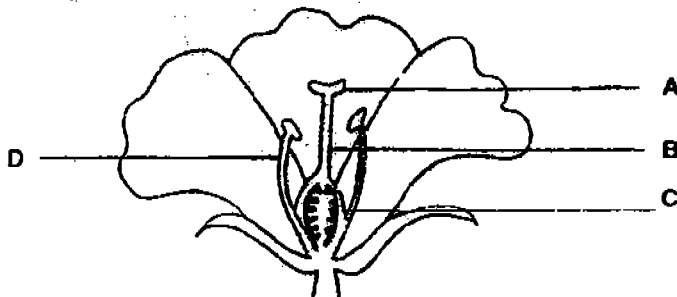
(30 x 2 marks)

1. Study the classification table below.



The organisms are grouped according to \_\_\_\_\_.

- (1) their habitat
  - (2) the food they eat
  - (3) the way they breathe
  - (4) their outer body covering
2. Which one of the following groups contains substances that come only from plants?
- (1) fur, sugar, cotton, leather
  - (2) herbs, cocoa, rope, leather
  - (3) charcoal, wool, wine, penicillin
  - (4) sugar, corn flakes, latex, timber
3. Study the cross-section of a flower shown below.

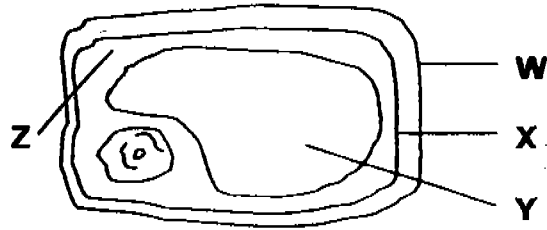


Which part of the flower will become the fruit?

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

4. The diagram below shows a plant cell. Which is the part that supports the cell, giving it a regular shape and holding it together with other plant cells?

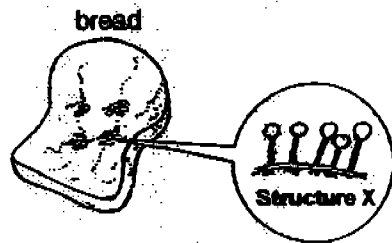
- (1) W
- (2) X
- (3) Y
- (4) Z



5. Clark, Lana and Chloe are trapped in a small lift during a power failure in Smallville. Which of the following shows how the amount of gases in the lift will change with time?

	Oxygen	Carbon Dioxide	Water Vapour
(1)	Increases	Increases	Increases
(2)	Decreases	Decreases	Increases
(3)	Decreases	Increases	Decreases
(4)	Decreases	Increases	Increases

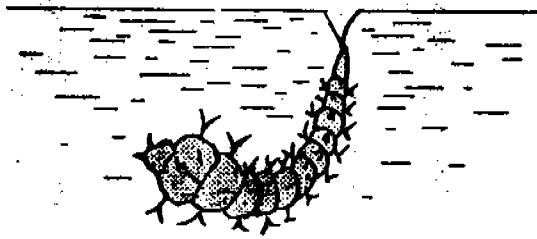
6. If you observe a piece of mouldy bread carefully with a magnifying glass, you will be able to see structure X, as shown in the diagram below, growing on it.



Which of the following statements about Structure X are correct?

- A It is a non-flowering plant.
  - B It reproduces through spores.
  - C It breaks down the bread into simpler substances.
- (1) A and B only
  - (2) B and C only
  - (3) A and C only
  - (4) A, B and C only

7. The animal shown below is usually found near the surface of a pond.

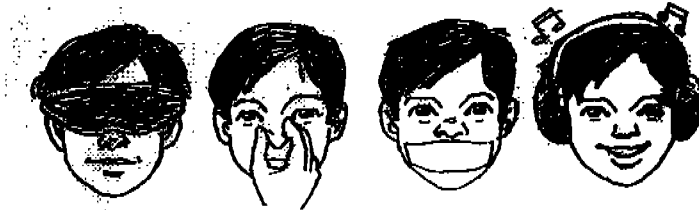


Which of the following are true of this animal?

- A It is a pest during its adult stage.
- B It spends its entire life cycle in the water.
- C It has the same number of stages in its life cycle as a grasshopper.
- D It stays near the pond surface as it cannot take in dissolved oxygen.

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

8. Look at the picture of 4 children below.



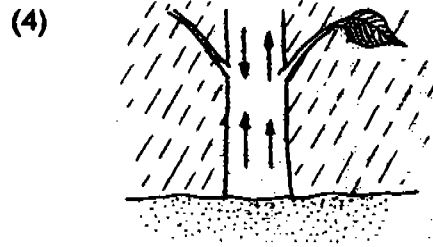
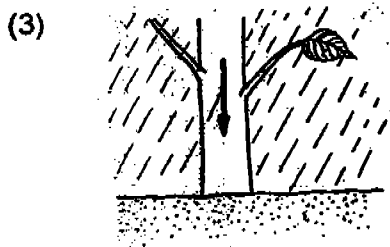
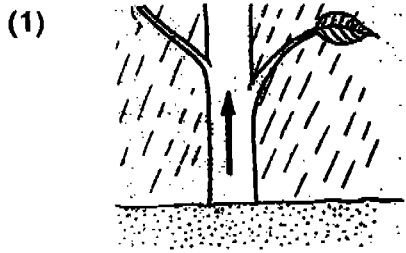
Based on the picture, which one of the following could all the children still be able to differentiate?

- (1) Whether the lilies give off a scent
- (2) Whether the drink is coffee or milk
- (3) Whether the watch is ticking or not
- (4) Whether the hibiscus is red or yellow

9. Plants are useful to Man because they help to purify the air.  
This purification process happens when \_\_\_\_\_.

- (1) plants respire
- (2) flowers develop into fruits
- (3) leaves make food for the plants
- (4) water is lost through the stomata

10. Which one of the following figures correctly shows the transportation of water in a plant on a rainy day?



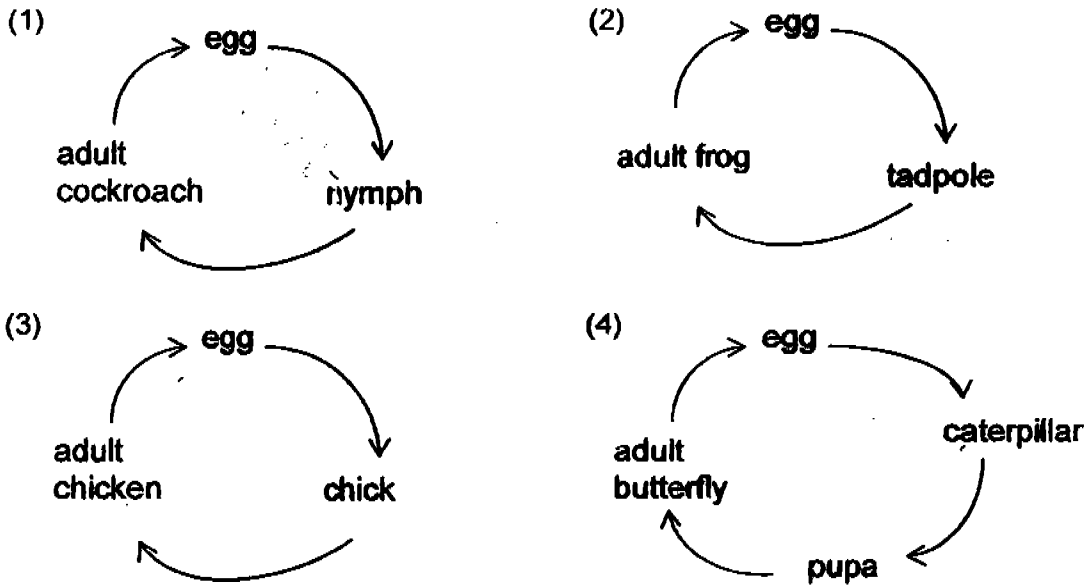
11. The table below shows the function of 4 different adaptations of an aquatic animal.

Adaptation	Function
P	To allow the exchange of gases.
Q	To propel its body forward.
R	To stay buoyant.
S	To overcome water resistance.

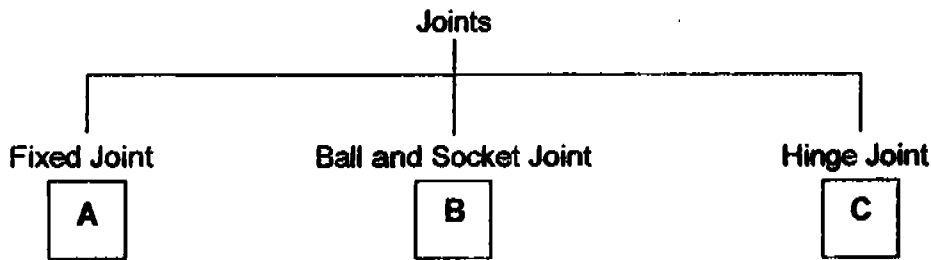
Which of the following correctly represents P, Q, R and S?

	P	Q	R	S
(1)	Gills	tail fins	swim bladder	streamlined body
(2)	Lungs	flippers	swim bladder	layer of fat
(3)	Lungs	swim bladder	flippers	streamlined body
(4)	Gills	streamlined body	layer of fat	flippers

12. Carissa did a study on an animal. The animal has six legs. Its young look very different from the adult. Which one of the following life cycles is most likely the life cycle of this animal?



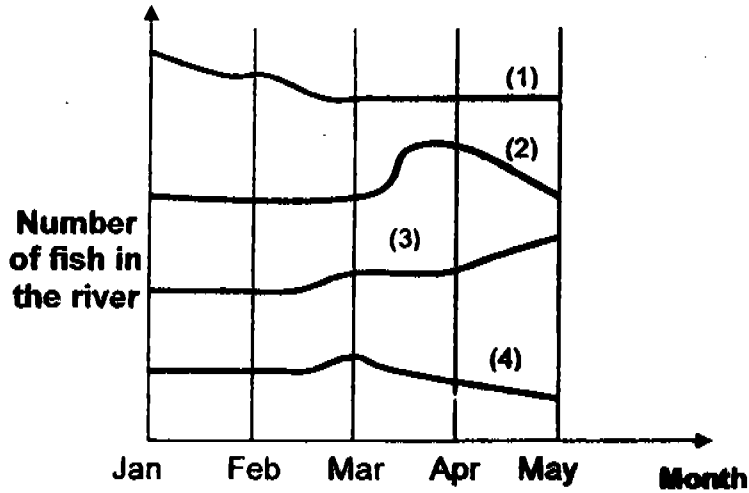
13. Study the classification table carefully.



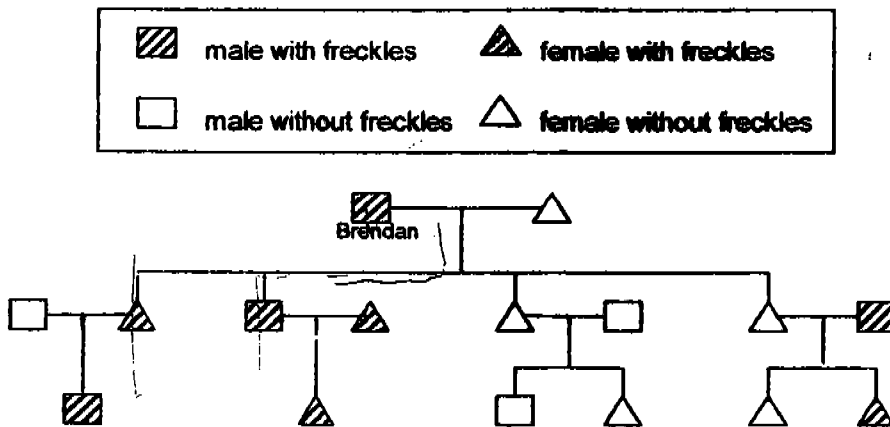
A, B and C represent different parts of our body where the joints mentioned can be found. Which one of the following correctly shows what A, B and C represent?

	A	B	C
(1)	skull	shoulder	knee
(2)	rib cage	skull	shoulder
(3)	backbone	knee	shoulder
(4)	backbone	rib cage	knee

14. The following graph shows the number of fish in four different rivers (1, 2, 3 and 4) over a period of four months. Which river most probably had a decrease in pollutants during the month of April?



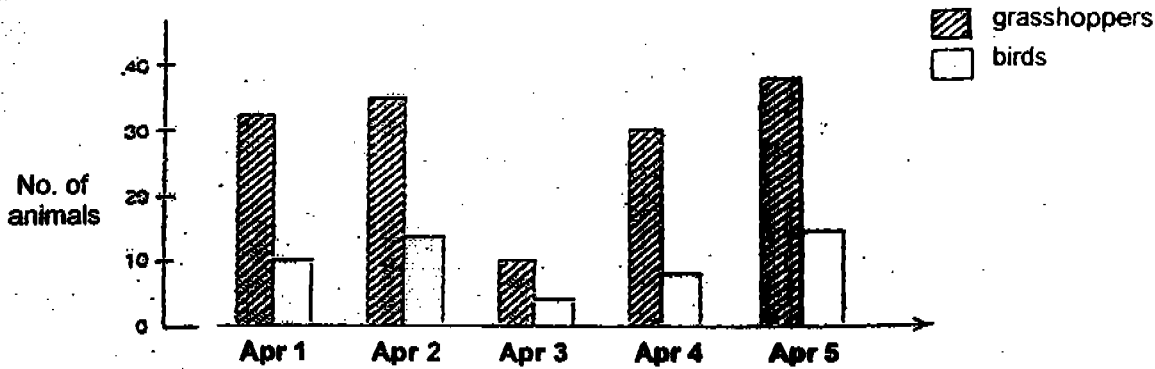
15. The family tree below shows the family members of Brendan who have freckles.



How many of Brendan's children have freckles?

- (1) 7
- (2) 2
- (3) 3
- (4) 4

16. A group of students counted the number of grasshoppers and birds in their school eco-garden over a period of 5 days. They also noted the weather on each day. The results are shown in the graph below.



Weather				
April 1	April 2	April 3	April 4	April 5
Cloudy	Sunny	Rainy	Cloudy	Sunny

Which of the following statements about the grasshoppers and birds is/ are true?

- A The birds are probably prey to the grasshoppers.
- B There are more grasshoppers when the weather is sunny.
- C The number of grasshoppers is always greater than the number of birds.
- D When the number of grasshoppers decreases, the number of birds increases.

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

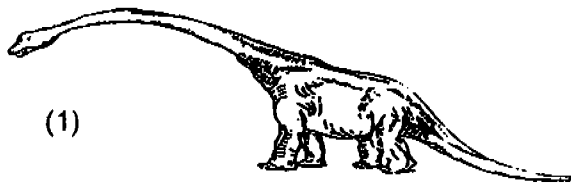
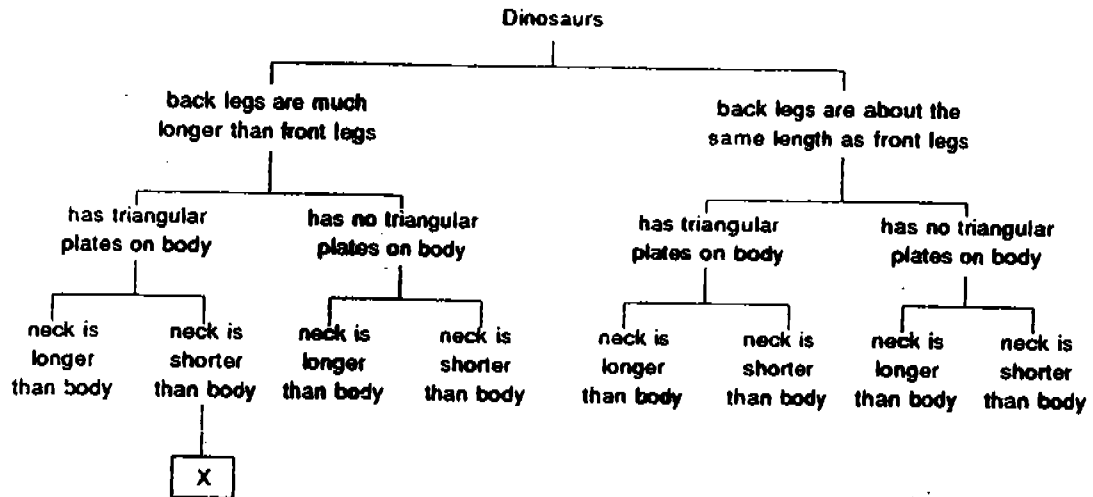
17. Which one of the following is an example of Man's positive impact on the environment?

- (1) ~~Cleaning~~ a forest to build factories
- (2) Introducing untreated sewage into the near rivers
- (3) Building tall chimneys that filter smoke before discharge
- (4) Dumping chemicals into rivers that are far away from residential areas.

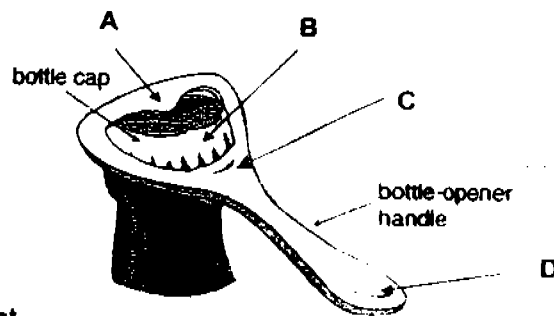


18. Study the classification table.

Which one of the dinosaurs shown in the pictures below should be placed in box X?



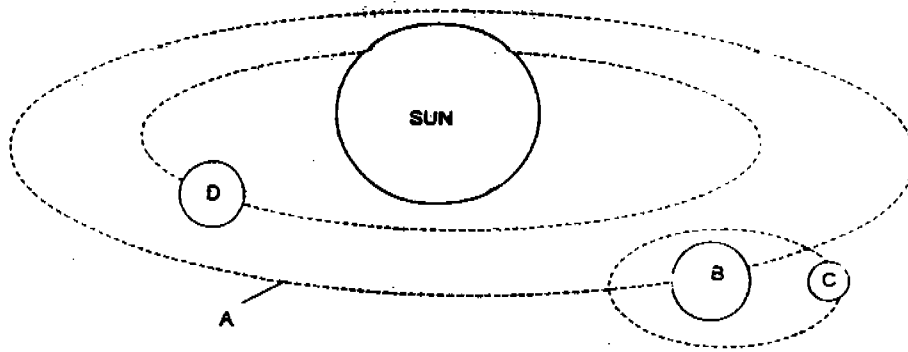
19. Look at the picture below.



The position of the fulcrum is at \_\_\_\_\_

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

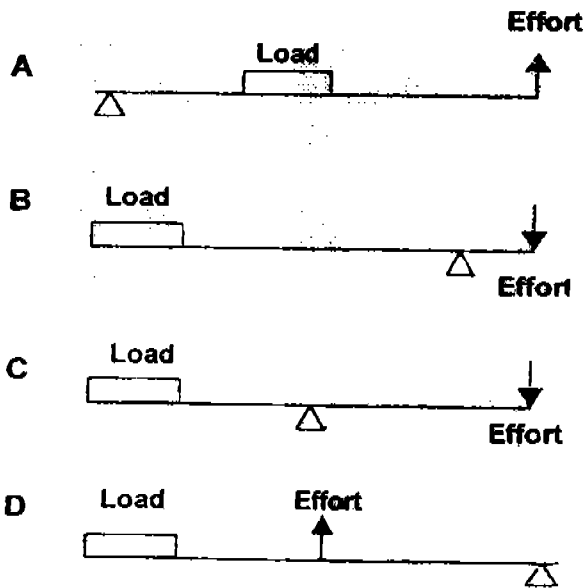
20. Study the diagram below.



Which one of the following is true?

- (1) D is not a planet.
- (2) B is the satellite of C.
- (3) B revolves around the Sun.
- (4) D is also able to travel on orbit A.

21. The following levers are used to lift a load of 10 kg.

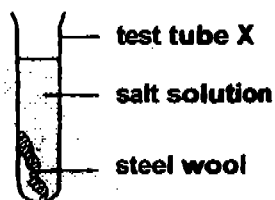


Which setup requires the least effort to lift the load?

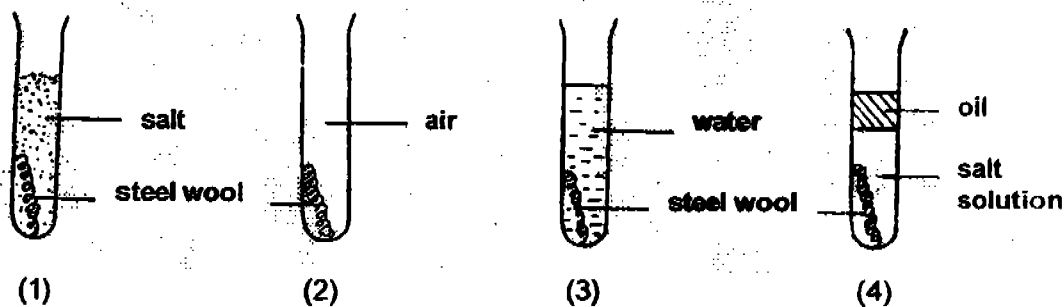
- (1) A
- (2) B
- (3) C
- (4) D

22. When a rubber seed is rubbed on the floor continuously for 10 seconds, a change of energy takes place. Which one of the following correctly describes the energy change?
- (1) Kinetic energy is changed to sound energy.
  - (2) Potential energy is changed to sound energy.
  - (3) Kinetic energy is changed to heat and sound energy.
  - (4) Potential energy is changed to kinetic and sound energy.

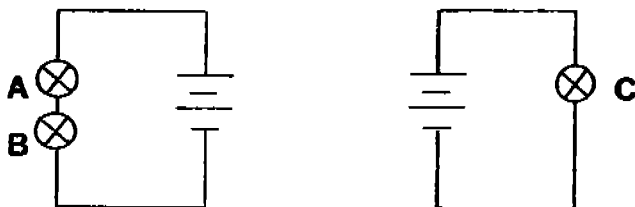
23. Brendan wants to find out if steel wool rusts faster in water when salt is added to it. He prepared some salt solution by dissolving salt in water.



Which one of the following test-tubes should he use to compare with test-tube X?



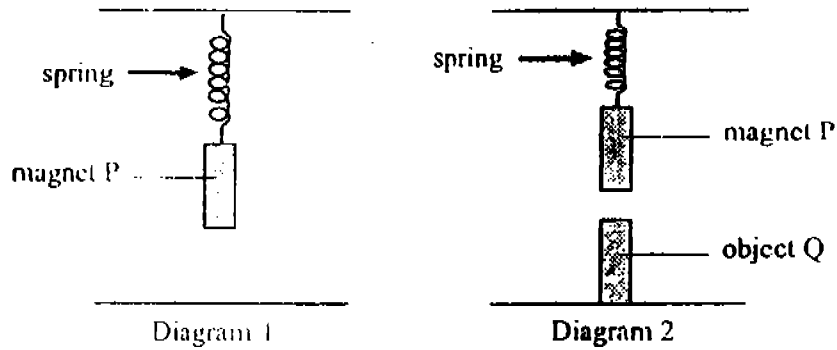
24. Carmen set up two circuits using 3 identical bulbs and 4 batteries as shown in the diagrams below.



Based on the circuits, which one of the following statements is true?

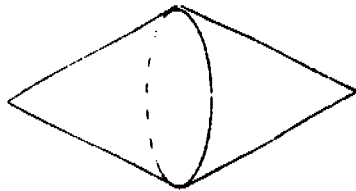
- (1) Bulb A glows as brightly as Bulb B.
- (2) Bulb B glows more brightly than Bulb C.
- (3) If Bulb B fuses, Bulb A will continue to light up.
- (4) If Bulb A fuses, Bulb B will glow as brightly as Bulb C.

25. Diagram 1 below shows a magnet hung from a spring. Diagram 2 shows what happened when an object Q was placed directly below it.

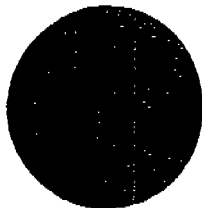


Based on the diagrams, which of the following statements about object Q is true?

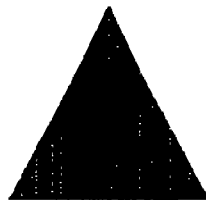
- (1) It is a magnet.
  - (2) It is an iron bar.
  - (3) It is a non-metal.
  - (4) It could be copper.
26. 2 opaque cones are stuck together at the base to form the structure below.



Which of the following shadows can be formed by the structure?



A



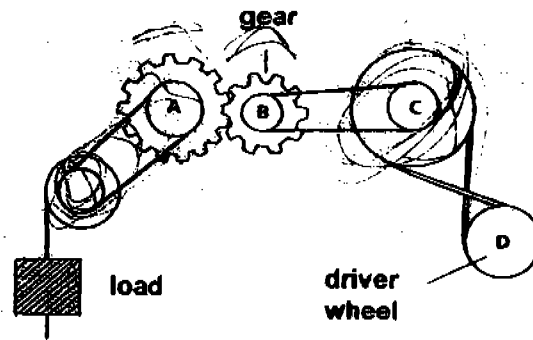
B



C

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

27.

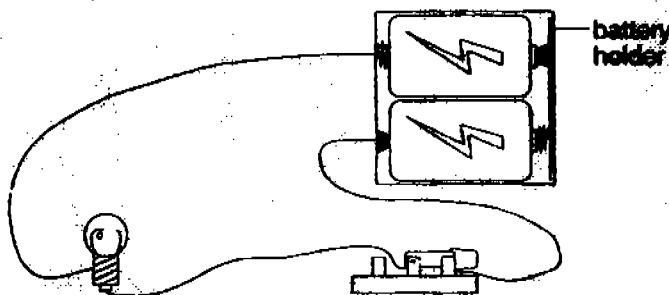


Which of the following statements about the system above are true?

- A It is made up of gears and pulleys.
- B B turns faster than A as it is smaller.
- C When C turns clockwise, the load moves down.
- D This system is able to change the speed of motion.

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

28. The circuit in the diagram below is open.



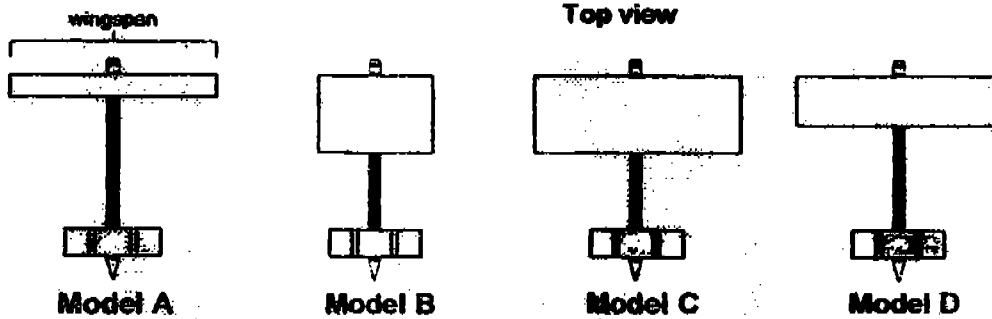
Based on the diagram, which of the following are likely causes of the open circuit?

- A The filament in the bulb is broken
- B The dry cells are wrongly arranged.
- C The switch is not in the "on" position.
- D The battery holder is made from an insulating material

- (1) A and B only
- (2) A and D only
- (3) B, C and D only
- (4) All of the above

29. Ken constructed 4 model planes A, B, C and D as shown in the diagrams below.

In order to carry out a fair test, which of the 4 planes should he use to test the effect of wingspan on the distance the planes travelled?



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

30. Four identical towels were dipped in water and left to dry in the conditions shown below. A tick (✓) means that the condition is present. Which towel would most probably be dry in the shortest time?

Towels	Hot sun	Wind	Humid air	Cool air
(1)				
(2)				
(3)				
(4)				



**MARIS STELLA HIGH SCHOOL (PRIMARY)**  
**PRELIMINARY EXAMINATION**  
**SCIENCE**  
**30 AUGUST 2005**

**BOOKLET B**

NAME: \_\_\_\_\_ (            )

CLASS: Primary 6 (            )

16 questions

40 marks

Total Time for Booklets A & B:     1 h 45 min

**DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.**

**FOLLOW ALL INSTRUCTIONS CAREFULLY.**

**Booklet A : \_\_\_\_\_ / 60**

**Booklet B: \_\_\_\_\_ / 40**

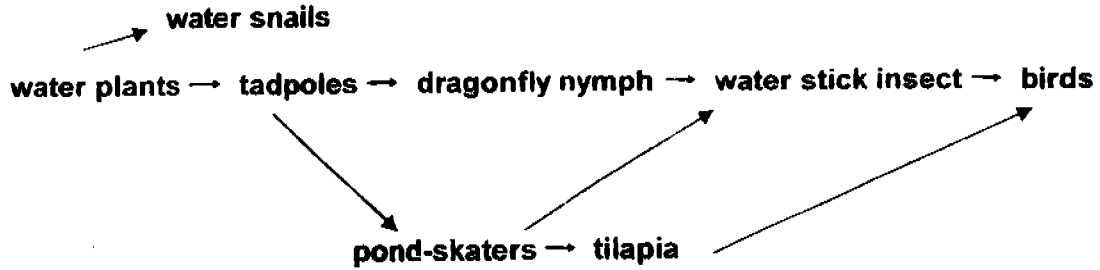
**Grand Total: \_\_\_\_\_ / 100**

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

**PART II**

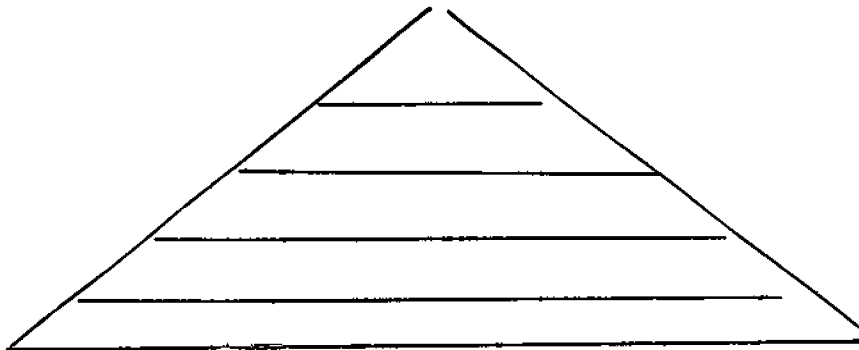
For questions 31 to 46, write your answers in this booklet. The number of mark available is shown in brackets [ ] at the end of each question or part question. (40 marks)

31. The diagram below shows food relationships within a pond community.

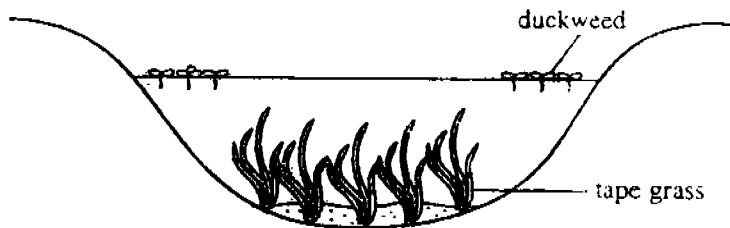


(a) Based on the food web, arrange the following organisms in the food pyramid shown below. [1]

tadpoles    tilapia    water plants    pond-skaters



(b) The pond shown in the diagram below is about 1 metre deep. There is an abundance of nutrients for the water plants and the water is clear.



How would an increase in duckweed plants affect the tape grass population?  
Explain your answer. [1]

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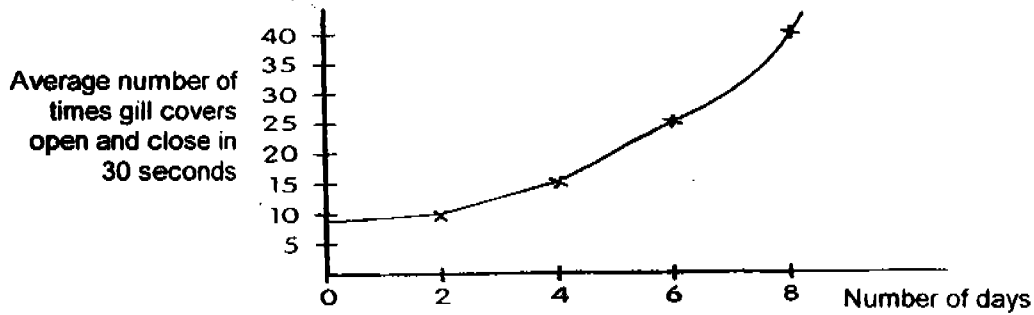


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5



32. Jeremy conducted an experiment with a goldfish in a tank without changing the water. The following graph was obtained with measurements from the experiment.



(a) Besides the fish tank and the amount of water, state two other variables that Jeremy had to keep constant for the experiment to be fair.

Variable 1: \_\_\_\_\_

Variable 2: \_\_\_\_\_

(b) What pattern can you observe between the average rate of gill cover movement and the number of days where the goldfish remained in the tank? [1]

\_\_\_\_\_

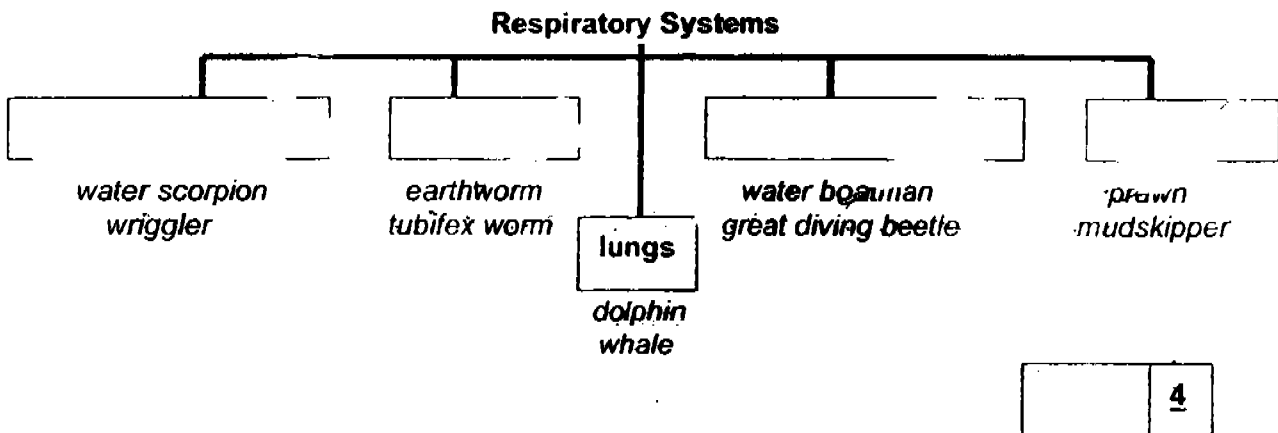
\_\_\_\_\_

(c) Explain what might have caused the pattern that you observed in the graph. [1]

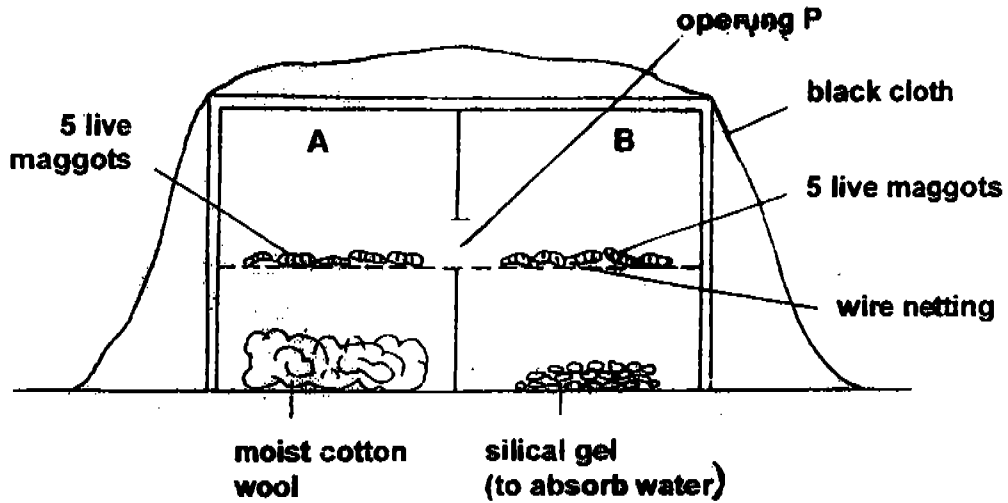
\_\_\_\_\_

\_\_\_\_\_

(d) Complete the classification chart below by filling in the respiratory systems of the groups of animals. One of the boxes is filled for you. [1]



33. A group of pupils set up an experiment as shown below to find out how maggots respond to their environment.



The box is divided into 2 parts, A and B. The live maggots can move from one part to another through a small opening P.

- (a) What is the physical environmental factor that the pupils are investigating? [ $\frac{1}{2}$ ]

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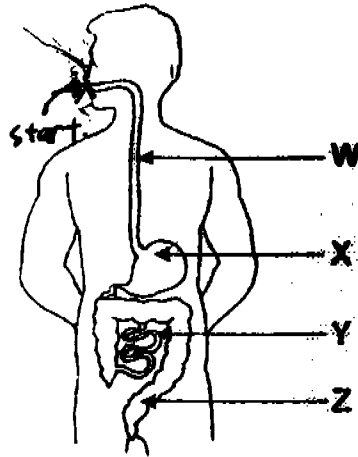
- (b) After a while, the pupils observed that all the maggots have moved into part A. Based on the setup and their observations, what can the pupils conclude about the preferred living conditions of the maggots? [1]

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- (c) In which natural habitat would maggots most likely be found? [ $\frac{1}{2}$ ]

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34. The diagram below shows the human digestive system.



(a) Label on the diagram where the process of digestion begins. [ $\frac{1}{2}$ ]

(b) Explain what happens to the process of digestion if Y is unable to carry out its function(s) effectively. [1]

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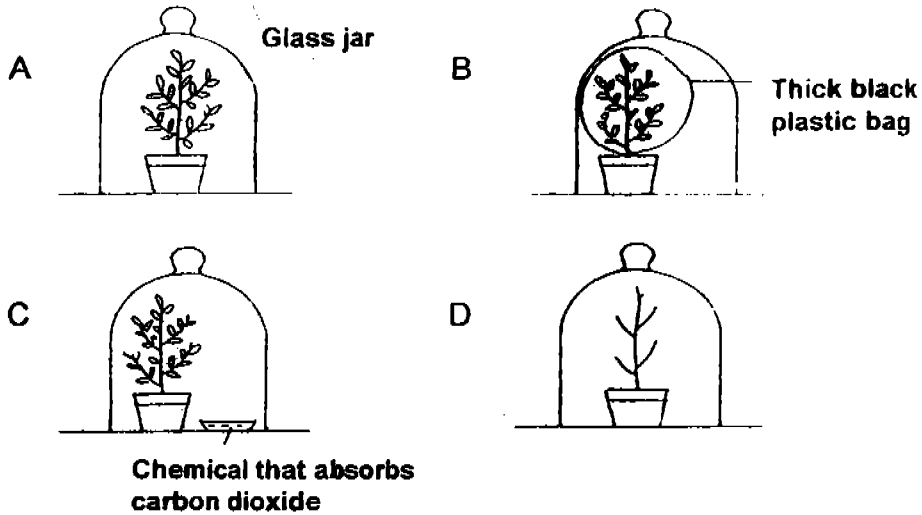
(c) Into which system does digested food go when it leaves the digestive system? [ $\frac{1}{2}$ ]

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	2
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35  
(a)

4 potted plants are exposed to different conditions within 4 similar glass jars. The jars are all placed in the garden.



Which plant is likely to test positive for the presence of starch after a few days?  
Explain your choice.

[1]

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(b) Some manufacturers of face cream are suspected of mixing flour into the cream. You are given 4 samples of face cream from different manufacturers. Describe what could be done to confirm that they do not contain flour.

[2]

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36. Look at the food chains listed below

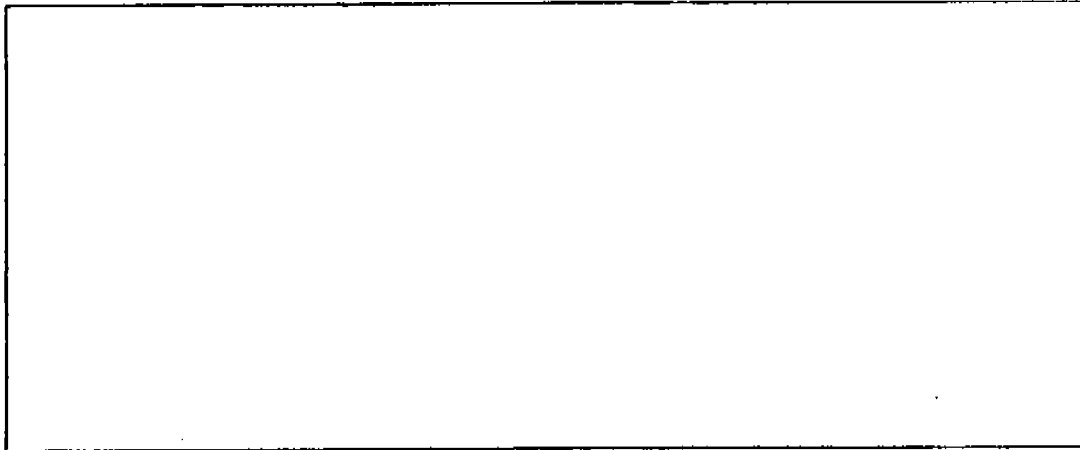
plant → caterpillar → crow → snake

plant → caterpillar → frog → snake

plant → grasshopper → crow → snake

plant → rat → snake

(a) Based on the food chains given above, construct a food web in the box below. [1]



(b) Crows are regarded as pests and the shooting of crows is carried out regularly. Explain the long-term effect of this activity on the population of plants [1]

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	<u>2</u>
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(Go on to the next page)

37. Look at the pictures of the animals below.



Animal A



Animal C



Animal B



Animal D

(a) Which animal is not an insect? [1]

\_\_\_\_\_

(b) Give two reasons to support your answer in (a) above. [2]

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

(2) \_\_\_\_\_

(c) State the conditions needed for decomposition to occur when these organisms die. [2]

\_\_\_\_\_

\_\_\_\_\_



39.

(a) Anne noticed a thin layer of water on the outside of a packet of frozen chips that she had taken out from the freezer.

i) Explain where the layer of water came from. [1]

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ii) Study the list below. Put a tick (✓) next to the ones where a layer of water would also be seen due to the same reason as (i). [1]

- (a) on the outside of a cup of hot tea
- (b) on the outside of a cold drink on a hot day
- (c) on a bathroom mirror
- (d) on the outside of a car in the rain

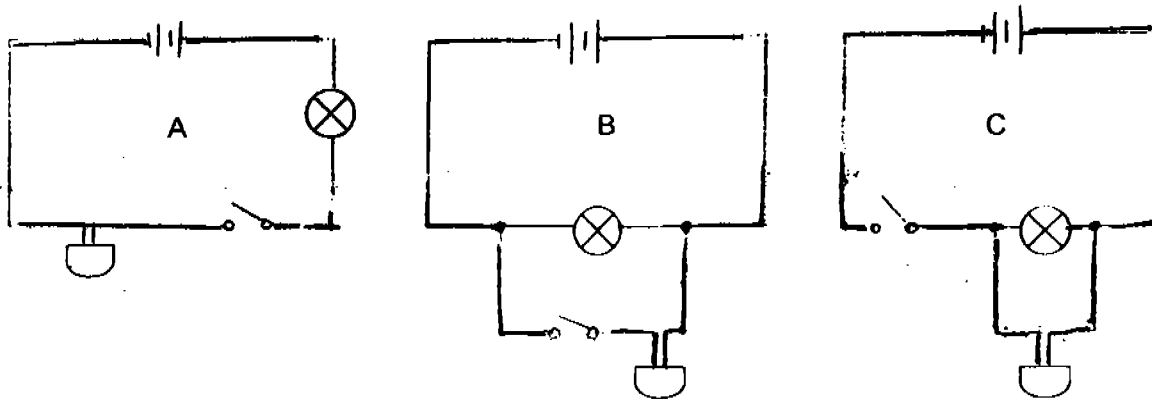

(b) Water can be conserved through reducing, reusing and recycling. Tick (✓) in the correct box to show how water is conserved for each situation given. [2]

Situations	Ways to conserve water		
	reduce	reuse	recycle
(i) Repair a leaking tap immediately.			
(ii) Purify sewage water to get drinking water.			
(iii) Avoid washing the car under a running hose.			
(iv) Water the plants using water from the aquarium.			

	<u>4</u>
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40. The following circuits were made using switches, bulbs and bells.



(a) Which circuit can switch both bulb and bell on and let the bell sound even when the bulb is removed? [ $\frac{1}{2}$ ]

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(b) Which circuit allows the bell to be switched on and off and the bulb to stay on all the time? [ $\frac{1}{2}$ ]

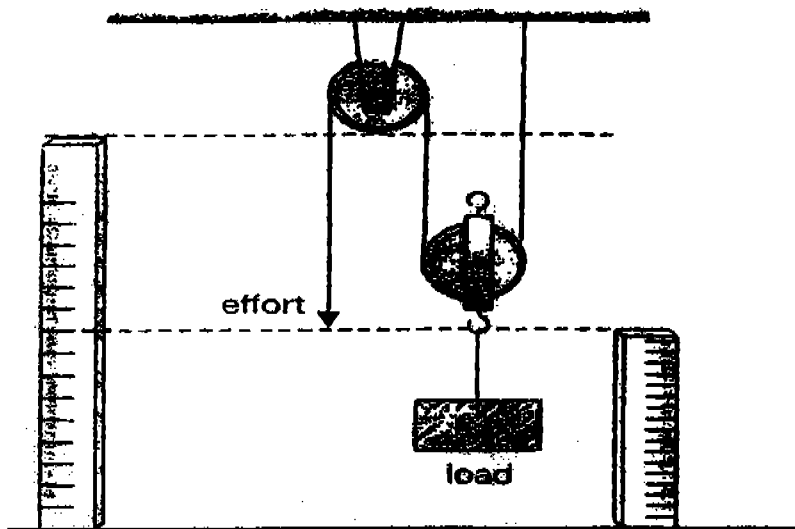
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(c) Write down the energy change that takes place when the circuit in (b) is closed. [1]

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	2
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41. A group of students carried out the following experiment using the pulley system as shown below. They applied a force over different distances to lift a load. They recorded the results as shown in the table below.



Distance moved by the effort	Distance moved by the load
6 cm	3.5 cm
15 cm	8 cm
20 cm	10 cm

- (a) From the results, state two relationships that can be observed about the distance moved by the effort and the distance moved by the load. [1]

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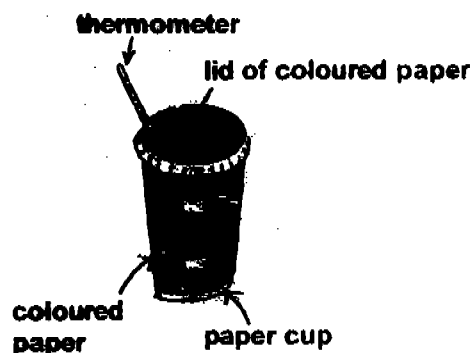
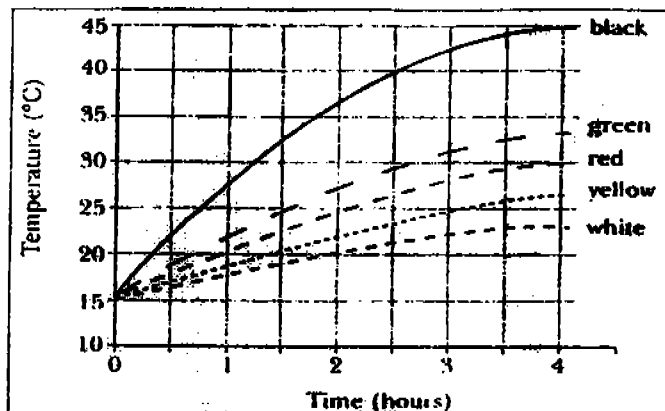
- (b) How does the above pulley system make work easier?

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- 42(a) Five similar paper cups of different colours red, white, green, yellow and black were left in a sunny place for 4 hours. Below is a graph showing the temperature in each cup at different times. A sample of the cup used for the investigation is shown below.



- (i) Based on the graph above, which colour is best suited for making a cap to be used on a sunny day? [  $\frac{1}{2}$  ]

- (ii) Three similar non-air conditioned buses, painted yellow, white and red respectively, were driven around town along the same route. Arrange the buses, based on the readings above, from the one with the lowest temperature inside to the one with the highest temperature inside. [  $\frac{1}{2}$  ]

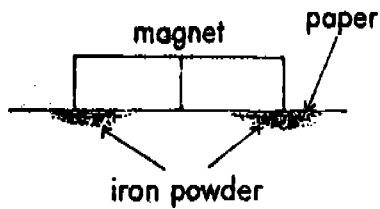
- (b) The makers of a cold drink machine wanted to use cups that would keep the drinks cold for as long as possible. Here are the results of their experiments.

Type of cup	Temperature of drink at the start (°C)	Temperature of drink after 10 minutes (°C)	Temperature of drink after 20 minutes (°C)
Thin polystyrene	10	16	20
Foam polystyrene	10	12	14
Paper	10	13	16
Polycarbonate	10	16	19

- (i) Which cup should they choose for their machine? [  $\frac{1}{2}$  ]

- (ii) Name one important variable that must be kept constant in order to ensure a fair test.

43. A group of pupils conducted an experiment as shown below.



Number of pieces of paper used	Amount of iron powder attracted
1	6 g
2	5.8 g
4	5 g
8	1 g
16	0.2 g
19	0.01 g

They increased the number of pieces of paper below the magnet and recorded the amount of iron powder that can be attracted in the table above.

(a) Explain why the iron powder can be attracted to the magnet. [1]

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(b) Based on their record, how much iron powder do you think will be attracted if the number of the pieces of paper is increased to 25? [ $\frac{1}{2}$ ]

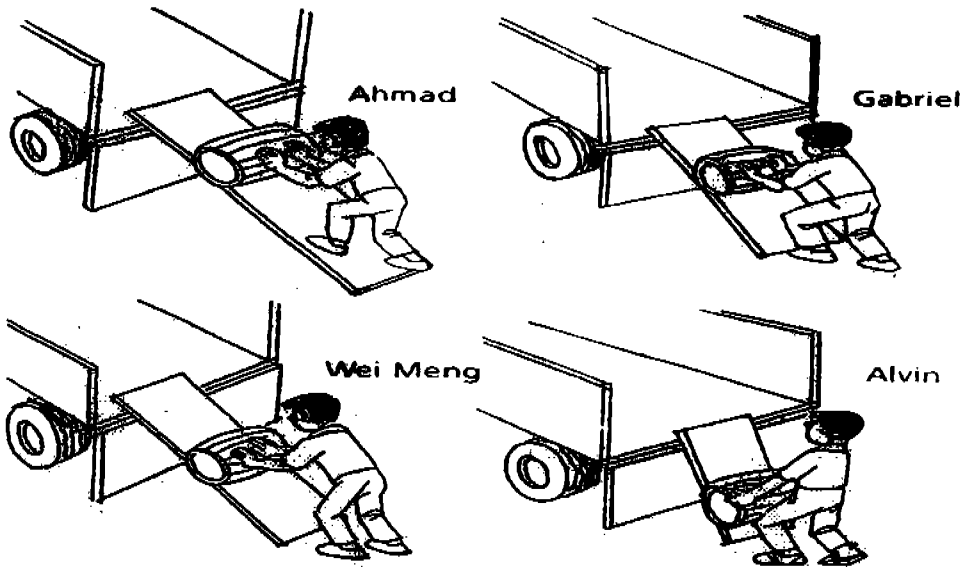
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(c) What will happen to the iron powder if a sheet of steel is placed between the magnet and a piece of paper? [ $\frac{1}{2}$ ]

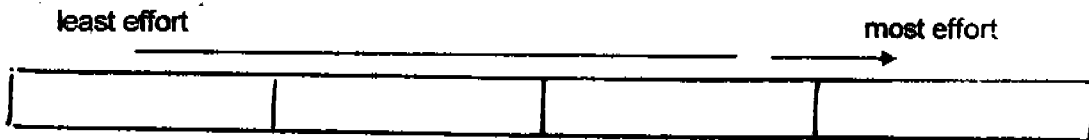
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44. Four men were using ramps to help them load a 10kg-barrel onto the truck.



(a) Arrange the 4 men in ascending order of the efforts needed to load the barrel onto the truck. [ $\frac{1}{2}$ ]



(b) Name the 2 forces that oppose the motion of the men as they load the barrel. [1]

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(c) Write down one difference between the 2 types of forces named in (b) [ $\frac{1}{2}$ ]

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45. (a) Ken heated a few paper clips over a strong flame for one minute. After that, he dropped them into a small cup of water.

(i) Describe one change Ken would observe in the water. [ $\frac{1}{2}$ ]

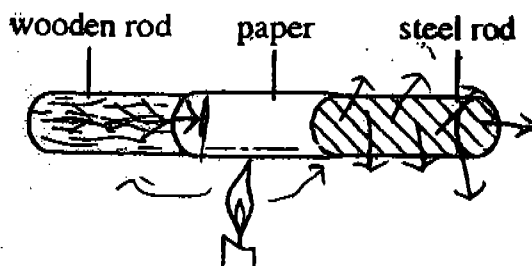
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(ii) Explain why the change in (i) took place. [1]

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(b) Some paper was wound tightly around a rod that is half steel and half wood as shown below. The rod was moved to and fro over a flame. After a while, some charring was observed at one end of the paper.



(i) Which end of the paper charred? [ $\frac{1}{2}$ ]

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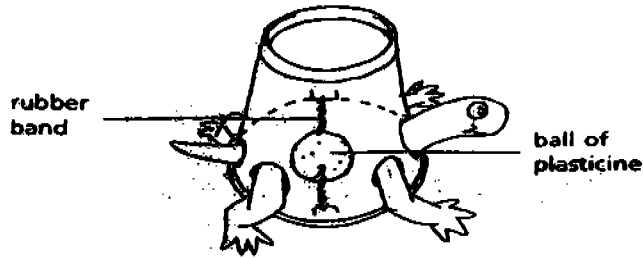
(ii) Explain the observation in (i). [1]

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- 46(a) Marcus made the toy tortoise using a polystyrene foam cup. He fixed a ball of plasticine to the rubber band inside the cup.



He placed the tortoise on the table and rolled it backwards. Then he released the tortoise and it was able to move on its own.

- (i) Explain why the toy tortoise was able to move on its own after it was released. [1]

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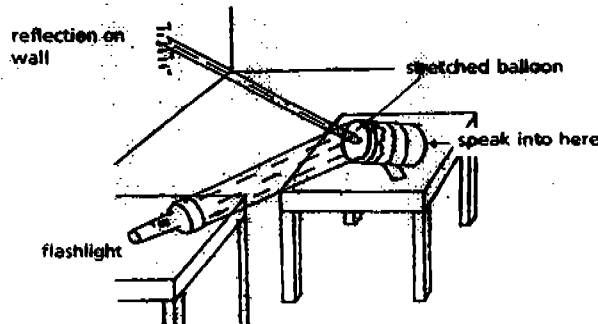
- (ii) What can Marcus do if he wants the toy tortoise to move a longer distance? [ $\frac{1}{2}$ ]

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- (b) Marcus did another experiment as shown below.



- (i) What property of light is demonstrated by his experiment? [ $\frac{1}{2}$ ]

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- (ii) Explain why the reflection on the wall moved when Marcus spoke loudly into the open end of the can. [1]

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MARIS STELLA HIGH SCHOOL (PRIMARY)  
 PRELIMINARY EXAMINATION 2005  
 SCIENCE  
 PRIMARY SIX

01. 4	11. 1	21. (1)
02. 4	12. 4	22. 3
03. 3	13. 1	23. 3
04. 1	14. (3)	24. 1
05. 4	15. 2	25. 1
06. (2)	16. (2)	26. (2)
07. 3	17. 3	27. (4)
08. 2	18. (4)	28. (1)
09. 3	19. (1)	29. 2
10. 1	20. 3	30. (2)

31) a) tilapia

pond-skaters

tadpoles

water plants

b) It decreases. The duckweeds would cover the whole surface and block the sunlight and the tape grass cannot photosynthesize. It cannot make food and will eventually die.

32) a) Where the tank is placed.

Time of the day when the readings are taken.

b) The longer the gold fish was in the tank, the faster the average number of times its gill covers open and close.

c) The water became dirty as he did not change the water and there are no plants so there would not have enough oxygen.

d) brathing tubes skin air bubbles gills

33) a) Moisture

b) Dark and moist places

c) rotting log

34) a) *Start at the mouth label at mouth opening.*

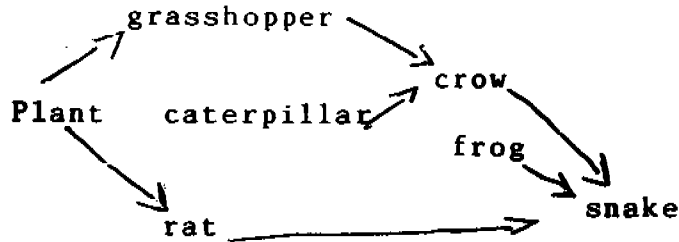
b) Digestion cannot be completed and the partially digested food is passed out of the body and not absorbed.

c) Circulatory system.



- 35) a) A. It has light, carbon dioxide and chlorophyll.  
 b) Drop the iodine on the cream, if it remains yellowish brown, starch is not present.

36) a)



b) They would decrease as there is no one feeding on the grasshopper and the caterpillar so they can reproduce and eat more plants.

37) a) Animal C

b) i) All insects have six legs but animal C has eight legs.

ii) All insects have three body parts but animal C has two

c) Oxygen, moisture and warmth

38) a) i) A

ii) C

b) Dispersal

germination

fertilization

c) B, D, E, C

39) a) i) It came from the air outside the freezer, it touched a cool surface which is the packet of her frozen chips to form water droplets and condensed.

ii)

b) i) Reduce

ii) Reduce, reuse

iii) Reduce

iv) Reduce, reuse

40) a) B and C

b) B

c) Chemical energy --- electrical energy --- light and sound energy

41) a) The distance moved by the effort is more than the distance moved by the load. The distance moved by the load is almost half of the distance moved by the effort.

b) The amount of effort needed to move the load is half of the load. It changes the direction of the applied force.

- 42) a) i) A white cap  
ii) white bus, yellow bus and the red bus.  
b) i) They should use the foam <sup>Polystyrene</sup> polystyrene cup.  
ii) The amount of water
- 43) a) Magnetism can pass through non magnetic materials.  
b) No iron powder will be attracted.  
c) It would not be attracted.
- 44) a) Ahmand Wei Meng Gabriel Alvin  
b) Frictional force and gravitational force  
c) Gravity acts from a distance but friction acts between two surfaces in contact.
- 45) a) The water becomes hotter.  
ii) The water gains heat from the paper clips and the paper clips lose heat to the water.  
b) i) The wooden rod  
ii) Wood is a poor conductor of heat and is unable to contact heat away quickly.
- 46) a) i) It has kinetic energy from the twisted rubber band.  
ii) He can roll it back more.  
b) Light can be reflected *and it travelled in a straight line.*  
ii) The balloon vibrated due to the vibrations in the sound waves from Marcus's voice. Thus the reflection moves.