

SAL

**MAHA BODHI SCHOOL**  
**2005 PRELIMINARY EXAMINATION**  
**SCIENCE**  
**PRIMARY 6 EM1 / 2**

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

Date: 25 August 2005

Class: Primary 6 ( )

Course: EM 1 / 2

**BOOKLET A**

**30 Questions**

**60 marks**

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

**Instructions to Candidates**

**Do not open this booklet until you are told to do so.**

**Follow all instructions carefully.**

**Check all the pages carefully to make sure that all the questions are in order.**

**Answer all the questions.**

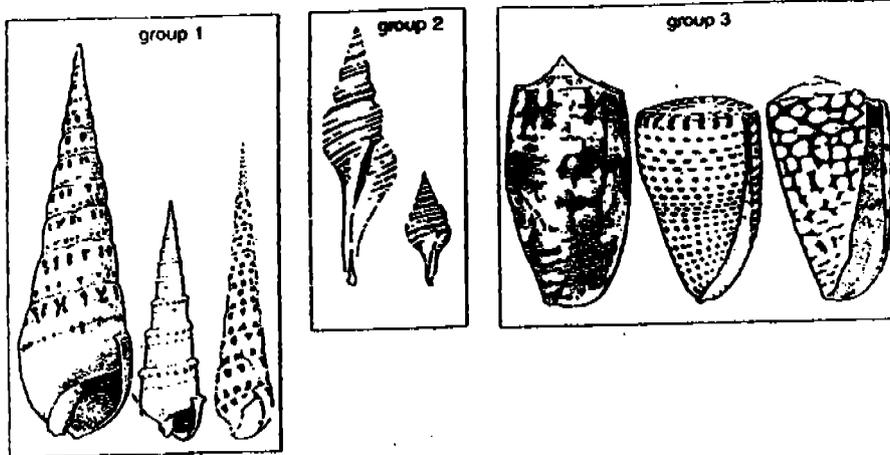
**If a question is difficult, go on to the next one. Do not waste time.**

**This booklet consists of 16 pages.**

**PART I (60 marks)**

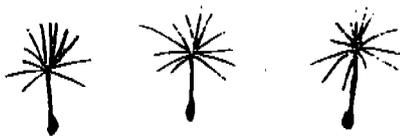
For each question from 1 to 30, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet (OAS).

1. Janet collected some shells at the beach. She sorted the shells into three groups.



Which characteristic did Janet use to sort the shells into these groups?

- (1) Size
  - (2) Shape
  - (3) Weight
  - (4) Pattern
2. The diagram below shows some seeds from a plant.

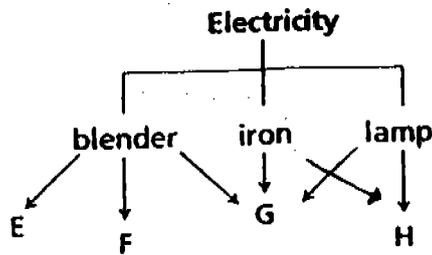


Dandelion seeds

Study the drawing carefully.  
How are the Dandelion seeds scattered?

- (1) By wind
- (2) By water
- (3) By animals
- (4) By splitting

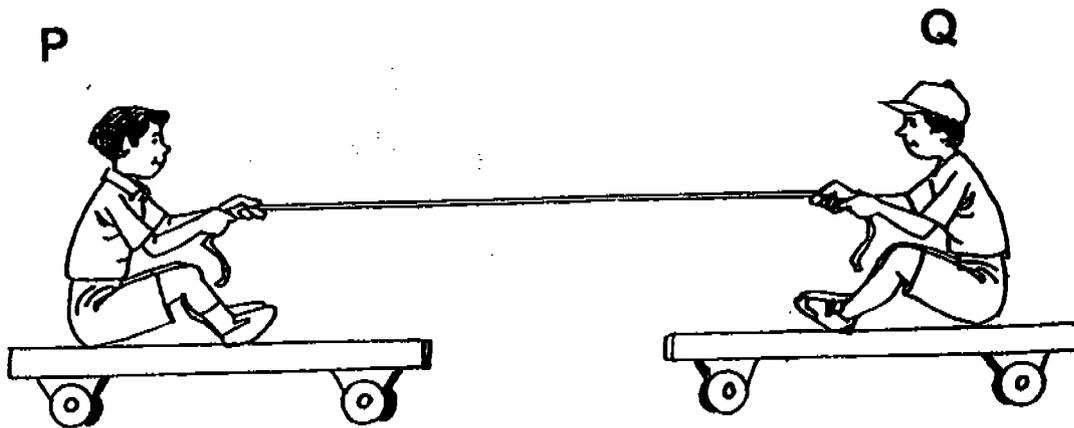
3. The diagram below shows the conversion of electricity to other forms of energy by some electrical appliances when they are turned on.



Which one of the following lists identifies the type of energy as represented by E, F, G and H correctly?

	E	F	G	H
(1)	Heat	Kinetic	Light	Sound
(2)	Sound	Kinetic	Light	Heat
(3)	Sound	Heat	Kinetic	Light
(4)	Kinetic	Sound	Heat	Light

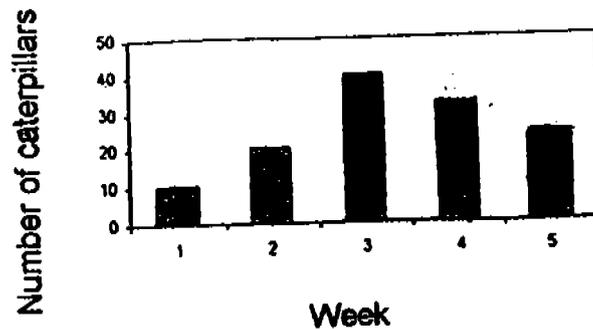
4. Two boys, P and Q, of equal weight are sitting on two similar trolleys on level ground. They are holding a rope as shown in the diagram below.



Which one of the following will happen when P pulls the rope?

- (1) P and Q will move towards each other.
- (2) Q will move towards P who will remain still.
- (3) P will move towards Q who will remain still.
- (4) Q will move forward while P will move backward.

5. The bar graph below shows the changes in the population of caterpillars in a field over five weeks.



Study the graph carefully. Which of the following statements are possibly true?

- A: The populations of birds decreased after the 3<sup>rd</sup> week.
- B: More crops were grown in the field from the 4<sup>th</sup> week onwards.
- C: The population of caterpillars increased from the 1<sup>st</sup> to 3<sup>rd</sup> week.
- D: There was an outbreak of bird flu during the 1<sup>st</sup> to 3<sup>rd</sup> week.
- E: The farmers stopped using pesticides on their crops from the 4<sup>th</sup> week onwards.

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

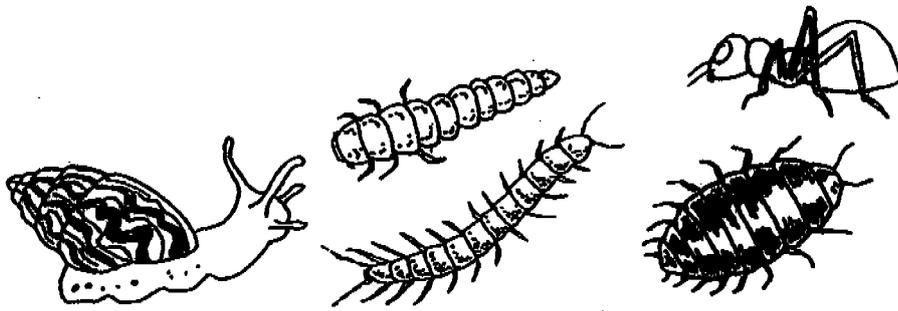
6. Why are woodlice and earthworms commonly found in the soil under flower pots?

- (1) They could feed on other animals.
- (2) The ground is damp under the flower pots.
- (3) There are no predators to feed on them.
- (4) More carbon dioxide can be found under the flower pots.

7. Only a small amount of energy is passed along a food chain because

- (1) not all the food is eaten up
- (2) the energy is used up while hunting for food
- (3) the energy is destroyed if the food is not eaten quickly
- (4) the energy is lost as heat and used for each animal's activities

8. A group of pupils went on a field trip and returned with the following specimens as shown below.

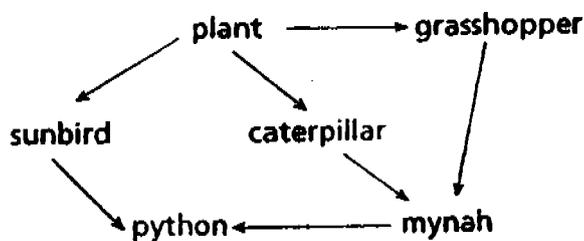


Which of the following factors attracted these animals to the same habitat?

- A: Presence of food
- B: Availability of shelter
- C: Similar feeding habits
- D: Amount of air

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

9. Study the food web carefully.



Which of the following food chains can be obtained from the above food web?

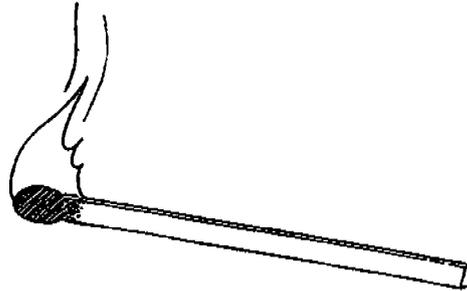
- A: plant → grasshopper → mynah → python
- B: plant → caterpillar → mynah → python
- C: plant → caterpillar → sunbird → python

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

10. The bird below has a long and thin beak. What does it feed on?

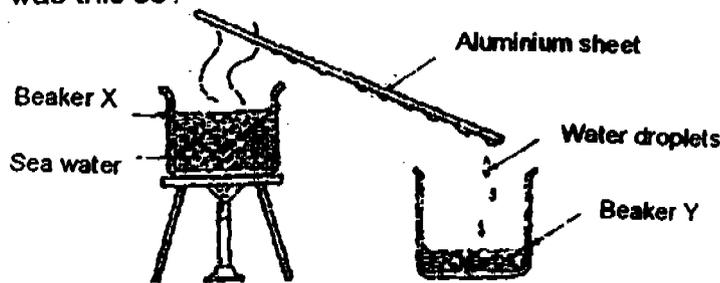


- (1) Mice
  - (2) Worms
  - (3) Nectar
  - (4) Insects
11. As the match burns, the wood is reacting with a gas in the air. Which gas is it?



- (1) Oxygen
  - (2) Nitrogen
  - (3) Water vapour
  - (4) Carbon dioxide
12. Which of the following will fill a  $300\text{ cm}^3$  container completely?
- (1)  $100\text{ cm}^3$  of sand
  - (2)  $100\text{ cm}^3$  of marbles
  - (3)  $100\text{ cm}^3$  of nitrogen
  - (4)  $100\text{ cm}^3$  of orange juice
13. Which of the following is/are part of the water cycle?
- A: Melting of snow  
B: Evaporation of water from rivers  
C: Giving out of water vapour by plants
- (1) A only
  - (2) B only
  - (3) B and C only
  - (4) A and C only

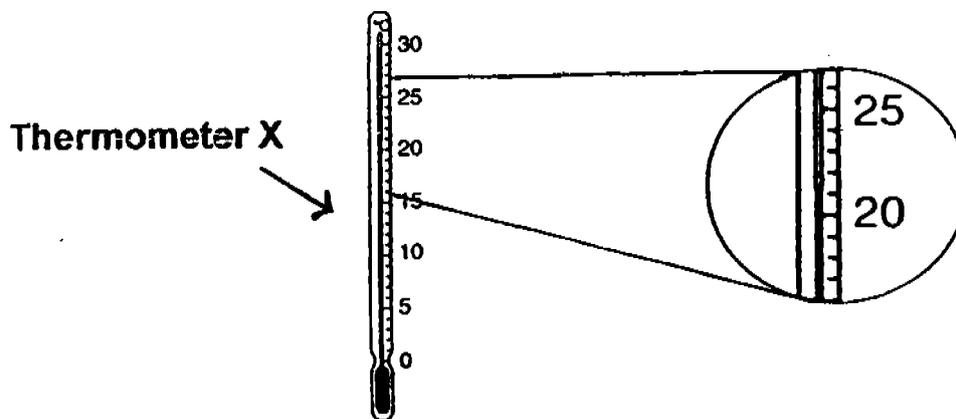
14. Some sea water was heated in a beaker. After some time, it was observed that the number of water droplets formed on the aluminium sheet became less and less. Why was this so?



- A: The aluminum sheet had become hotter.  
 B: The rate of condensation had decreased.  
 C: Beaker X had become hotter.

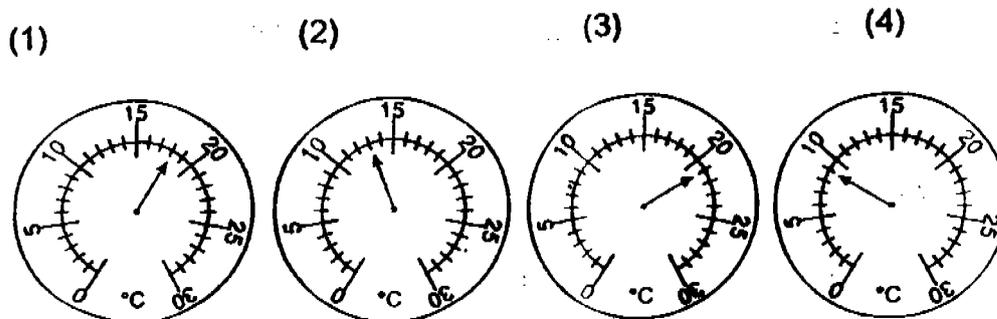
- (1) A and C only  
 (2) A and B only  
 (3) B and C only  
 (4) A, B and C

15. Yongmin measured the temperature of a room using thermometer X.

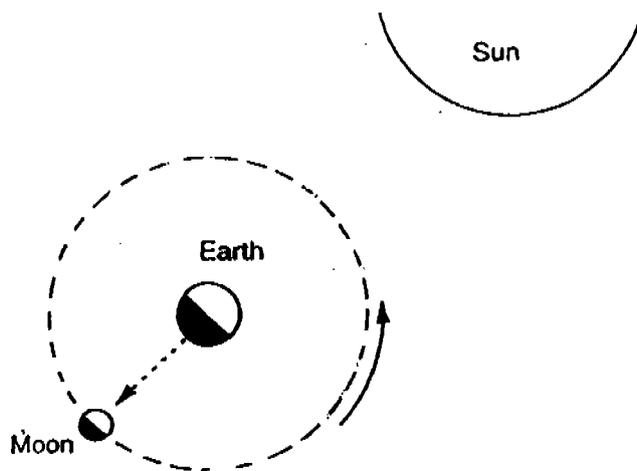


Lixin measured the temperature of the same room using a different thermometer like the one below.

Which diagram shows the same temperature as on Thermometer X?



16. The diagram below shows the position of the Sun, Earth and Moon.



How would the Moon look like from the Earth?



(1)



(2)



(3)



(4)

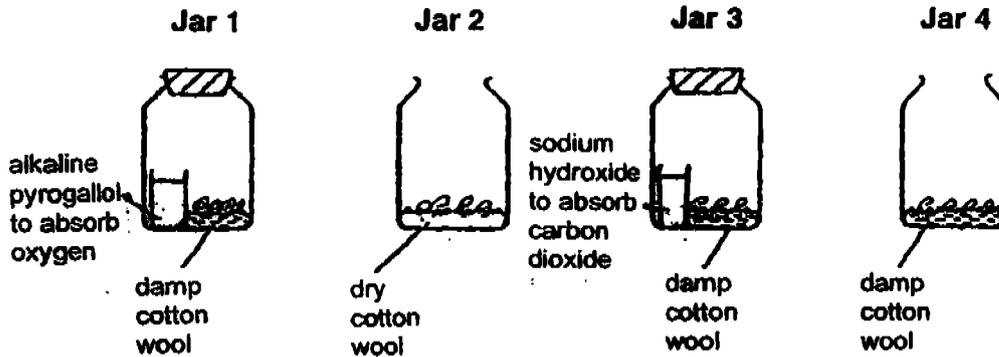
17. Wei Xin conducted a test to find out how surface area affects the rate of evaporation of water. She placed 6 different containers in the basketball court. The conditions for each container are shown below.

Container	A	B	C	D	E	F
Exposed surface area of water in container (cm <sup>2</sup> )	25	40	72	40	72	25
Length of time of experiment (hours)	7	6	6	8	6	5
Volume of water (cm <sup>3</sup> )	80	100	80	200	100	200

To make it a fair test, which 2 set-ups should she use?

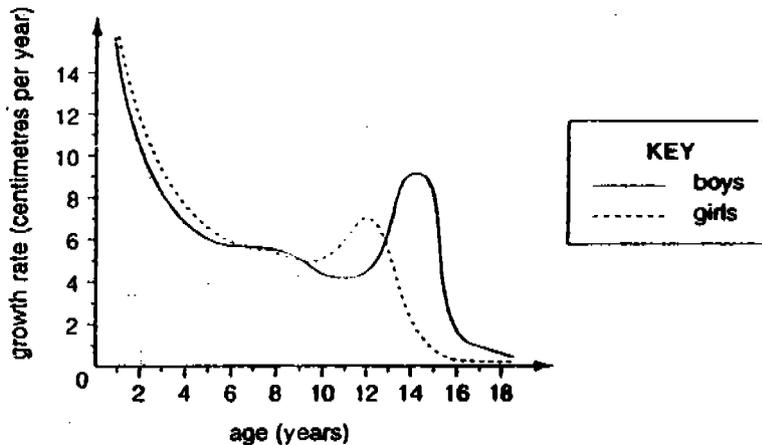
- (1) A and F  
 (2) B and D  
 (3) B and E  
 (4) C and E

18. Four jars containing seeds were set up at room temperature as shown in the diagram below.



In which 2 jars is germination most likely to occur?

- (1) Jars 1 and 2  
 (2) Jars 1 and 4  
 (3) Jars 2 and 3  
 (4) Jars 3 and 4
19. The graph below shows the growth rate for boys and girls.



- (A) Boys achieve maximum height at the age of 14 years.  
 (B) Girls and boys reach the same height at the age of 9 and 13 years.  
 (C) At puberty, the growth rate of girls is maximum at the age of 12.

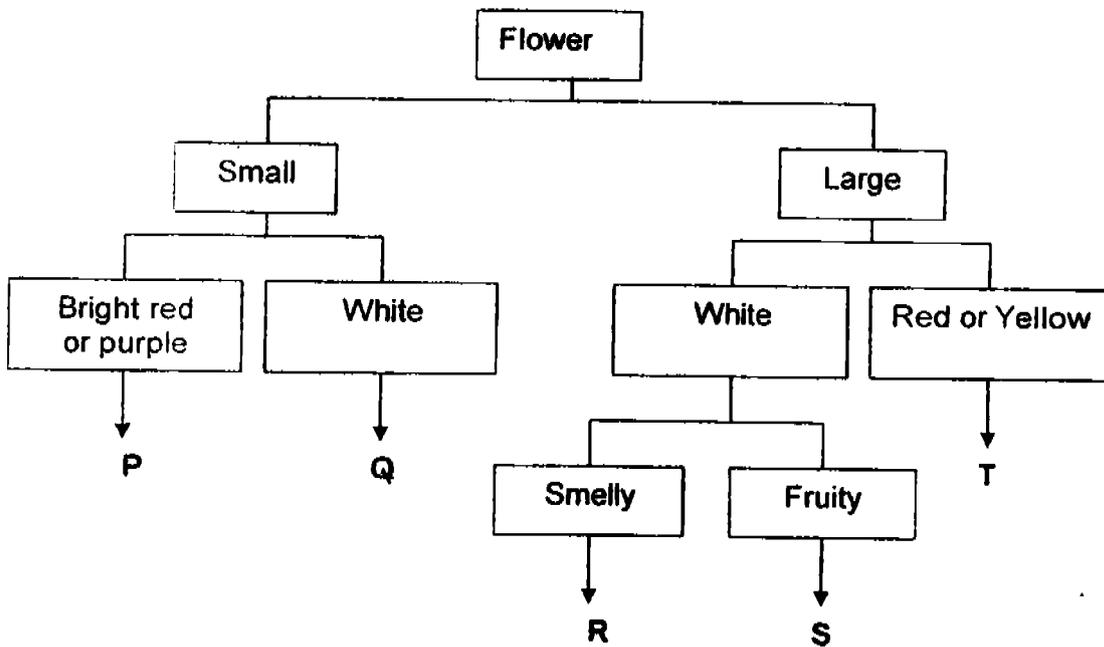
Which of the following statement(s) is /are supported by the graph?

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

20. The table shows the characteristics of some flowers that attract animals.

Animal	Characteristics of flowers		
	Size	Colour	Smell/Odour
Bee	Small	Bright red or purple	-
Bat	Large	White	Fruity
Bird	Large	Red or Yellow	-
Beetle	Large	White	Smelly
Butterfly	Small	White	-

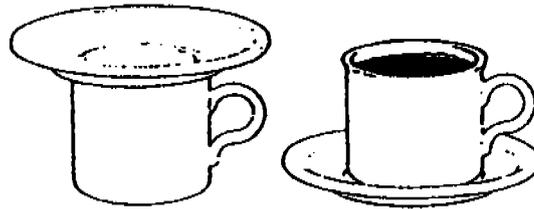
The chart below classifies 5 flowers P, Q, R, S and T.



Which animals would be attracted to Flower Q and Flower T?

	Flower Q	Flower T
(1)	Bee	Beetle
(2)	Butterfly	Bird
(3)	Bat	Bee
(4)	Butterfly	Bat

21.



Pei Ling poured 2 cups of coffee. She covered one cup and left the other uncovered. She recorded the change in temperature of each cup for 10 minutes.

Time (min)	Temperature (°C)	
	Covered Cup	Uncovered Cup
0	90	90
2	82	75
4	74	62
6	67	51
8	60	41
10	54	38

How **much longer** does Pei Ling have to wait for the coffee in the covered cup to cool down to 38°C?

- (1) 2 minutes
- (2) 4 minutes
- (3) 6 minutes
- (4) 8 minutes

22.



Dragonfly



Woodlouse



Spider



Millipede



Centipede

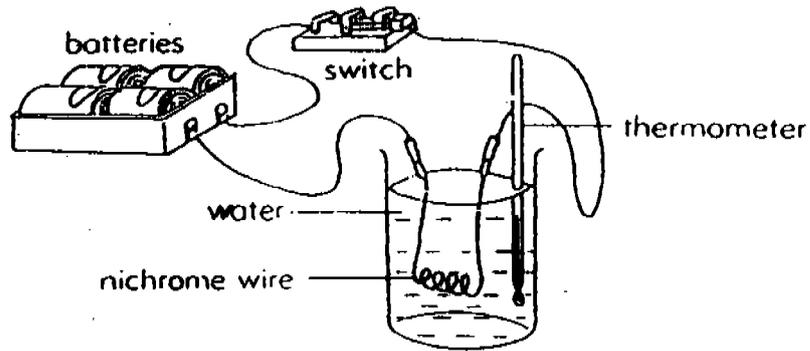


Grasshopper

Classify the animals above into **2 groups** such that there are **3 animals in each group**.

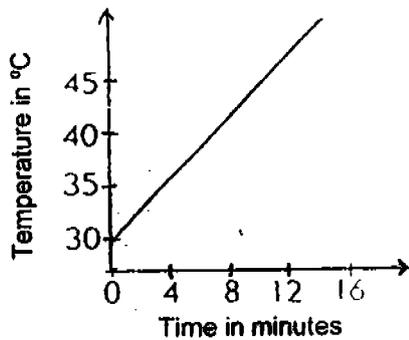
	Group X	Group Y
(1)	Can fly	Cannot fly
(2)	Plant eaters	Animal eaters
(3)	Have feelers	Do not have feelers
(4)	With segmented body	With non-segmented body

23. Jeff and Yu Tian set up the circuit as shown below. The switch was closed for 8 minutes and then left open.

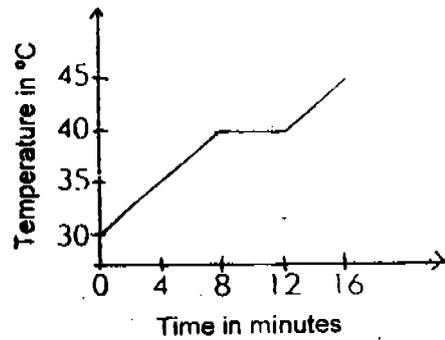


Which one of the following graphs shows the change in temperature of the water with time?

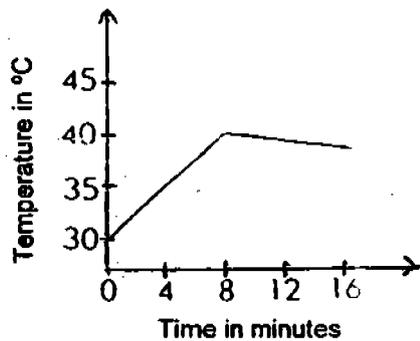
(1)



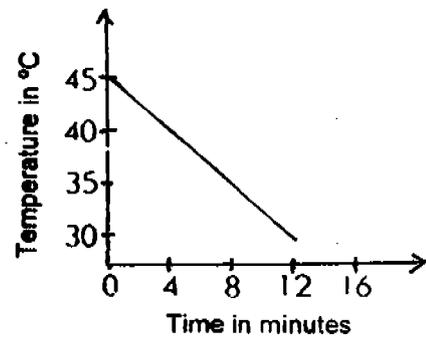
(2)



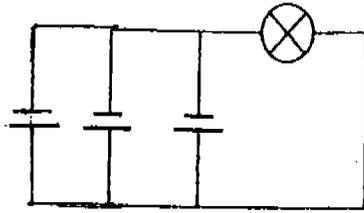
(3)



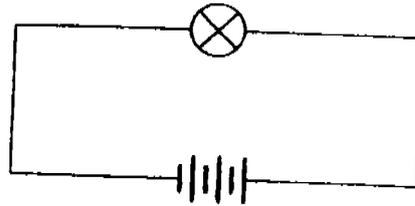
(4)



24. Liqi used similar batteries to set up the circuits below.



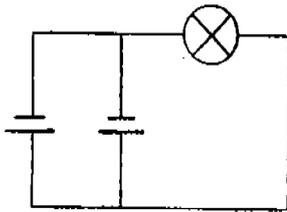
This 1.5 volt bulb glowed for 3 hours.



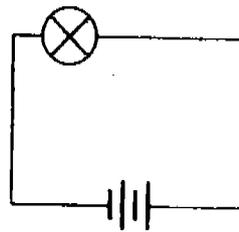
This 4.5 volt bulb glowed for 1 hour.

Which one of the circuits below would make a 3 volt bulb glow for 2 hours?

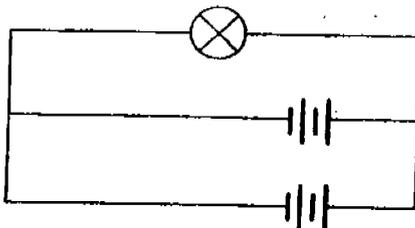
(1)



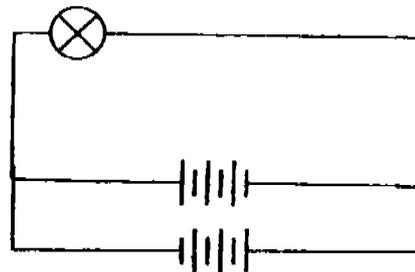
(2)



(3)



(4)



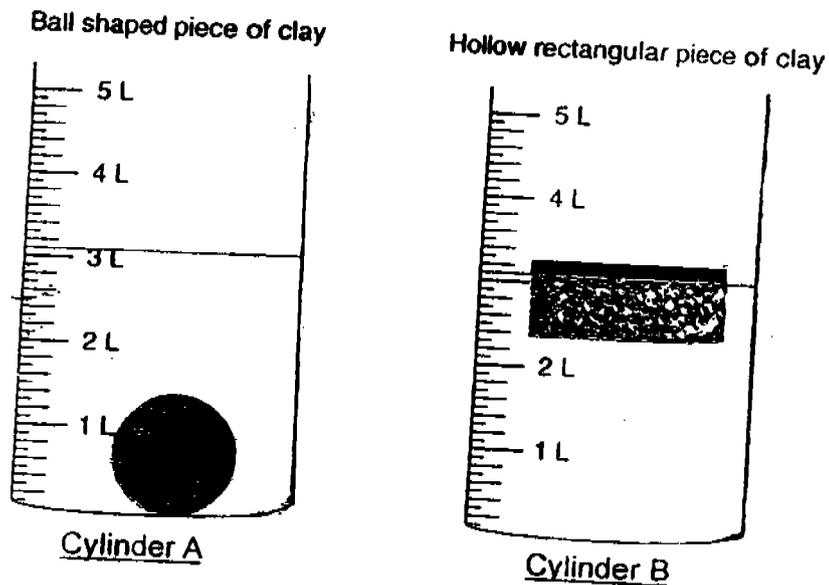
27. Mrs Tan explained to her class that

- Mass
- Density =  $\frac{\text{Mass}}{\text{Volume}}$
  - An object that is more dense than water sinks in it
  - An object that is less dense than water floats on it

Jun Yang predicted that a clay object would sink in water.

Mrs Tan carried out the following experiment to test his prediction.

She used 2 measuring cylinders, each containing 2.5 litres of water. She carefully lowered a ball-shaped piece of clay into cylinder A and a hollow rectangular piece of clay into cylinder B. The 2 pieces of clay have the same mass.



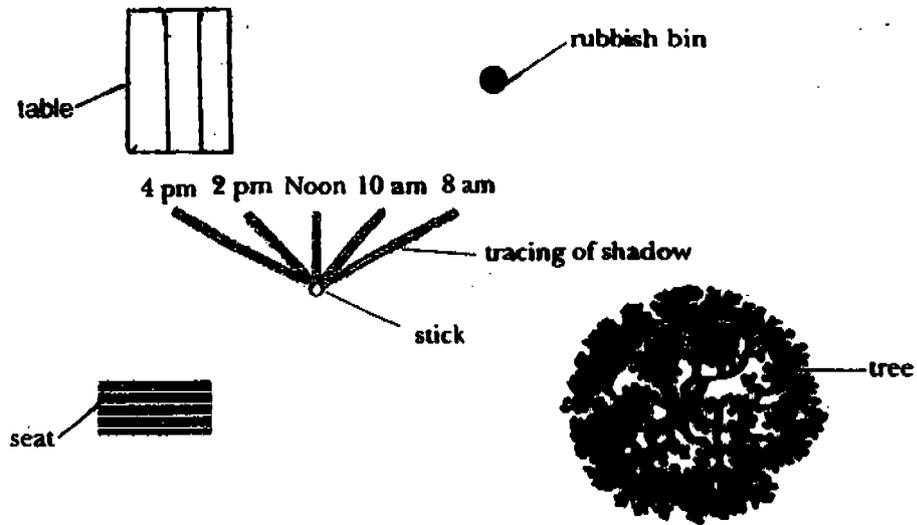
Jun Yang explained that the hollow rectangular piece of clay floated on water because of the following reasons:

- (A) The density of the object decreased. ✓
- (B) The mass of the clay decreased. ✓
- (C) The volume of the clay increased. ✓

Which explanation(s) is/are correct?

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

25. Rachel placed a stick upright in the ground and traced the shadow made by the stick every 2 hours from 8 am to 4 pm. The diagram below shows the stick and the tracings of the shadow as seen from above.



Which object is north-east from the stick?

- (1) The tree
- (2) The seat
- (3) The table
- (4) The rubbish bin

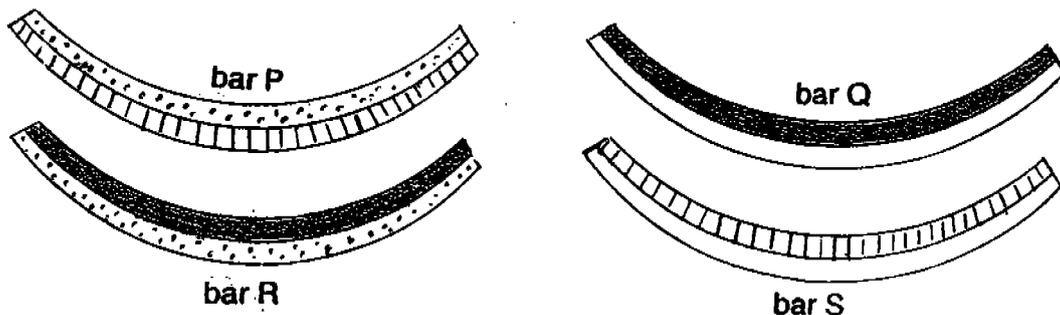
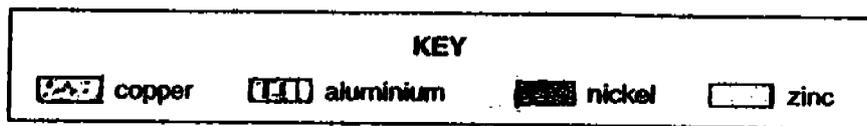
26. Four objects of different weights were attached to a spring, one at a time. The original length of the spring is 5 cm.

Object	Length of Spring (cm)
A	8
A + B	12
A + B + C	17
A + B + C + D	21

Which object has the greatest weight?

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

28. Dennis heated 4 bars, P, Q, R and S, made of different metals, for 10 minutes. Each bar is made of 2 metal strips of the same size joined together. His results are shown below.

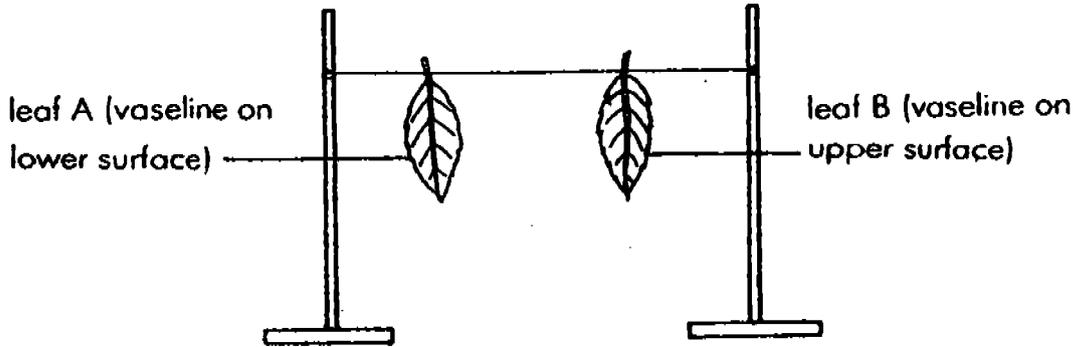


He concluded that different metals expanded at different rates when heated. Arrange the metals according to the rate of expansion, starting with the one that expands the most.

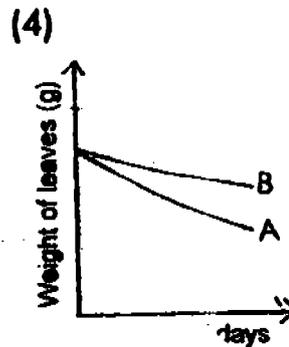
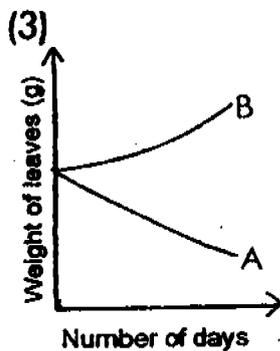
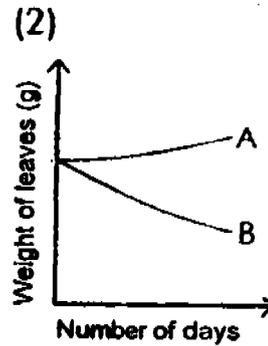
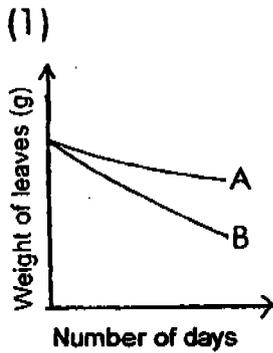
- (1) Copper, nickel, aluminium and zinc
  - (2) Aluminium, nickel, zinc and copper
  - (3) Zinc, aluminium, copper and nickel
  - (4) Zinc, copper, nickel and aluminium
29. Daphne left a glass of ice cubes on the table for some time. She noticed some water droplets on the outer surface of the glass. Which one of the following statements explains correctly how the water droplets were formed?
- (1) The <sup>glass</sup> beaker absorbed water from the surrounding air.
  - (2) The surrounding air condensed on the surface of the glass.
  - (3) Water from the melted ice condensed on the cool surface of the glass.
  - (4) Water vapour in the air condensed on the cool outer surface of the glass.

30

Nathan and Wei Xuan smeared different surfaces of two identical leaves with vaseline and hung them in an airy place. Vaseline gives a waterproof covering to the surface. They weighed the leaves every day.



Which one of the following graphs shows the change in weight of the 2 leaves?



END OF PART I

**MAHA BODHI SCHOOL**  
**2005 PRELIMINARY EXAMINATION**  
**SCIENCE**  
**PRIMARY 6 EM1 / 2**

Name: \_\_\_\_\_ (     )

Date: 25 August 2005

Class: Primary 6 (     )

Course: EM 1 / 2

**BOOKLET B**

**16 Questions**

**40 marks**

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

**Instructions to Candidates**

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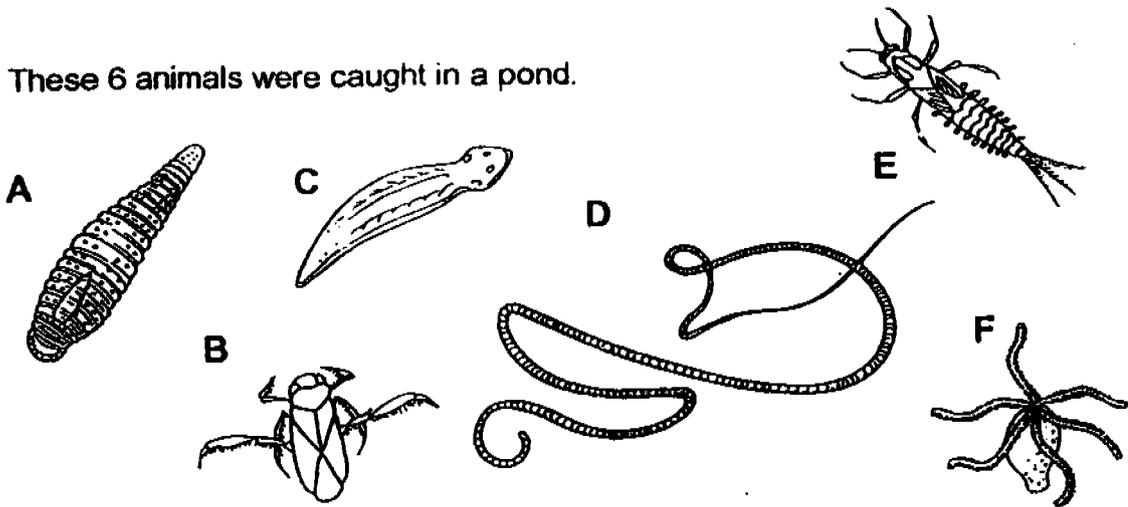
**This booklet consists of 16 pages.**

	Max. Marks	Actual Marks
Booklet A	60	
Booklet B	40	
Total	100	
Parent's Signature		

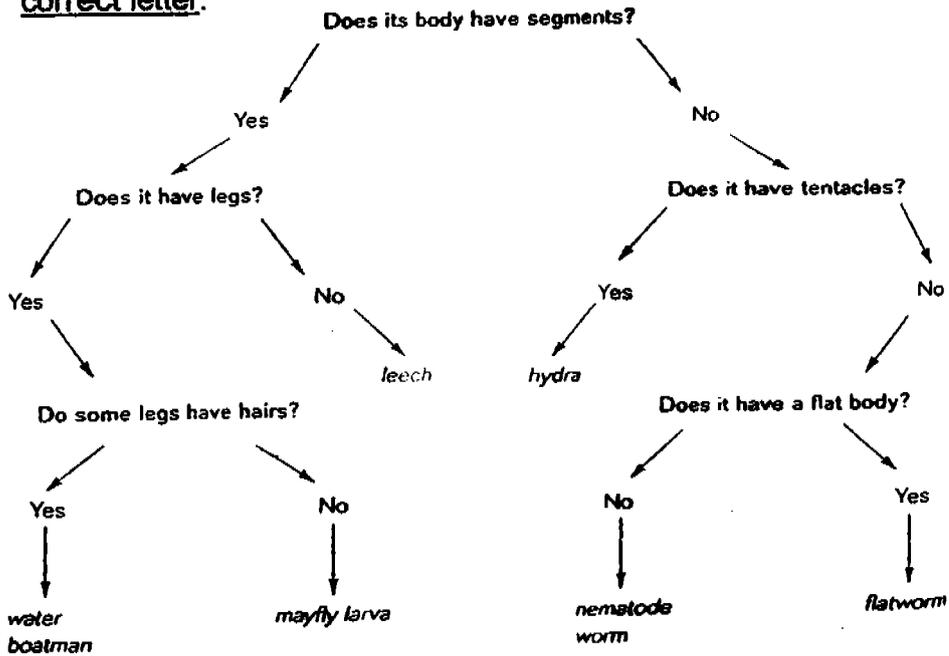
**PART II (40 marks)**

Write your answers to questions 31 to 46 in this booklet.

31. These 6 animals were caught in a pond.



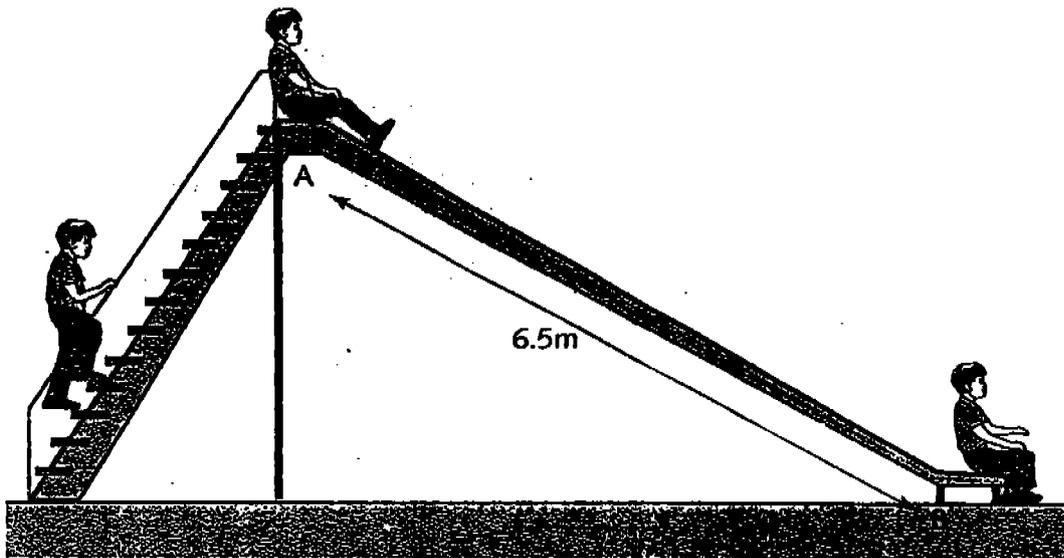
Use this key to identify the animals and fill in the blanks below with the correct letter.



- (i) Leech \_\_\_\_\_
- (ii) Flatworm \_\_\_\_\_
- (iii) Hydra \_\_\_\_\_
- (iv) Water Boatman \_\_\_\_\_

[2]

32. Joe climbs to the top of the ladder and then slides down from A to B.



(a) Which form of energy has he gained as he climbs up the ladder?

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[1/2]

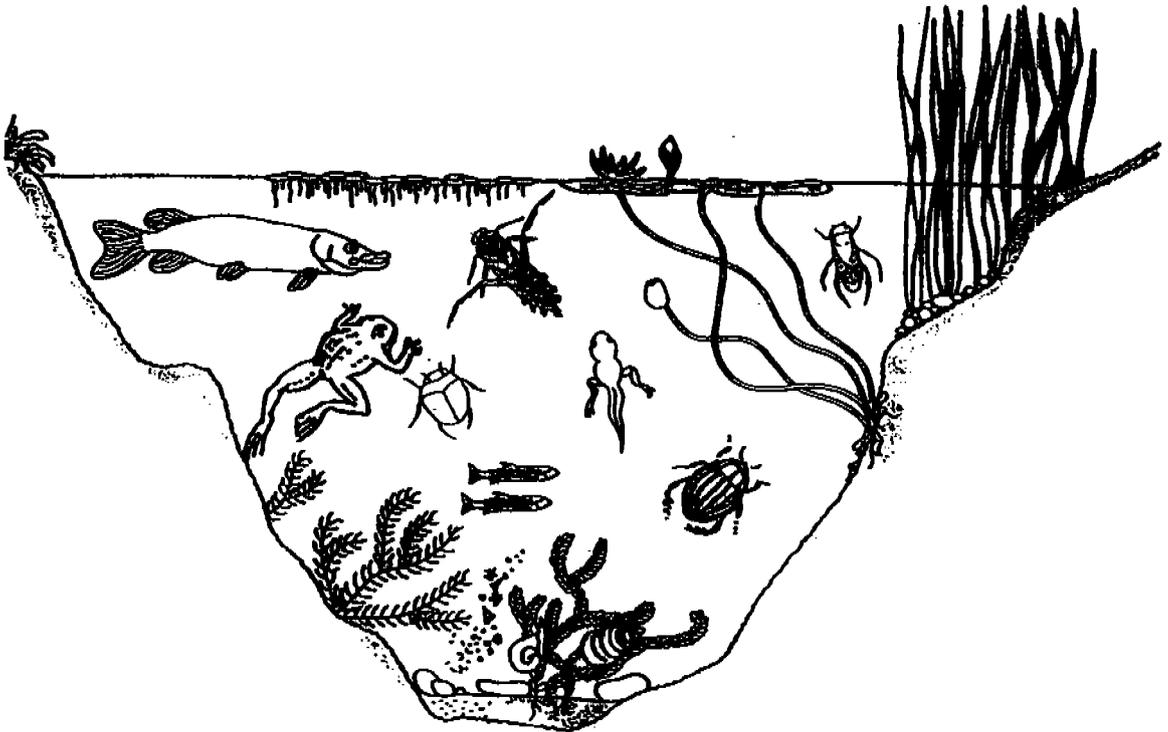
(b) Describe the change of energy from A to B as he accelerates down the slippery slide.

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[1]

33.



Jack studied a pond community and came out with the following food chains.

- Tadpoles feed on duckweed.
- Snakeheads feed on water beetles.
- Tadpoles are eaten by water beetles.

(a) Study this information and write it as a food chain.

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[½]

(b) Name the producer in this food chain: \_\_\_\_\_

(ii) Name the organism that is both a predator and prey in this food chain:

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[1]

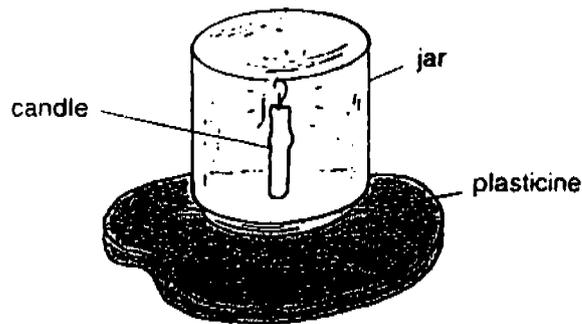
(c) Fishing reduces the snakehead population greatly. Explain the effect that this activity would have on the number of tadpoles.

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34. In set-up A below, a jar was put over a burning candle so that no air could get into it. The candle went out after 5 seconds of burning.



Set-up A

- (a) As John put more burning candles in the jar, he found that the length of burning time was different from that in set-up A.

What is the pattern between the number of burning candles and the length of burning time?

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[1]

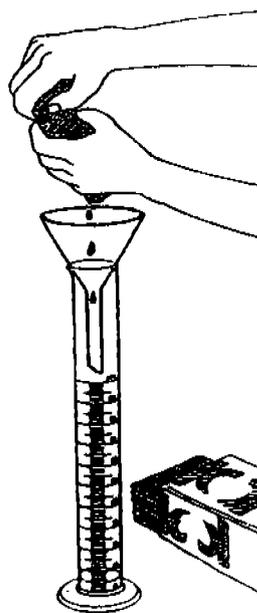
- (b) Explain your answer in (a).

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35. Daniel and Cathy carried out an experiment.

They tested six different types of paper by dipping each one into water. Then they squeezed as much water from each paper as possible into a measuring cylinder.



(a) What was the aim of the experiment?

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(b) What should they do to make sure that their experiment was a fair test?  
Tick the correct box(es). [1]

- Use pieces of paper of exactly the same size.
- Test each type of paper twice.
- Let each paper drip for the same length of time before squeezing it.
- Soak each paper for the same length of time.
- Squeeze each paper equally hard.

36. The 2 figures below show a species of 'ant plant' (Figure 1) and one of its modified hollow sac-like leaves which has been cut to show the activities taking place inside the sac (Figure 2).

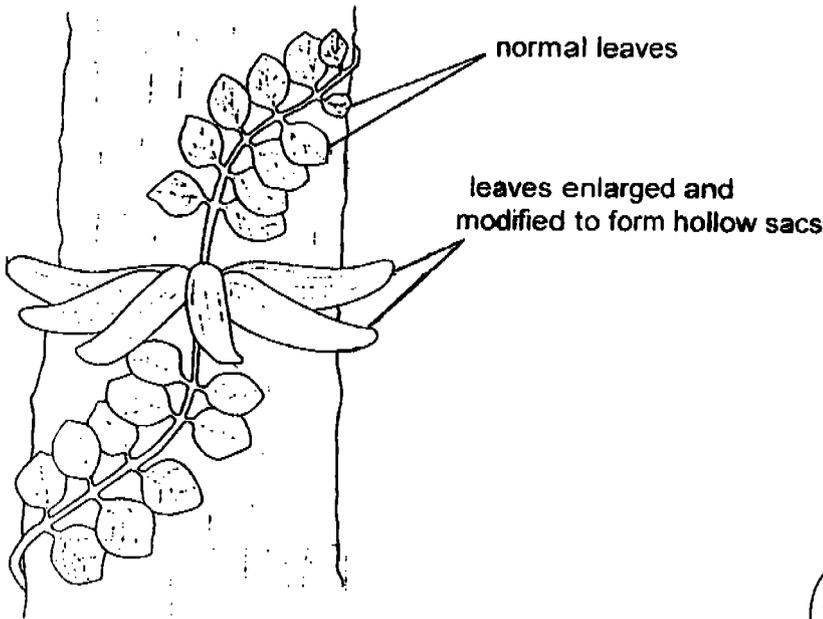


Figure 1: 'Ant plant' with 2 types of leaves

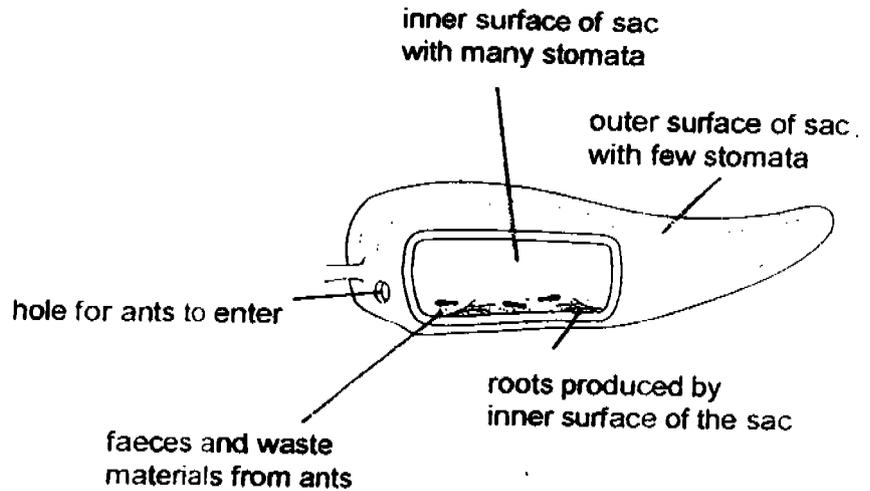


Figure 2: One sac being cut open to show the inside

- (a) What are the structural adaptations of the modified leaves as shown in Fig. 2?

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- (b) Explain how each of these adaptations helps the 'ant' plant to survive in its habitat.

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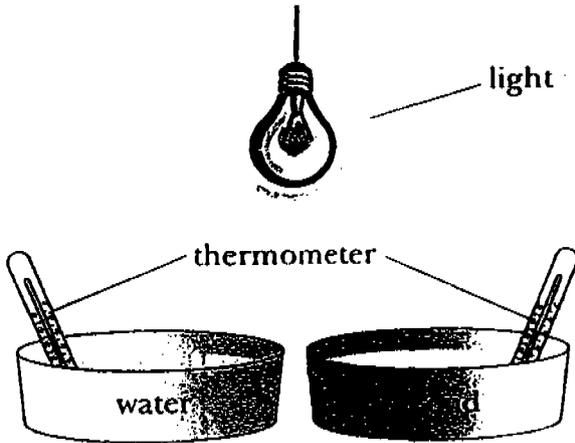


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37. Xinyi and Limei wanted to find out how quickly water and sand heat up and cool down. They used a light bulb as a source of heat. The light bulb was on for six minutes and then turned off.



The results are in the table below.

Time (minutes)	Temperature (°C)	
	Water	Sand
0	20	20
2	22	24
4	24	28
6	26	32
8	25	29
10	24	26

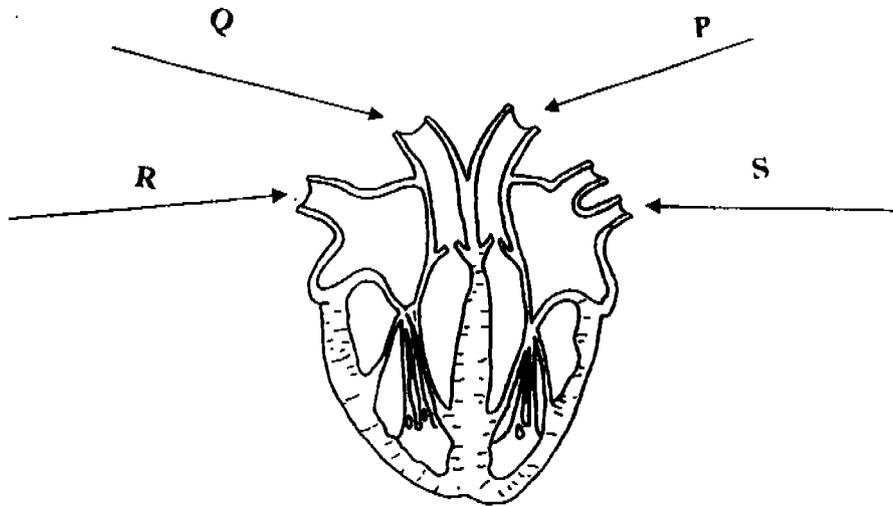
- (a) What was the rise in the temperature of the sand after 6 minutes?

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

- (b) What could Xinyi and Limei conclude from this experiment?

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

38. The diagram below shows a human heart.



(a) Complete the table to show whether the blood in vessels P, Q, R and S is oxygenated or de-oxygenated. [1]

	Type of blood
P	
Q	
R	
S	

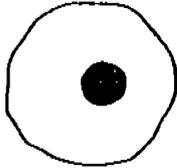
(b) What is the function of the heart?

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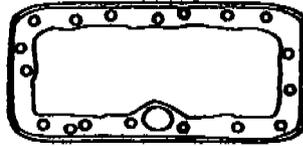


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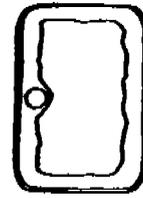
39.



A



B



C

A, B and C represent cells.

- (a) State **3 similarities** between cell A and cell B. **Do not** compare shape and size.

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- (b) State **1 difference** between cell B and cell C. **Do not** compare shape and size.

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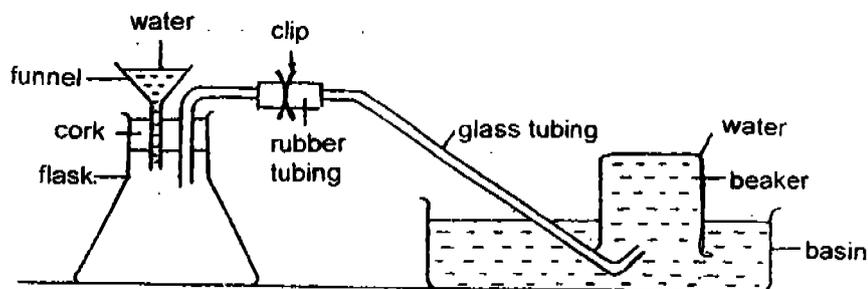
- (c) Which of the cell(s) above is/are plant cell(s)? Give a reason for your answer.

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40. Madeline set up the experiment below.



- (a) She observed that when the clip was closed, water from the funnel could not enter the flask.  
What is the reason for this?

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- (b) What would happen in the basin when Madeline opens the clip?  
State two observations.

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

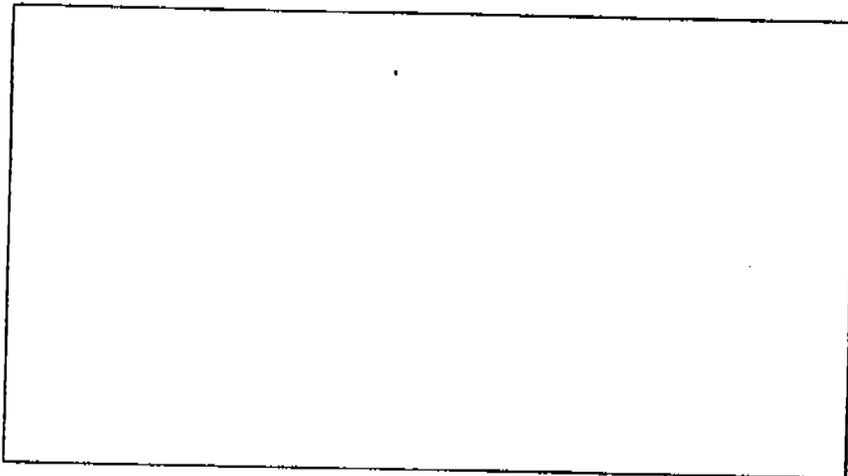
(ii) \_\_\_\_\_

41. Benn compares the lighting in his house with the lighting on his Christmas tree. He observes that when one bulb fuses on his Christmas tree, all the other bulbs do not light up. However, when one bulb fuses in the lighting in his house, all the other bulbs still light up.

Draw a circuit diagram in each of the space below that best illustrates the electrical connection for the Christmas tree and the lighting in Benn's house.

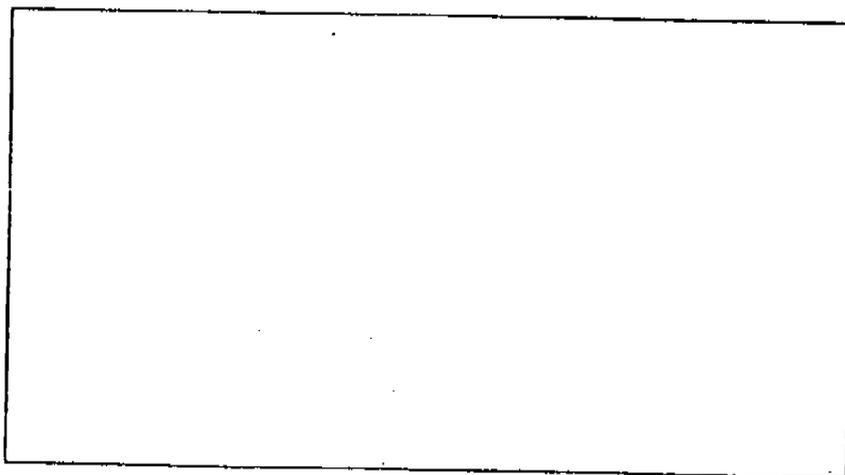
Use standard symbols for the circuit diagrams.

- (a) Draw the circuit diagram for the lighting in the Christmas tree. Use only 1 battery, 2 bulbs, 1 switch and some wires.



[1½]

- (b) Draw the circuit diagram for the lighting in the house. Use only 1 battery, 2 bulbs, 2 switches and some wires.



[1½]

42. Jaslynn designed a wheel and axle system for lifting a load. She used the same axle but experimented with wheels of different diameters to lift the same load. She recorded her observations in the table below.

Wheel	Effort required to lift the load (kg)
P	5.8
Q	5.0
R	6.2
S	7.5

- (a) What do you think Jaslynn was trying to find out?

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- (b) Was she making a fair test? Explain your answer.

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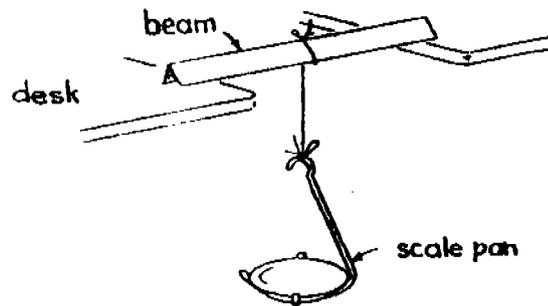
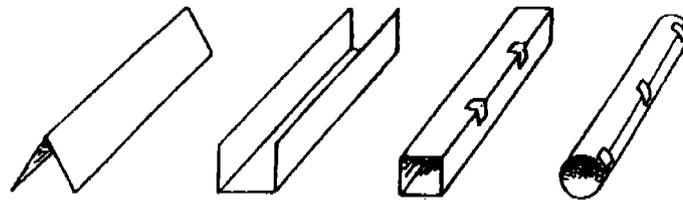
[1]

- (c) Arrange the wheels according to their diameters, starting with the largest wheel.

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[1]

43. Julian used a similar cardboard material to fold a variety of beams of the same mass.  
He set up an experiment to find out which beam is the strongest. He suspended each beam between 2 desks to form a bridge and added weights to the same scale pan until the beam collapsed.



- (a) State **2 important** variables that he must keep the same for the experiment to be a fair test.

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

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

- (b) What must he measure to determine which beam is the strongest?

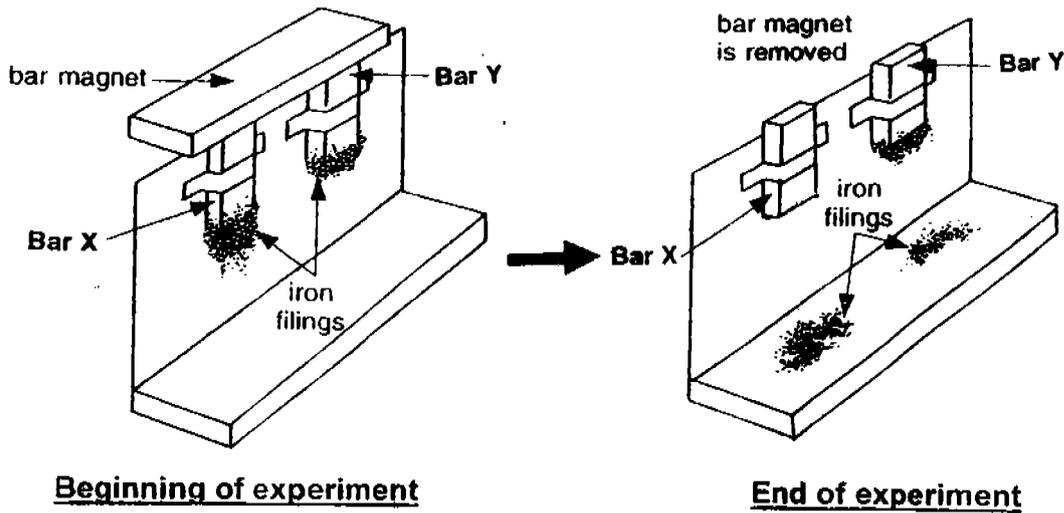
\_\_\_\_\_

- (c) His teacher advised him to add **small weights, one at a time**, in this experiment. Explain why it is important to do so.

\_\_\_\_\_

\_\_\_\_\_

44. Javan conducted an experiment using a bar magnet as shown below.



(a) What happened to the iron filings on bar X and bar Y when the bar magnet was removed?

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(b) Javan wants to make a doorbell model for his Master Scientist project. Which bar, X or Y, should he use in his model? Give a reason for your answer.

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45. Wen Yun carried out an experiment on the germination of seeds.

She set up Jars A, B and C. Three days later, she lowered a lighted candle into Jar A using a wire and recorded the time the candle burned before going out. She repeated the same procedure for jars B and C.

The table below shows the results of her experiment.

Jar	Condition in jar	Length of time the candle burned before going out (seconds)
A	Empty	36
B	Contained seeds on dry cotton wool	32
C	Contained seeds on moist cotton wool	12

(a) What can Wen Yun conclude about the dry seeds from her observation of Jars A and B?

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(b) Give 2 reasons why the candle went out faster in Jar C than in Jar B.

(i)

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(ii)

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46. You are required to design an experiment to show that there is water in the soil using **only** the materials provided below.

- one small flower pot
- one transparent plastic bag
- one thick rubber band
- some garden soil

(a) Write the steps for your experiment.

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[1]

(b) What observation could you make to infer that there is water in the soil?

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(c) What additional set-up should you have to enable you to conclude that there is water in the soil?

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**END OF PAPER**

SAL

MAHA BODHI SCHOOL  
2005 PRELIMINARY EXAMINATION  
SCIENCE  
PRIMARY 6

- 1) 2
- 2) 1
- 3) 4
- 4) 1
- 5) 2
- 6) 2
- 7) 4
- 8) 1
- 9) 2
- 10) 3
- 11) 1
- 12) 3
- 13) 3
- 14) 2
- 15) 3
- 16) 1
- 17) 3
- 18) 4
- 19) 2
- 20) 2
- 21) 3
- 22) 2
- 23) 3
- 24) 3
- 25) 2
- 26) 3
- 27) 3
- 28) 3
- 29) 4
- 30) 1
- 31) i) A  
ii) C  
iii) F  
iv) B
- 32) a) Gravitational potential energy  
b) Gravitational potential energy --- heat energy + kinetic energy.
- 33) a) Duckweed --- tadpoles --- water beetles --- snakehead.  
b) i) duckweed  
ii) water beetle  
c) The number of tadpoles will decrease. When the number of snake decreases, the number of water beetles increases as there will be lesser snakeheads eating up the water beetles. The number of tadpoles will then decrease as more water beetles will eat them up.
- 34) a) When the number of burning candle increases, the number of burning time decreases.  
b) When there are more candles in the jar, more oxygen is used up. This will cause the oxygen supply in the jar to run out faster, causing the candle to go out faster.
- 35) a) They wanted to find out which material absorbs the most amount of water  
b) All
- 36) a) They have a hollow sac and the inner surface of the sac has many stomata.  
b) Ants enter through the hole and give out their waste materials which are broken down into simple substances and absorbed by the roots in the inner surface of the sac.

37) a) 12°C

b) Sand heats up and cools down faster than water.

38) a) P - oxygenated blood

Q - de-oxygenated blood

R - de-oxygenated blood

S - oxygenated blood

b) It is to pump blood to all parts of our body to keep us alive.

39) a) They both have a nucleus, cytoplasm and a cell membrane

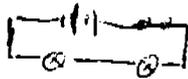
b) Cell A and B are plant cells. Both cells have cell walls.

40) a) Air takes up space. When the clip is closed, air cannot escape.

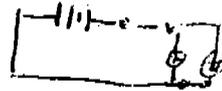
b) i) Water in the basin would increase.

ii) Air bubbles can be seen on the underside of the beaker.

41) a) Draw circuit with three lamps  
three (must show standard symbols)



b) Lighting in the house



42) a) She wanted to find out if the diameter of wheel affects the effort required to lift the load.

b) Yes. She only changed 1 variable (the diameter of the wheel) and kept all the other variables the same.

c) Q, P, R, S

43) a) i) The distance between the two desks.

ii) Position the scale pan is suspended from the beam.

b) He should measure the number of weights needed to make each other collapse.

c) When he used big weights, the results will not be as accurate as when he uses the small weights.

44) a) Some iron fillings dropped from Bar Y but all the iron fillings dropped from Bar X.

b) X. When a magnetic substance is used, the switch will be stuck to it. and the bell will ring non stop, so he should use a non-magnetic substance so the switch will not be attracted to it and it will ring only when switch is closed.

45) Dry seeds respire and used up oxygen.

b) i) There was less oxygen in Jar C than in Jar B because

- 45) b) ii) There was more carbon dioxide in Jar C than in Jar B because the germinating seeds give out more carbon dioxide and carbon dioxide does not support burning.
- 46) a) 1) Put the garden soil in the flower pot.  
2) Cover the pot with the transparent plastic bag.  
c) Tighten the bag with the rubber band tied around the side of the pot.
- b) There will be water droplets on the inner side of the plastic bag.
- c) Have a similar set-up using an empty flower pot to act as a control.