AI TONG SCHOOL

2013 CONTINUAL ASSESSMENT (1)
PRIMARY SIX SCIENCE

DURATION: 1hr 45 min

DATE: 7 March 2013

INSTRUCTIONS

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

Name : _____ ( )

Class : Primary 6 _____

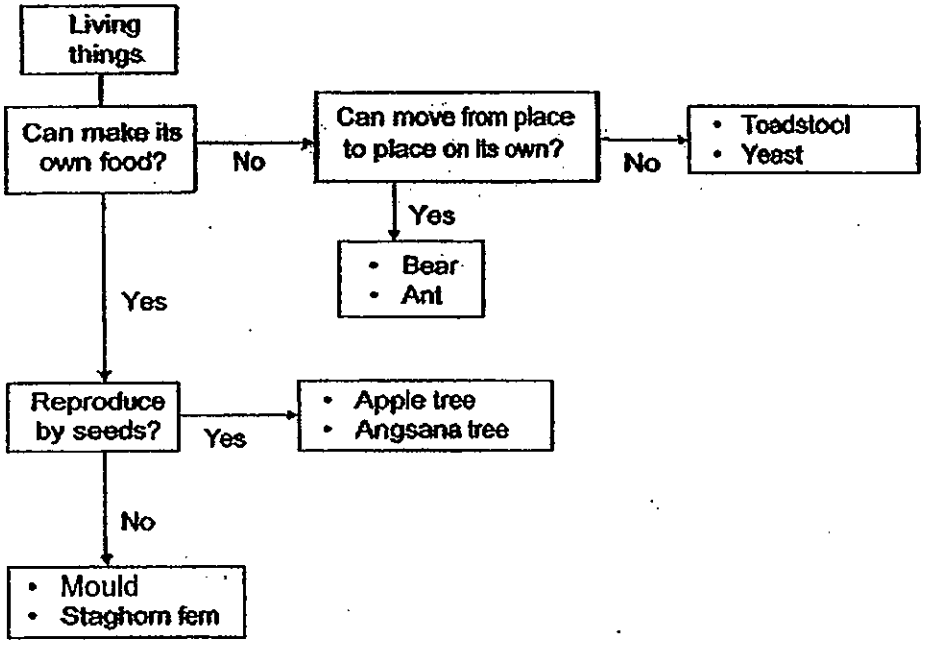
Parent's Signature : _____

Date : _____

Booklet A	60
Booklet B	40
Total	100

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

1. Study the flow chart below carefully.



Based on the flowchart, which living thing has been wrongly placed?

(1) Mould
(2) Yeast
(3) Staghorn fern
(4) Angsana tree

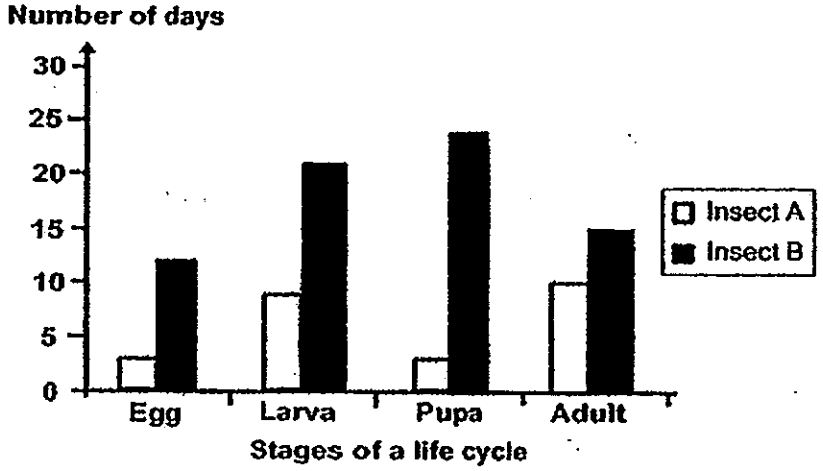
2. Samuel kept four mealworms, A, B, C and D, each at different stages of their life cycles, in four containers. He placed 20 g of food next to each of them. He measured the mass of food left in the containers after 2 days and recorded the results in a table.

Mealworm	Mass of food left
A	7 g
B	12 g
C	10 g
D	20 g

Which mealworm is most likely in the pupa stage?

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

3. Sam compared the life cycle of two insects, A and B. He recorded the number of days each insect took to complete the various stages of their life cycles.

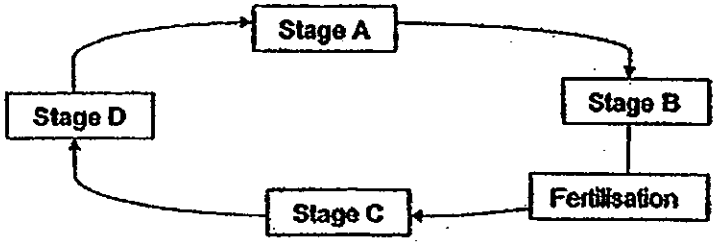


Based on the above graph, which of the following statements is/are correct?

A Insect A eats the most amount of food when it is an adult.
B The two insects have the same number of stages in their life cycles.
C Insect B spent the greatest amount of time as a pupa than in the other stages.
D Each insect took the same number of days to complete each stage of their life cycle.

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

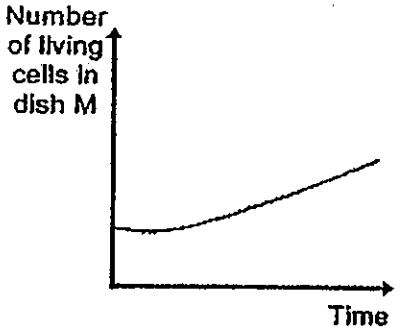
4. The diagram shows the life cycle of a butterfly.

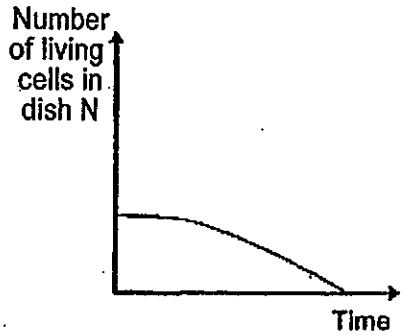


Based on the life cycle as shown above, what is Stage C?

(1) Egg
(2) Larva
(3) Pupa
(4) Adult

5. Naomi placed the same number of a type of single-celled organism in 2 dishes, labelled M and N. She left Dish M under a light source and placed Dish N in the dark. She monitored the number of living organisms in dishes M and N over a few days and plotted a graph as shown below.

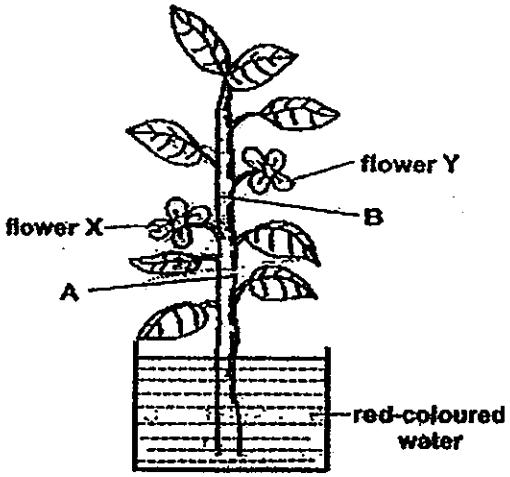




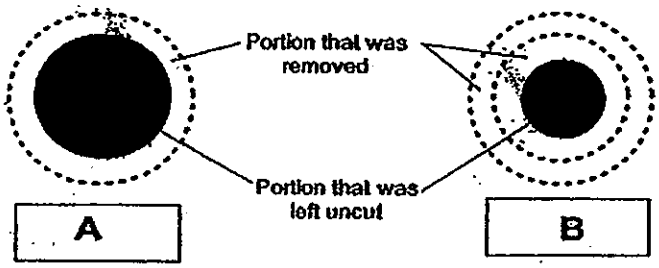
Based on the above information, Naomi aims to find out if _____.

(1) the organisms in dish M can grow better than those in Dish N
(2) the number of organisms in dishes M and N will change with time
(3) light is necessary for the survival of the organisms in dishes M and N
(4) the amount of time the organisms are kept in the dark affect their growth

6. Two rings of the stem were cut off at different depths at A and B as shown below. The plants were then placed in a beaker of red-coloured water. After a while, flower X turned red while flower Y remained white.

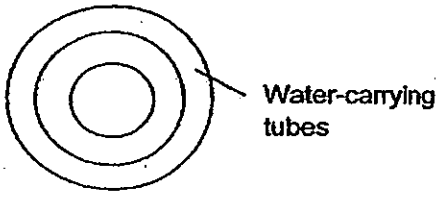


The diagrams below show the cross sections of A and B of the stem. The unshaded regions show the areas that were removed while the shaded regions show the areas that were uncut.

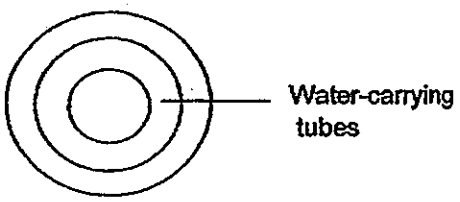


Which one of the following cut-sections correctly shows where the water-carrying tubes are located?

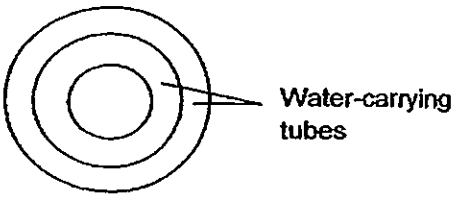
(1)



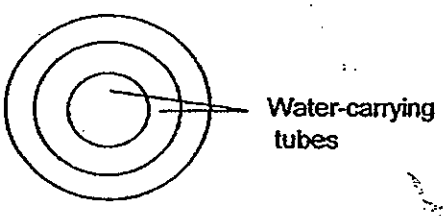
(2)



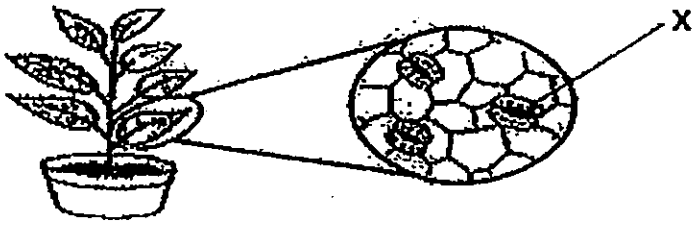
(3)



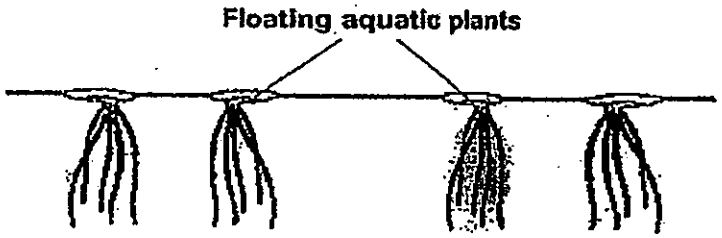
(4)



7. Using a microscope, Darren observed the leaf of a potted plant as shown below. He noted that more X could be found on the underside of the leaves than the upper surface of the leaves.



He then used the microscope to observe the leaves of some floating aquatic plants as shown below. He noted that there are more X found on the upper surface of the leaves than the underside of the leaves.



Which one of the following statements best explains why there is a difference in where more X can be found between the potted and the aquatic plant?

(1) The aquatic plant receives less sunlight than the potted plant.
(2) The underside of the leaves of the aquatic plant are in contact with water not air.
(3) The potted plant carries out gaseous exchange at a faster rate than the aquatic plant.
(4) The aquatic plant takes in more atmospheric oxygen than dissolved oxygen in the water.

8. Gordon cut open a watermelon fruit and observed that it contained many seeds.

Based on this observation, he made the following statements about the flower of the watermelon.

Which one of the following statements best supports his observation?

(1) The flowers grow in bunches.
(2) The flower produces many pollen grains.
(3) There are many ovules in the ovary of the flower.
(4) The flower contains a lot of nectar to attract insects.

9. Which of the following statements about sexual reproduction in both plants and animals are true?

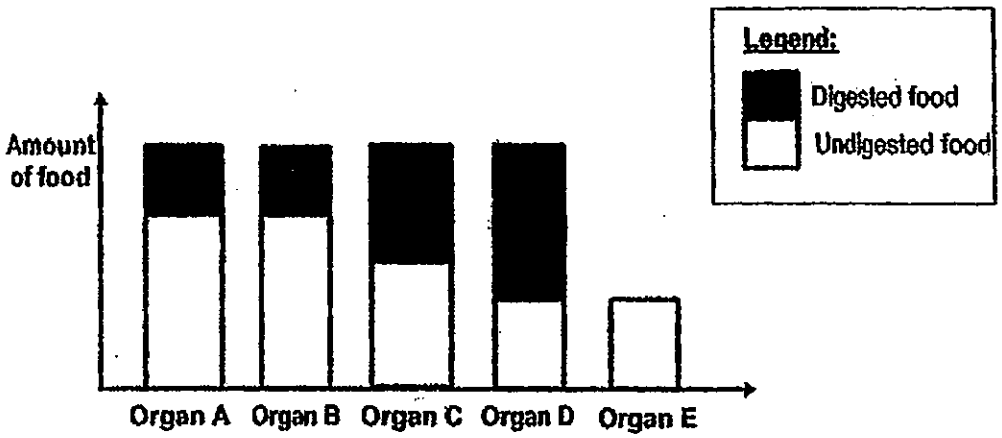
A The female sex cells are produced in the ovary.

B The process of pollination takes place before fertilisation.

C The male sex cells produced are called spores.

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

10. Peter ate Food Q. The bar graph below shows the amount of digested and undigested Food Q in 5 organs, A, B, C, D and E of his digestive system over 3 hours.

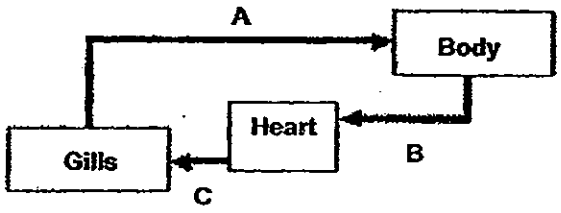


Based on the graph, which of the following organs did not carry out any digestion of Food Q?

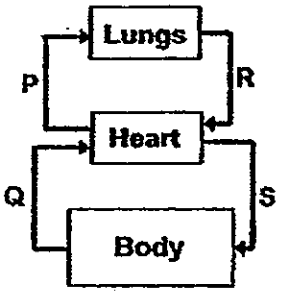
(1) A and B only
(2) B and E only
(3) C and D only
(4) D and E only

For questions 11 and 12, refer to the diagrams below.

A, B and C represent the blood vessels of the fish circulatory system. P, Q, R and S represent the blood vessels of the human circulatory system.



Circulatory system of a fish



Circulatory system of a human

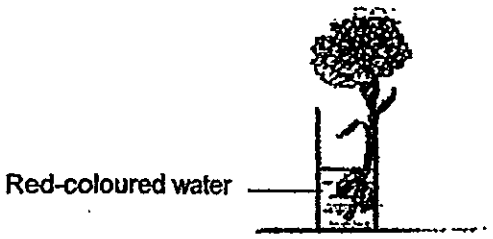
11. Which one of the following pairs of blood vessels carries oxygenated blood?

(1) A and S
(2) B and Q
(3) C and R
(4) C and P

12. Based on the diagrams above, which one of the following statements is incorrect?

(1) Gaseous exchange takes place at the gills and lungs.
(2) In the fish circulatory system, blood passing through the heart will be pumped back to the body.
(3) In the human circulatory system, blood passing through the heart will be pumped back to the lungs and body.
(4) Blood circulates in one direction in the fish circulatory system but blood circulates in two directions in the human circulatory system.

13. Jo plucked 4 stalks of flowers, A, B, C, and D, from the same plant and placed each of them in a beaker of red-coloured water kept at different temperatures as shown in the diagram below.



She recorded the time taken for the flowers to turn red in the table below.

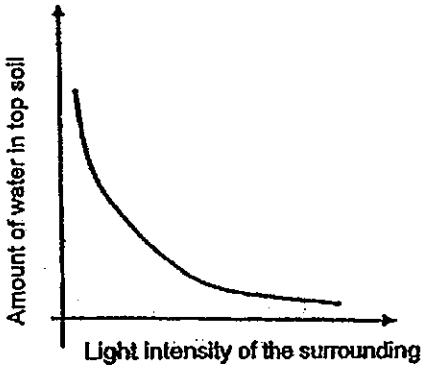
Temperature of water (°C)	20	25	30	35
Time taken for flower to turn red (days)	2	1.5	1	0.5

Based on the experiment, which statement is incorrect?

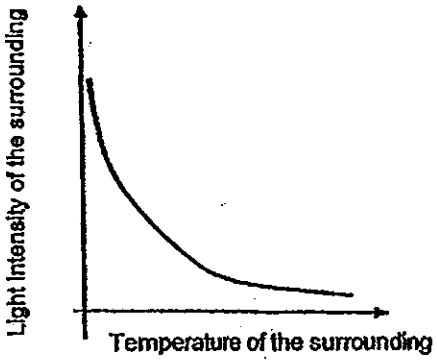
(1) As the time taken for the flower to turn red decreases, the temperature of the water increases.
(2) As the time taken for the flowers to turn red increases, the temperature of the water decreases.
(3) The higher the temperature of water, the faster the red-coloured water travels through the water-carrying tubes.
(4) The higher the temperature of water, the slower the red-coloured water travels through the water-carrying tubes.

14. Which one of the following graphs correctly shows the interaction between the two factors found in a natural environment?

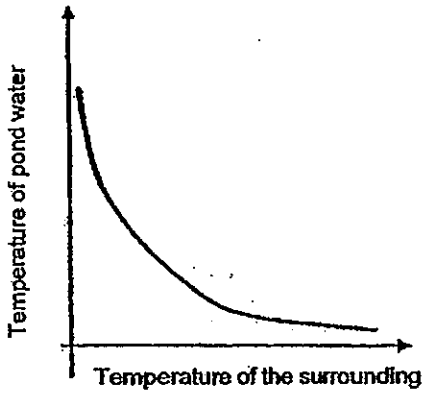
(1)



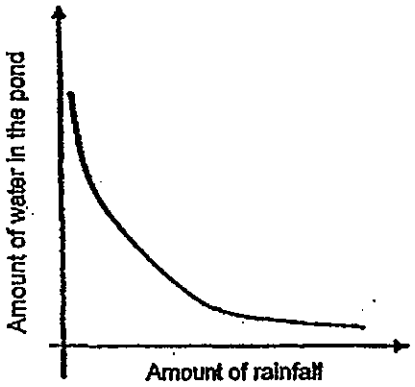
(2)



(3)

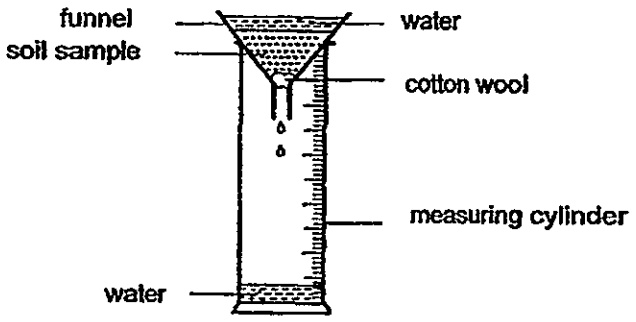


(4)



15. Andy was told that the more air spaces a type of soil had, the faster the soil would allow water to flow through. Andy collected 4 soil samples, E, F, G and H.

He put 50 g of soil sample E in the set-up as shown below.



He poured 100ml of water into the funnel and measured the time taken for 30ml of water to be collected in the measuring cylinder. Then he repeated the experiment for soil samples F, G and H.

The student recorded the time taken to collect the water for each soil sample in the table below.

Soil sample	Time taken to collect 30ml of water (s)
E	37
F	14
G	67
H	128

Based on the information above, which one of the following shows the correct arrangement of the soil samples, starting from the one with the greatest amount of air spaces in it to the one that has the least?

(1) E, G, H, F
(2) F, E, G ,H
(3) G, F, H, E
(4) H, G, E, F

16. Organisms H, J, K and L belong to the same community and are interdependent on each other for food. The table below shows the food of Organisms J, K and L.

Organisms	Food
J	H, K
K	H
L	J, K

Based on the information above, which of the following are possible food chains among the four organisms found in this community?

A H ⟶ J ⟶ L

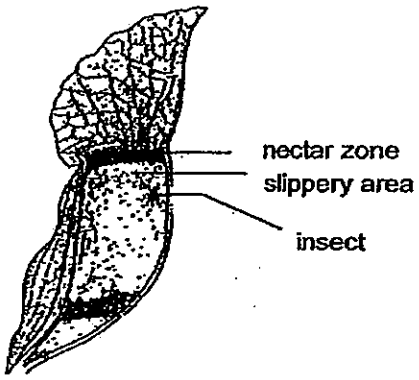
B K ⟶ L ⟶ J

C H ⟶ K ⟶ J ⟶ L

D J ⟶ L ⟶ K ⟶ H

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

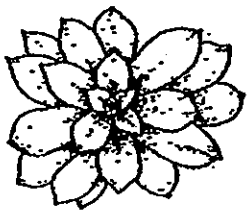
17. The diagram below shows the leaf of plant X which grows in soil that lacks nutrients and is thus adapted to trap insects to obtain more nutrients.



How does the presence of nectar help the pitcher plant to trap insects?

(1) Traps the insects and digest them.
(2) Causes the insects to slip and fall.
(3) Attracts insects to the pitcher plant.
(4) Absorbs nutrients of the digested insect.

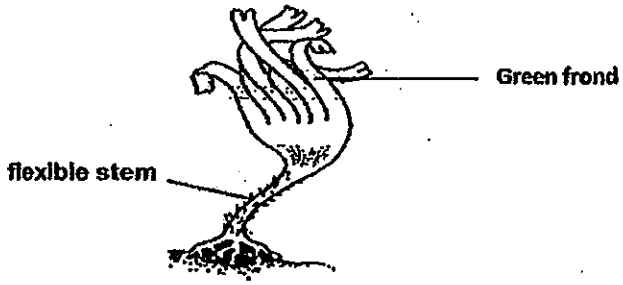
18. The diagram below shows the arrangement of leaves of a plant from the top view. It has been adapted to grow in this manner to benefit the plant.



How does this adaptation help the plant to survive?

(1) It helps the plant to bear more flowers.
(2) It helps the plant to get more sunlight.
(3) It helps to prevent water loss through the leaves.
(4) It helps the plant to attract more insects to pollinate its flowers.

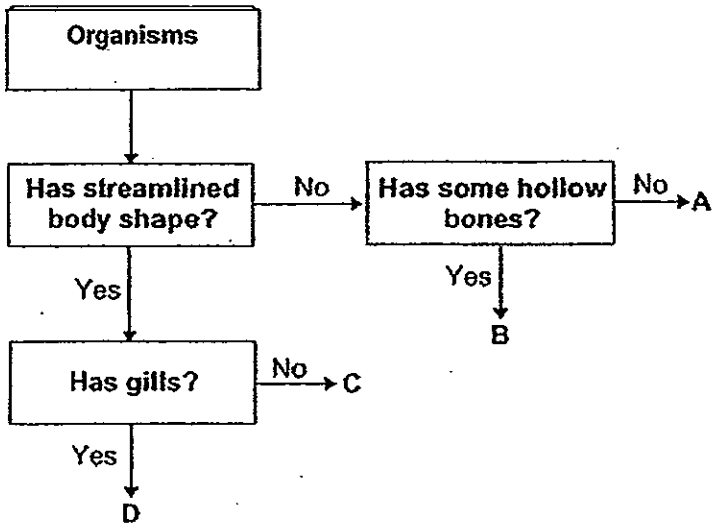
19. The diagram below shows Organism T which grows in the sea. It has a flexible stem. Its green fronds enable it to photosynthesize. Waves often pull Organism T in different directions.



How does having a flexible stem enable Organism T to survive the sea waves?

(1) It holds Organism T upright and attaches it firmly to the seabed.
(2) It enables Organism T to move with the waves to prevent it from breaking at its stem.
(3) It enables Organism T to stretch upwards and trap more sunlight for photosynthesis.
(4) It enables Organism T to transport food from the frond to all parts of the organism.

20. Study the following flowchart carefully.



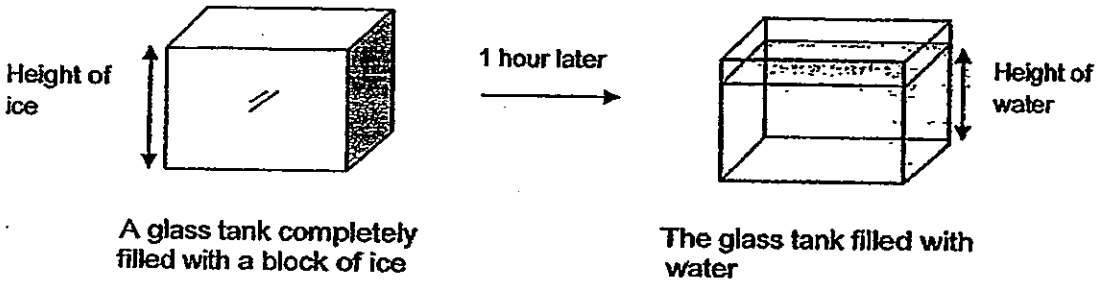
Organism P was discovered living in the pond habitat. The following observations were made about P.

- P cannot fly.
- P is a predator and moves very fast to catch its prey.
- P swims in the water but sticks its head out of the water occasionally to take in air.

Which one of the following best represents Organism P?

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

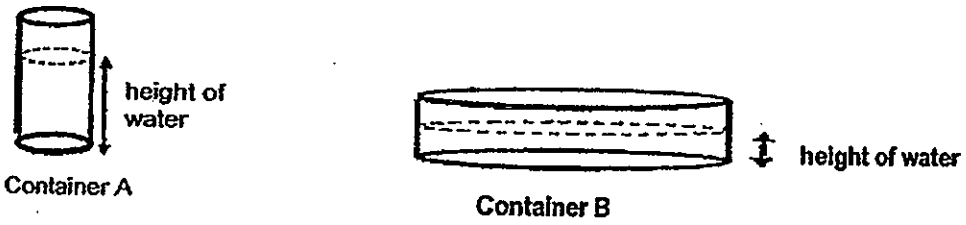
21. The diagram below shows a glass tank completely filled with a block of ice. After 1 hour, it was noticed that the block of ice had melted as shown in the diagram below.



Which one of the following best explains the above observation?

(1) The melted ice has a smaller mass than the ice cube.
(2) The melted ice has a smaller volume than the ice cube.
(3) The melted ice can be compressed to fit the volume of the glass.
(4) The melted ice has definite shape and takes the shape of the glass.

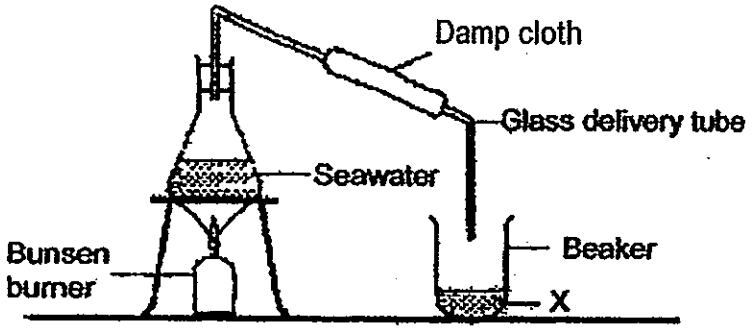
22. Meng poured 250 cm^3 of water at 85°C into each of the two styrofoam containers, A and B, as shown below. The containers of water were left in a room with a temperature of 25°C.



Which one of the following is a likely observation that Meng would make at the end of 15 minutes?

(1) The temperature of water in Containers A and B are the same.
(2) There is no difference in the height of water in Containers A and B.
(3) There is a greater decrease in the height of water in Container B than in A.
(4) There would be water droplets on the outer surface of Containers A and B.

23. Siew Yan set up an experiment as shown below.

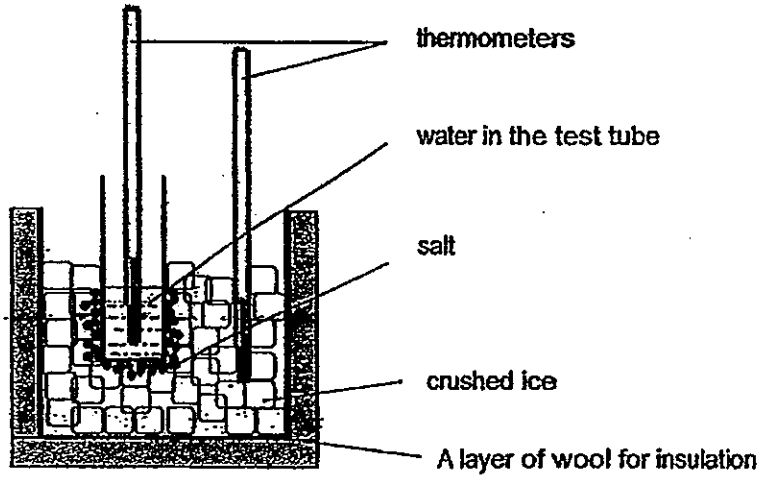


After some time, some water is seen dripping from the glass delivery tube into the beaker.

What can Siew Yan do to slow down the rate of water dripping from the delivery tube?

(1) Use a warmer damp cloth.
(2) Use a longer delivery tube.
(3) Increase the amount of seawater to be heated.
(4) Increase the number of Bunsen burners used to heat the seawater.

24. Sam set up the experiment shown below to find out the effect of adding salt into the crushed ice on the water in the test tube.



He measured the changes in the temperature of the crushed ice and water at a 1 minute interval and tabulated the results in the table below.

Time (min)	Temperature of crushed ice (°C)	Temperature of water (°C)
0	0	30
1	-1	10
2	-5	0
3	-5	0
4	-7	-1
5	-8	-2

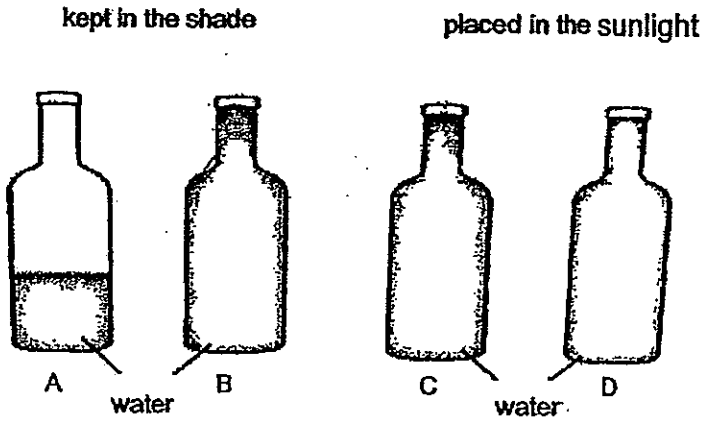
Based on the results, in what state is the water in the test tube at the 2nd min?

(1) gas only
(2) solid only
(3) liquid only
(4) solid and liquid

25. Peiling wanted to find out if water kept in the shade will be less hot than water left in sunlight. She prepared 4 bottles of water, A, B, C and D as shown in the table below.

Bottle	Material of bottle	Initial temperature of water (°C)
A	Glass	40
B	Plastic	25
C	Glass	40
D	Plastic	25

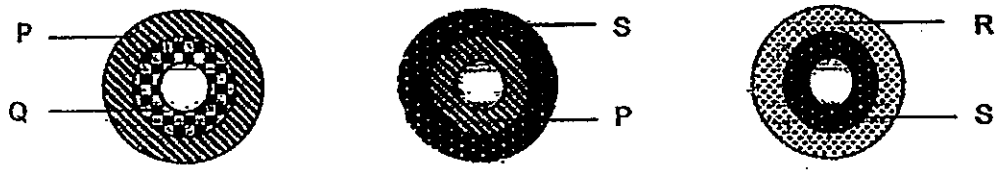
She placed bottles A and B in the shade and bottles C and D in sunlight.



Which of the following set-ups should she compare to arrive at the correct conclusion?

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

26. Four different types of metals, P, Q, R and S, were used to make three sets of rings as shown below. All the sets of rings were similar in size.



Set 1 Set 2 Set 3

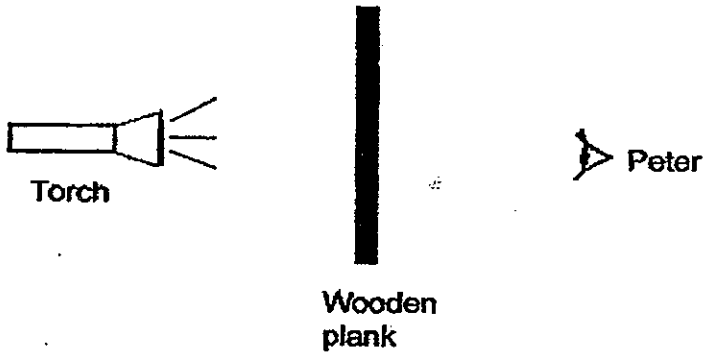
At 25°C, the inner ring of each set fits into the outer ring and could still be pulled out without much effort. After heating the 3 sets of rings to about 60°C, the observations were recorded in the table below.

Observations at 60°C		
Set 1	**Set 2**	**Set 3**
Ring Q fell out of Ring P.	Ring P fell out of Ring S.	Ring S could not be pulled out of Ring R even with a lot of effort.

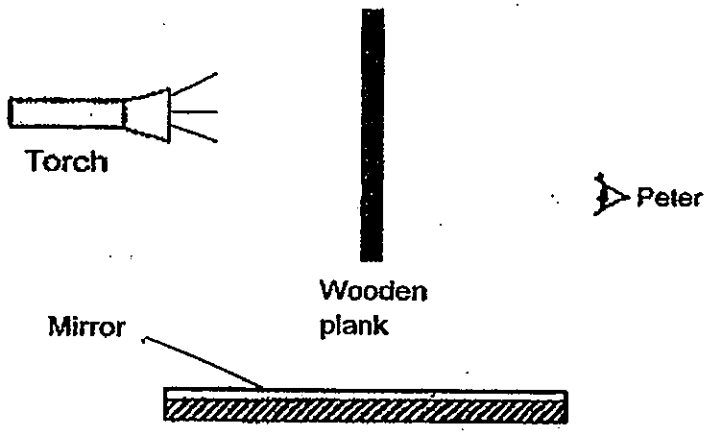
Based on the observations above, which one of the following is true about the metals?

(1) Metal Q expanded the most.
(2) Metal R expanded the least.
(3) Metal S expands more than Metals P and Q.
(4) Metal P expands more than Metals S and R.

27. Peter placed a wooden plank between him and the torch. He realised that he could not see the light from the torch when it was switched on.



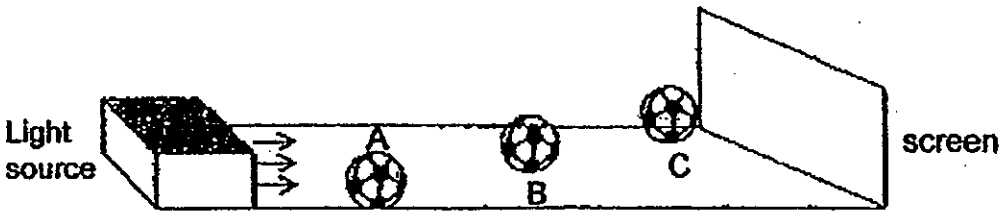
Peter then added a mirror to the set-up as shown below.



Which one of the following correctly explains why Peter can now see the light from the torch?

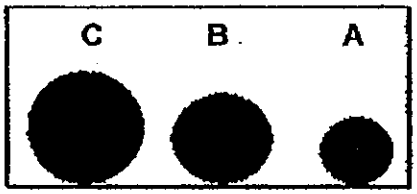
(1) The mirror reflects light from his eyes to the torch.
(2) The mirror reflects light from the torch into his eyes.
(3) The mirror absorbs light from the torch and reflects it into his eyes.
(4) The mirror gives out light so that light from the torch can reach his eyes.

28. The diagram below shows three similar soccer balls, A, B and C, placed at different distances in front of a screen. A light source was switched on and the shadows of A, B and C were cast on the screen.

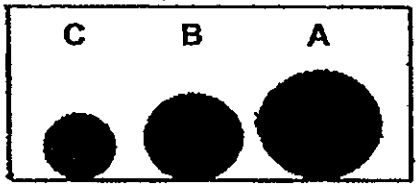


Assuming the soccer balls do not block one another, which one of the following diagrams correctly shows the shadows of the soccer balls A, B and C on the screen?

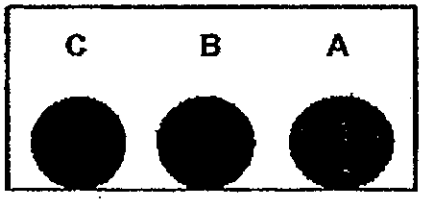
(1)



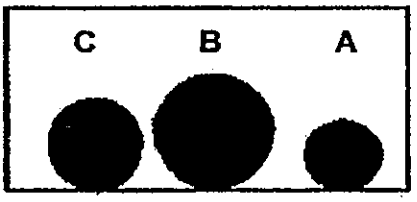
(2)



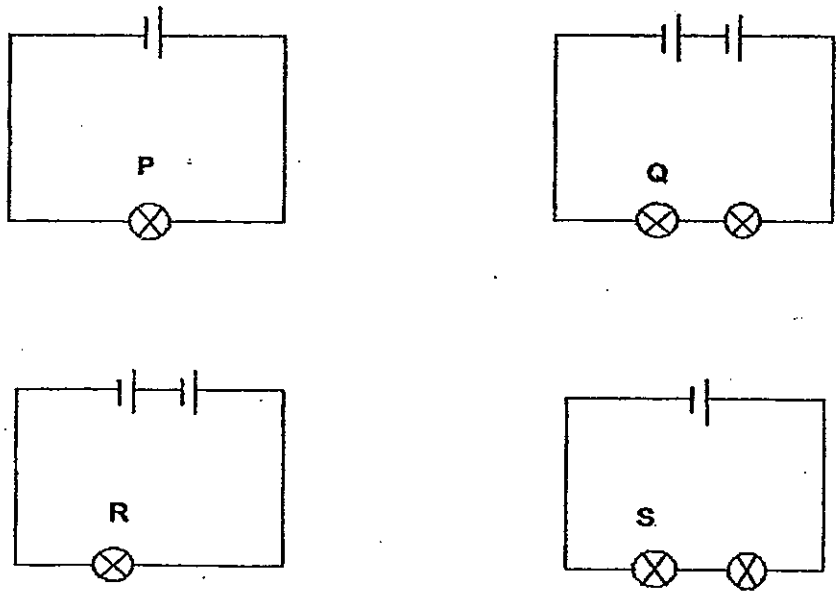
(3)



(4)



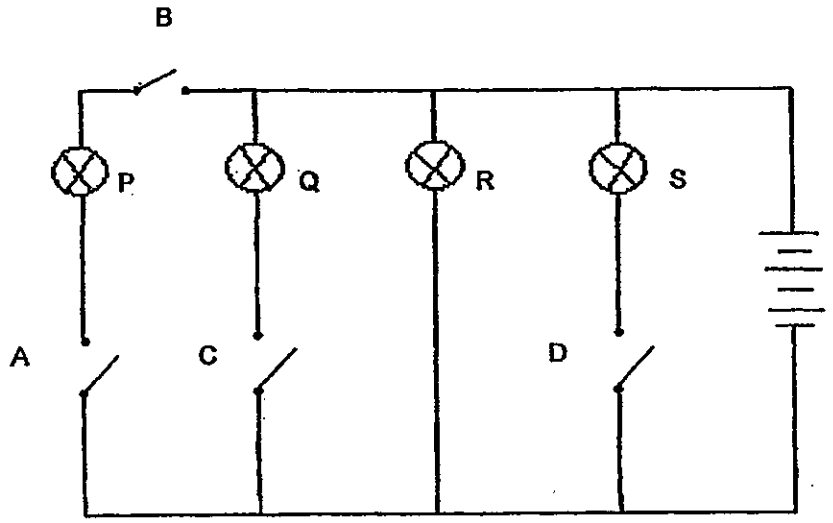
29. The diagram below shows 4 circuits with different arrangements of identical batteries and identical bulbs. The bulbs in all circuits light up.



Which one of the following gives the correct degree of brightness of the respective bulbs P, Q, R and S?

	Brightness of bulb		
	Low	Medium	High
(1)	S	P	Q
(2)	S	Q	R
(3)	Q	R	S
(4)	Q	P	R

30. The diagram below shows a circuit diagram.



The table below shows the number of bulbs that would light up when each switch is turned on.

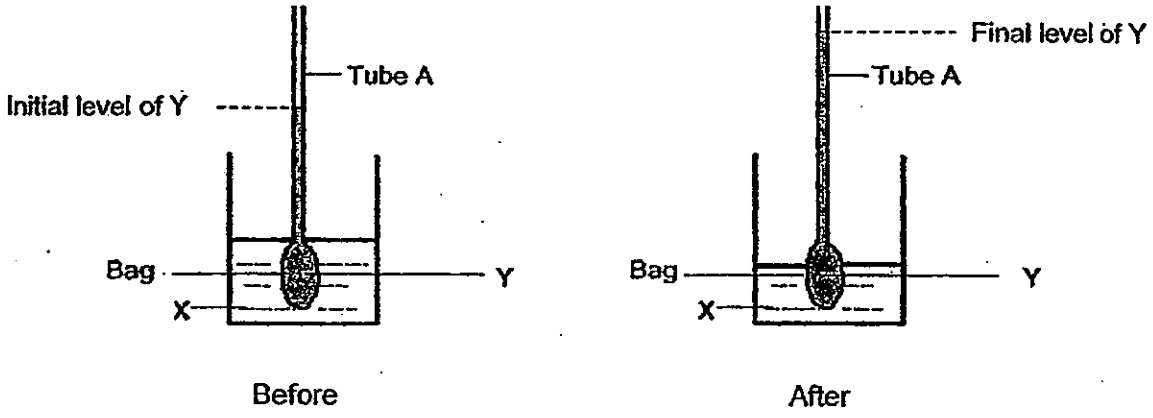
Which one of the following information is incorrect?

	Switch	Number of bulbs lighted up
(1)	A	0
(2)	B	1
(3)	C	2
(4)	D	2

Name:_____ ( )
Class P6 ( )

Section B: 40 marks
Read the questions carefully and write down your answers in the spaces provided.

31. The set-up below shows a bag that contains Liquid Y at room temperature before and after an hour. The bag was immersed in a beaker filled with Liquid X also at room temperature. After an hour, it was observed that the liquid level for Liquid Y increased in Tube A.



(a) Give a reason for the increase in liquid level of Y in Tube A. [1]

_____

_____

An equal amount of liquid X was then poured into three petri dishes containing a muscle cell, a leaf cell and a root hair cell respectively.

It was observed that some of the cells expanded and burst in Liquid X after a while.

(b) Which cell(s) would expand and burst in Liquid X? Give a reason for your answer. [2]

_____

_____

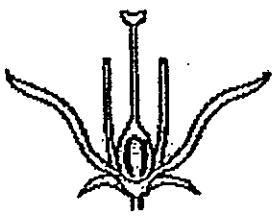
3

32. James carried out an experiment with 3 brightly coloured flowers, A, B and C from the same plant. He removed a certain part from each flower as shown in the diagram below.

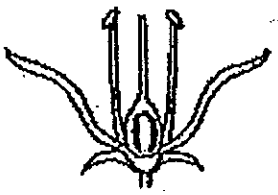
Flower A: The anthers were removed.

Flower B: The stigma was removed.

Flower C: The petals were removed.



Flower A
anther removed



Flower B
stigma removed

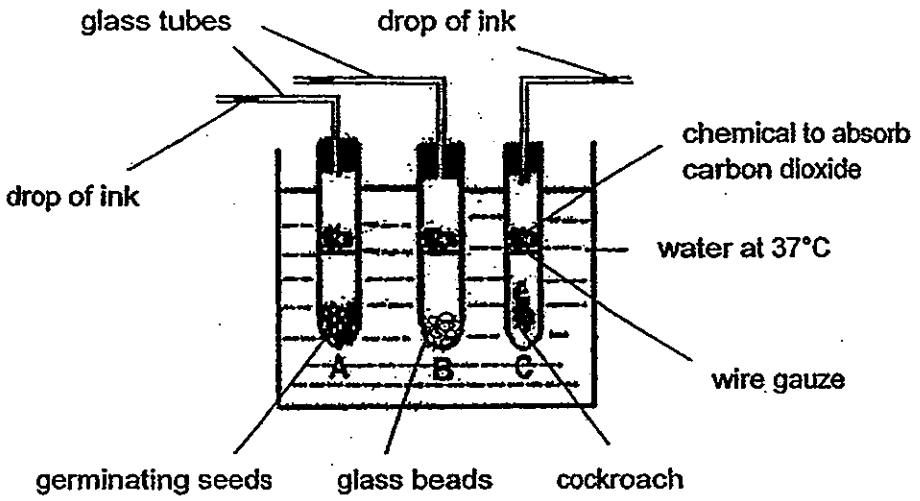
Flower C
petals removed

(a) James dusted pollen grains on the top of each flower. Which flower A, B or C would not be able to bear fruit? Give a reason for your answer. [1]

(b) How does removing only one part from each flower make it a fair test? [2]

3

33. Mr Tan set up an experiment using some germinating seeds and a cockroach as shown in the diagram below. In the set-up, the drop of ink prevents air from entering each of the test tubes, A, B and C. Each test tube also has the same amount of a chemical that absorbs carbon dioxide placed on top of a wire gauze.



(a) It is observed that the drop of ink in glass tubes A and C moved towards the tube. Give a reason for this observation. [2]

_____

_____

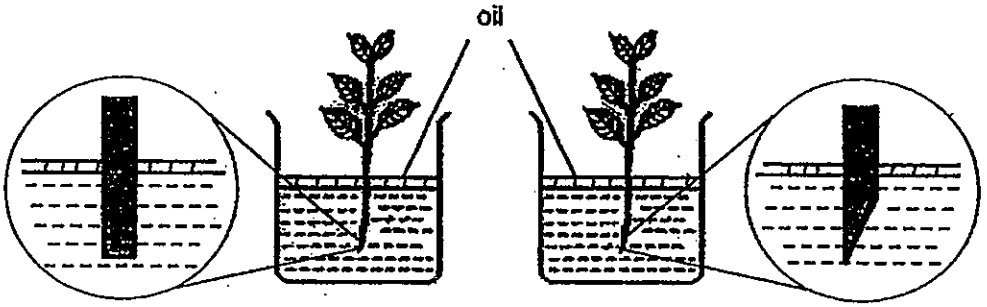
(b) Would the ink drop in the glass tube for test tube B move? Give a reason for your answer. [1]

_____

_____

3

34. Keng Li placed 2 similar plants in Beaker A and Beaker B as shown below. The stem of the plant in Beaker A was left uncut while the stem of the plant in Beaker B was cut at an angle before they were put in the respective beakers as shown in the magnified views below.



Magnified view of uncut stem soaked in water

A

B

Magnified view of cut stem soaked in water

Beakers A and B were left in the open for a week.
The table below shows the volume of water in A and B on Day 1 and Day 7 of the experiment.

Beaker	Volume of water (ml)	
	Day 1	Day 7
A	1500	1450
B	1500	1300

(a) State the volume of water absorbed by

(i) plant in Beaker A:_____ [0.5]

(ii) plant in Beaker B:_____ [0.5]

(b) Explain the difference in the volume of water absorbed by both plants after 7 days. [1]

_____

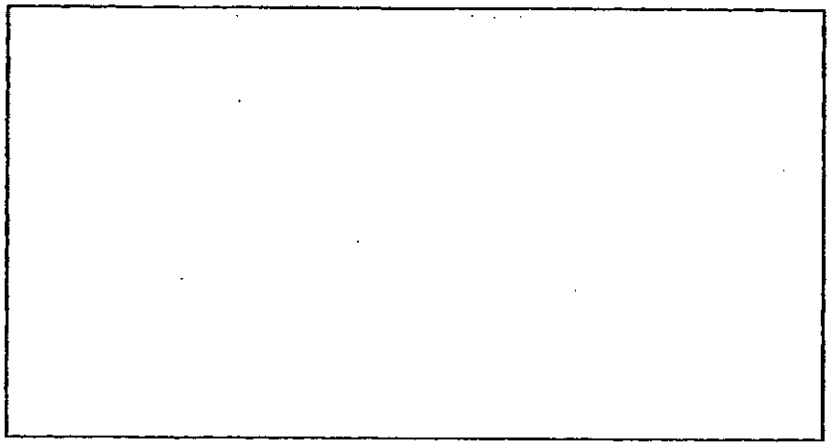
_____

2

35. 4 new organisms, A, B, C and D were discovered in a particular habitat. Scientists found out the following information about them.

A is a plant eater.
B is a predator and a prey.
C is a food producer.
D is a plant and meat eater that eats B and C.

(a) Use the above information to draw a food web in the space below showing the food relationships among these 4 organisms. [2]



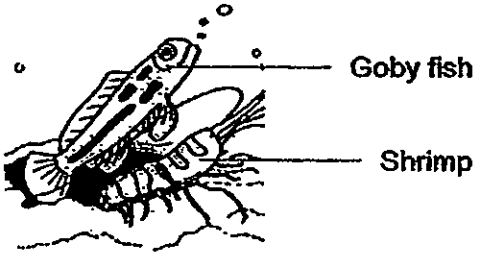
(b) What would happen to the population of B if Organism C was removed from the habitat? [1]

_____

_____

3

36. The Goby fish and its partner, the shrimp, live together in the same burrow on the bottom of the seabed.



	Goby fish	Shrimp
Characteristics	• Feed at the bottom of the sea • Eyes are set high on the top of its head • Bury themselves in the mud	• Feed at the bottom of the sea • Almost blind
Behaviour	• Touches the shrimp with its tail when it sees danger	• Dig and clean up the burrow

The Goby fish and the shrimp help each other to survive.

(a) Based on the given information, state the benefit the following organism receive from its partner: [2]

(i) Goby fish: _____

_____

(ii) Shrimp: _____

_____

(b) How does the position of the Goby fish's eyes help them to survive? [1]

_____

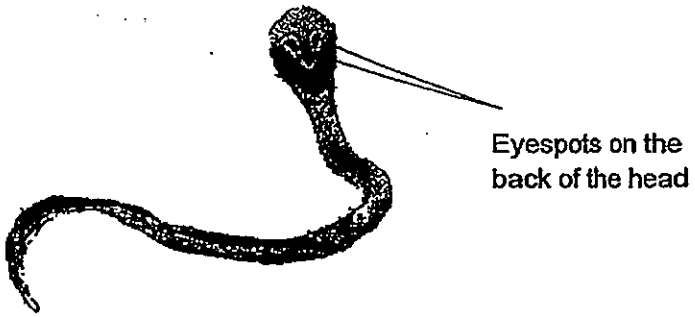
_____

3

37. The diagram below shows a foureye butterfly fish that has eyespots on each side of the body near its tail. An eyespot is an eye-like marking. Its predators are often confused about which is the front end of the fish. Thus the predator does not attack its head and it can survive.

(a) Give a reason why the foureye butterfly fish's eyespot is bigger than its real eye. [1]

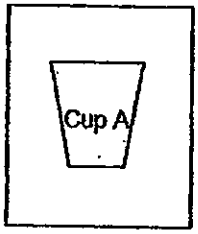
The Indian cobra shown below also has eyespots on the back of its head. It holds up the back of its head, hisses and spits when it is threatened by its predator.



(b) Give a reason why the Indian cobra holds up the back of its head when threatened. [1]

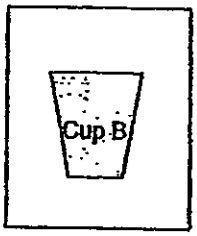
2

38. Cups A and B, made of similar materials, contain an equal volume of water at 90 °C. The cups are placed in Room 1 and Room 2 respectively as shown in the diagram below.



Room 1

Surrounding temperature: 28 °C



Room 2

Surrounding temperature: 16 °C

The temperature of the water in the cups was measured every 5 minutes and recorded in the table below.

	Temperature of water in the cup (°C)						
Cup	**0 min**	**5 min**	**10 min**	**15 min**	**20 min**	**25 min**	**30 min**
A	90	83	75	67	60	52	43
B	90	79	68	59	49	37	27

(a) Which cup of water, A or B, loses heat faster? Explain your answer. [1]

_____

_____

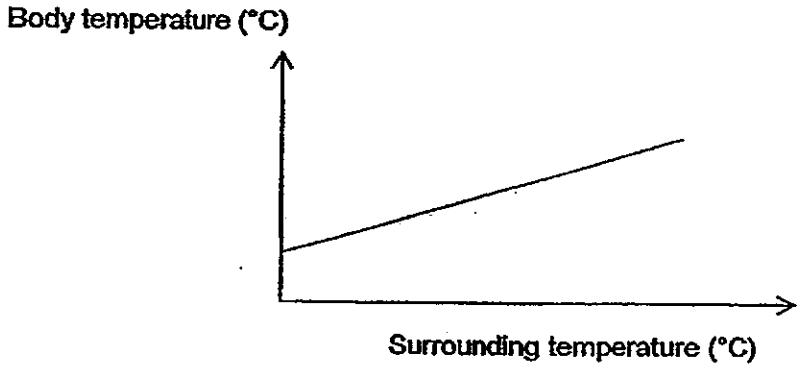
(b) How will the temperature difference between the water in the cup and the room affect the rate of heat loss of the water? [1]

_____

_____

2

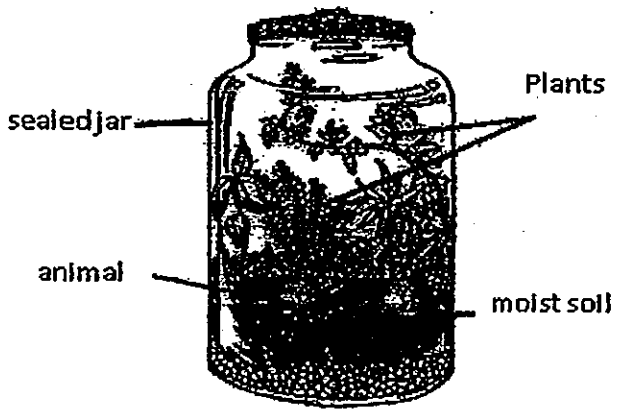
38. The graph below shows how the body temperature of animal X changes with temperature of its surrounding in the cold sea.



(c) Explain how the above adaptation helps Animal X survive in the cold sea. [2]

2

39. Gary set up a self-sustaining terrarium as shown below.



Gary commented that since it is a self-sustaining terrarium, the container can be sealed. He does not need to feed the animals or water the plants at all. However, the terrarium needs energy from the sun which provides warmth for the living things in the terrarium.

Give 2 more reasons how the sun's energy helps the terrarium to be self-sustaining. [4]

Reason 1: _____

_____

_____

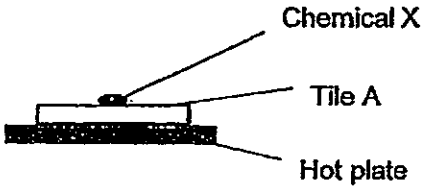
Reason 2: _____

_____

_____

4

40. Henry carried out an experiment to find out the heat conductivity of 4 types of tiles, A, B, C and D of the same size with different surfaces. He placed a drop of Chemical X on Tile A before heating the tile on a hot plate as shown below.



Chemical X is white at room temperature and its colour would change when there is a change in temperature. The diagram below shows how the colour of Chemical X changes.

increasing temperature →

white	light yellow	yellow	yellow orange	orange

After Tile A was heated for 5 minutes, Henry recorded his observations and repeated the experiment with similar sized tiles, B, C and D. His observations were recorded in the table below.

Tile	Colour of Chemical X after 5 minutes
A	yellow orange
B	light yellow
C	yellow
D	orange

(a) Which type of tile, A, B, C or D is the best conductor of heat? Explain your answer. [1]

_____

_____

(b) Which type of tile, A, B, C or D, should Henry use on a roof so that the house would not be hot during the day? Give a reason for your answer. [2]

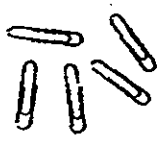
_____

_____

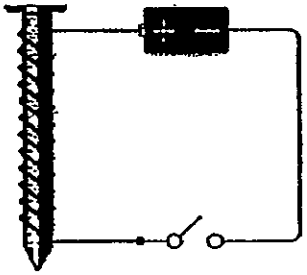
_____

3

41. Andy was given an iron nail coiled in a wire and joined to a battery as shown below. He wanted to find out if the number of coils around the nail affects the strength of the electromagnet.



paper clips

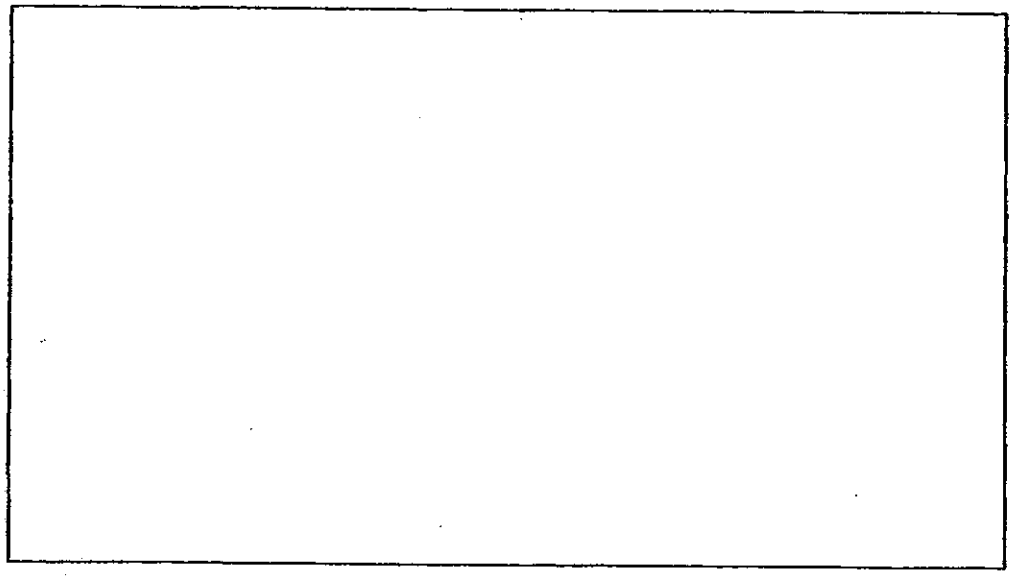


(a) Help Andy by writing down the steps he should take during the experiment in the space below. [2]

Steps	Description of step
1.	Turn on the switch.

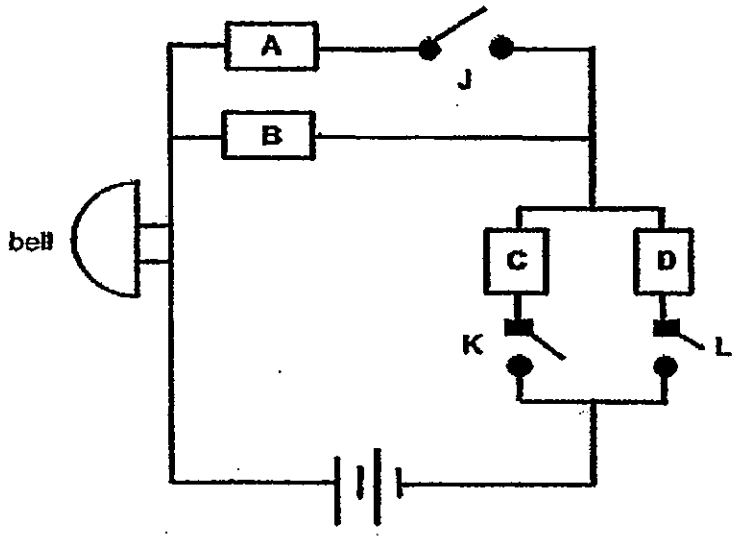
2

41 (b) Draw the expected results of the experiment described above in the space below. Use suitable axes. [2]



2

42. Jun Feng connected a bell to the electric circuit shown in the diagram below to find out if object(s), A, B, C or D allow(s) electricity to pass through it easily.



Jun Feng recorded his observations as shown in the results table below.

Test	Switch J	Switch K	Switch L	Did the bell ring?
1	Closed	Open	Open	No
2	Open	Closed	Open	Yes
3	Open	Open	Closed	Yes
4	Closed	Closed	Open	Yes

(a) What is the purpose of the bell in the circuit? [1]

_____

(b) Jun Feng's teacher commented that Test 1 was not necessary as it would not help him find out if Object A will allow electricity to pass through it easily. Explain why the teacher said so. [2]

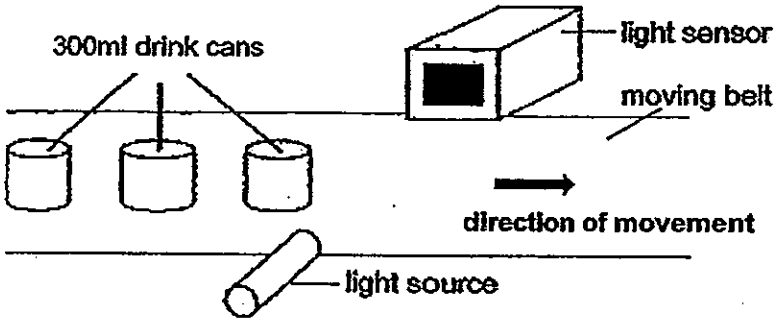
_____

_____

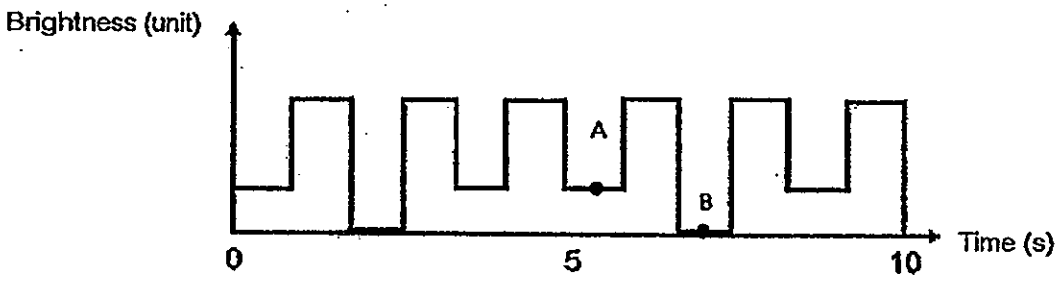
_____

3

43. Alex set up a light sensor to count the number of 300 ml drink cans on a moving belt.



The belt moves at the same speed. As the cans pass between the light source and the sensor, they block light from reaching the sensor. The data recorded is shown in the graph below.



(a) Based on the graph, how many cans could be counted in 10 seconds? [1]

(b) From the graph, points A and B are results obtained from 2 different cans. State whether these cans are translucent or opaque. Explain your choice. [2]

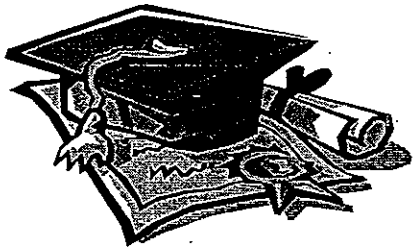
Point A: _____

_____

Point B: _____

_____

3



ANSWER SHEET

EXAM PAPER 2013
SCHOOL : AITONG
SUBJECT : PRIMARY 6 SCIENCE

TERM : CA1

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17
1	4	3	1	3	2	2	3	1	2	1	2	4	1	2	2	3

Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
2	2	3	2	3	1	4	4	3	2	2	2	1

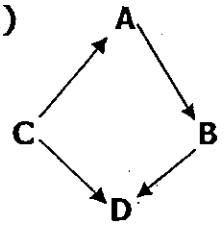
31)a)Liquid X entered the bag.
b)Muscle cell. It does not have a cell wall which maintains the shape of the cell.

32)a)Flower B. The stigma is removed, pollen could not land on it for pollination to take place. Thus, fertilization cannot take place as well.
b)By doing so, only one variable is changed. He can compare and conclude that whether the flowers bear fruit or not is due to the part of the flower that is removed and not any other variables.

33)a)Both the cockroaches and germinating seeds respire and during the process, they take in oxygen and give out carbon dioxide. Since carbon dioxide is being absorbed by the chemical in the test-tube, less air is present to take up the space.
b)No, it would not move. Glass beads are non-living things and they do not respire.

34)a)i)50ml ii)200ml
b)The water-carrying tubes of the plant in Beaker B has an increased exposed surface area to water than the one in Beaker A. Thus, the plant in Beaker B absorbed water at faster rate.

35)a)



b)The population of B would decrease. As organism D eats organism B and C, a decrease in population of C would result in a decrease in population of B since D would eat more of B.

36)a)i)Has a clean environment. ii)Alerted of danger.
b)It helps them to see their predators and preys who are above them even when they are buried in the mud.

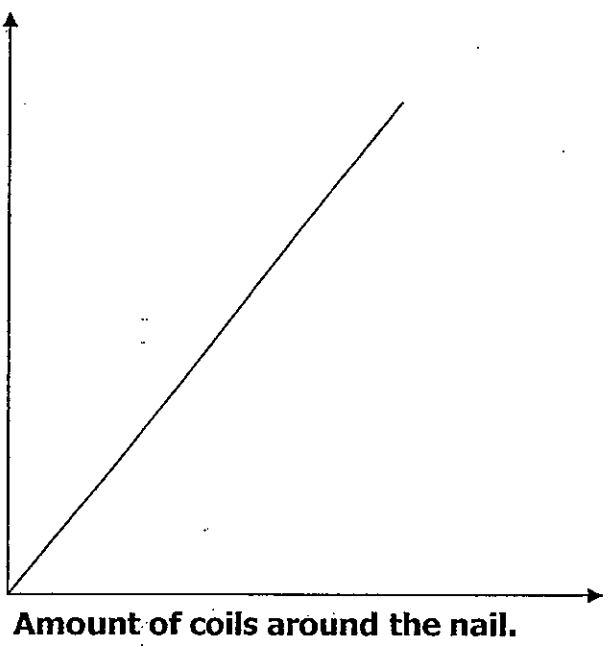
37)a)The bigger eyespots can attract its predators' attention more than the real eyes and make them think that those are their real eyes.
b)The eyespots are more obvious so the predators might think those are the real eyes. The predator will think that the eyespots are the real eyes and they will be frightened by them.

38)a)Cup B. After 30 minutes, the temperature of the water in cup B is lower than the temperature of water in Cup A.
b)When the temperature difference between the water in the cup and the room is larger, the rate of heat loss of the water will be faster.
c)This reduces the temperature difference between the animal and the surrounding so as to reduce heat loss from the animal's body to the surrounding.

39)1)It lets the plants photosynthesis to provide oxygen for the animals living in the jar.
2)The plants produce oxygen for the animals to respire.

40)a)Tile D. Its increase in temperature is the most.
b)Tile B. Its increase in temperature is the least. Thus it will conduct heat the slowest from the sun to the house.

41)a)2)Place it near some paper clips and record the number pf paper clips it attracts.
3)Use the wire to coil more coil around the nait and turn on the switch.
4)Repeat step 2.
5)Repeat the experiment a few more times to calculate the average reading. Compare and conclude the results.

41)b) 

42)a)To find out if electricity is passing through the wires.

b)Opening switches K and L would cause the circuit to be open. Therefore, the bell would not ring even if A allows electricity to pass through it easily.

43)a)6 cans.

b)A: Translucent. Some light was detected.

B: Opaque. No light was detected.