

**NANYANG PRIMARY SCHOOL**

**PRIMARY 6 SCIENCE**

**SEMESTRAL ASSESSMENT 1  
2013**

**BOOKLET A**

**Date : 14 May 2013  
Duration : 1 h 45 min**

**Name : \_\_\_\_\_ (     )**

**Class: Primary 6 (     )**

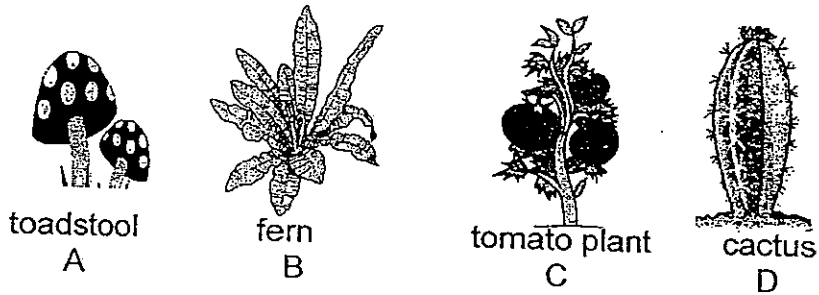
**Parent's signature: .....**

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FOLLOW ALL INSTRUCTIONS CAREFULLY.**

**Booklet A consists of 16 printed pages including this cover page.**



3 The diagram below shows four organisms.

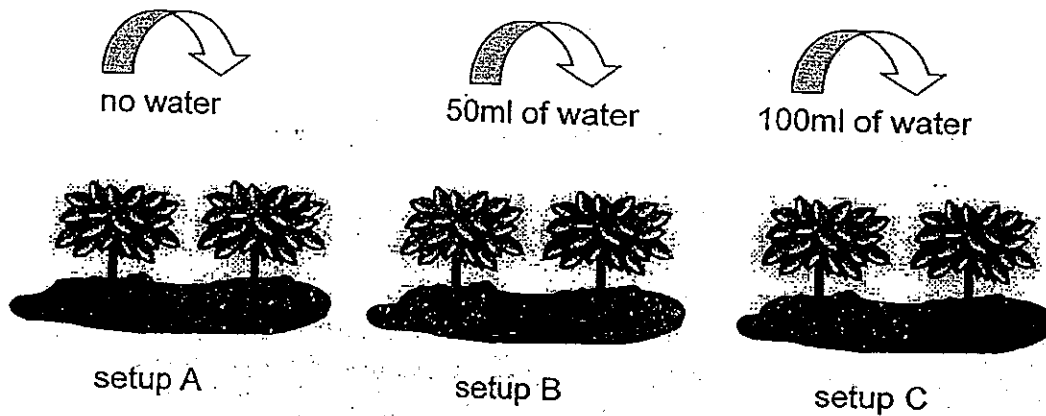


Each organism was kept in a glass tank, A, B, C and D, with the same amount of carbon dioxide in it. The tanks were sealed up and kept outdoors from 12 noon to 5 p.m.

In which tanks would there be an increase in the amount of oxygen after 5 hours?

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

4 Christopher used the setup below to conduct an experiment.

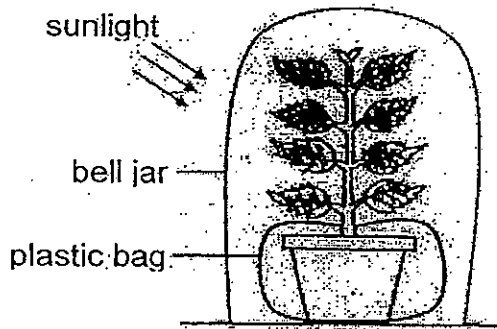


He watered the plants in set-ups B and C every day for a week and observed the three set-ups. The leaves in set-up A were yellow and dry. The leaves in set-up B looked healthy and the leaves in set-up C dropped off easily.

What was the aim of the experiment?

- (1) To find out the effect of different types of water on plants  
 (2) To find out how the amount of water affects plant growth  
 (3) To find out if water is needed for germination to take place  
 (4) To find out if the presence of water affects the growth of plants

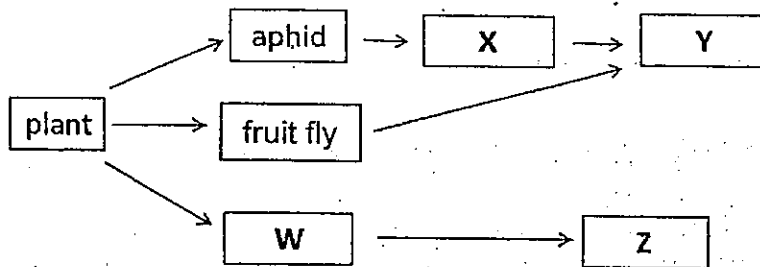
- 5 Sammy applied a layer of clear nail polish varnish on the upper side and underside of every leaf of a well-watered plant. She placed the plant in an airtight bell jar and left the set-up at her brightly-lit balcony.



Which of the following correctly describes the changes in the volume of the different gases in the bell jar after 8 hours?

	Carbon Dioxide	Oxygen	Water Vapour
(1)	remains the same	remains the same	remains the same
(2)	decrease	increase	remains the same
(3)	decrease	increase	increase
(4)	increase	decrease	remains the same

- 6 The diagram below shows a food web.



Which of the following organisms could correctly represent W, X, Y and Z in the food web?

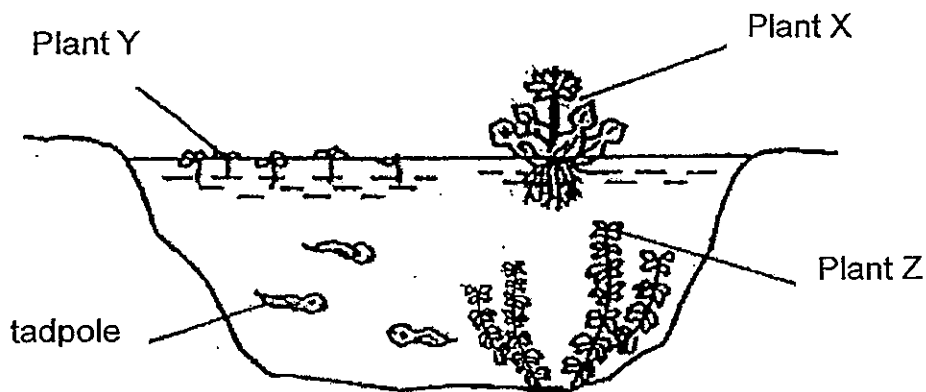
	W	X	Y	Z
(1)	grasshopper	millipede	ladybird	praying mantis
(2)	caterpillar	butterfly	spider	sparrow
(3)	grasshopper	frog	lizard	woodlouse
(4)	butterfly	ladybird	spider	chameleon

7 Which of the following factors will affect the survival of deers in a grassland?

- A Deforestation
- B Long period of drought
- C Increase in number of lions in the grassland
- D Increase in number of horses in the grassland

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

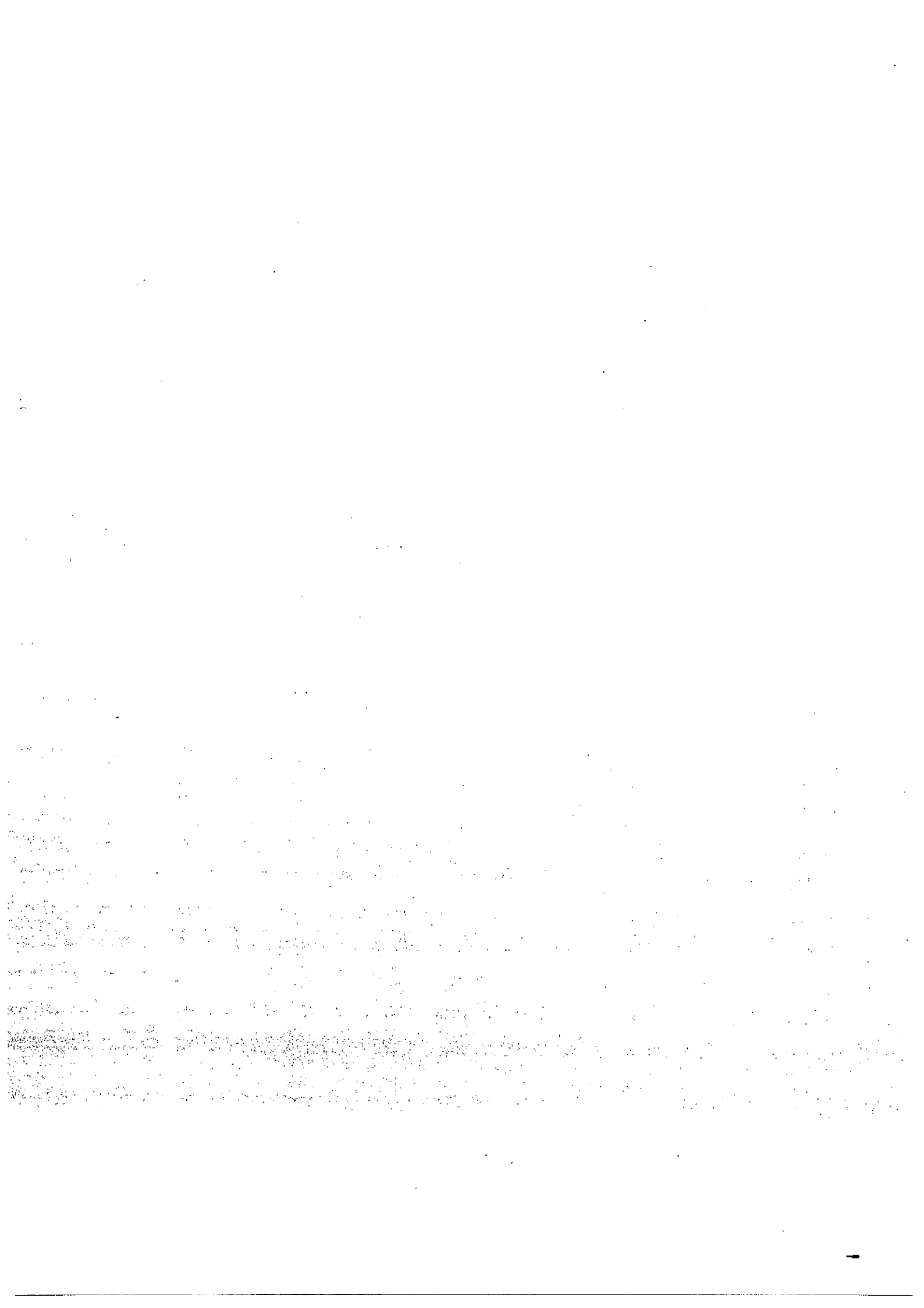
8 Study the diagram below.



Which of the following may be observed after some time if Plant X increased in number rapidly and covered the surface of the pond completely?

- A A decrease in the number of Plant Z.
- B A decrease in the number of Plant Y
- C An increase in the number of tadpoles
- D An increase in the amount of dissolved oxygen in the water

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



9 The following food relationships were observed among four living things, P, Q, R and S.

- ◆ P is eaten by S
- ◆ P feeds on R
- ◆ S feeds on R but not on Q
- ◆ R gets its food from Q

Which one of the following identifies the roles of P, Q, R and S?

	Food Producer	Prey	Predator
(1)	R	Q and S	P and S
(2)	Q	P and R	P and S
(3)	S	P and R	Q and R
(4)	Q	R and S	P and R

10 Larry set up an experiment on tomato plants as described below.

Pot	Location	Type of soil	Size of pot	Amount of water	Number of seedlings	Number of earthworms
A	window ledge	garden soil	large	800ml	10	5
B	window ledge	garden soil	small	800ml	10	5

What was he trying to investigate regarding the growth of the seedlings?

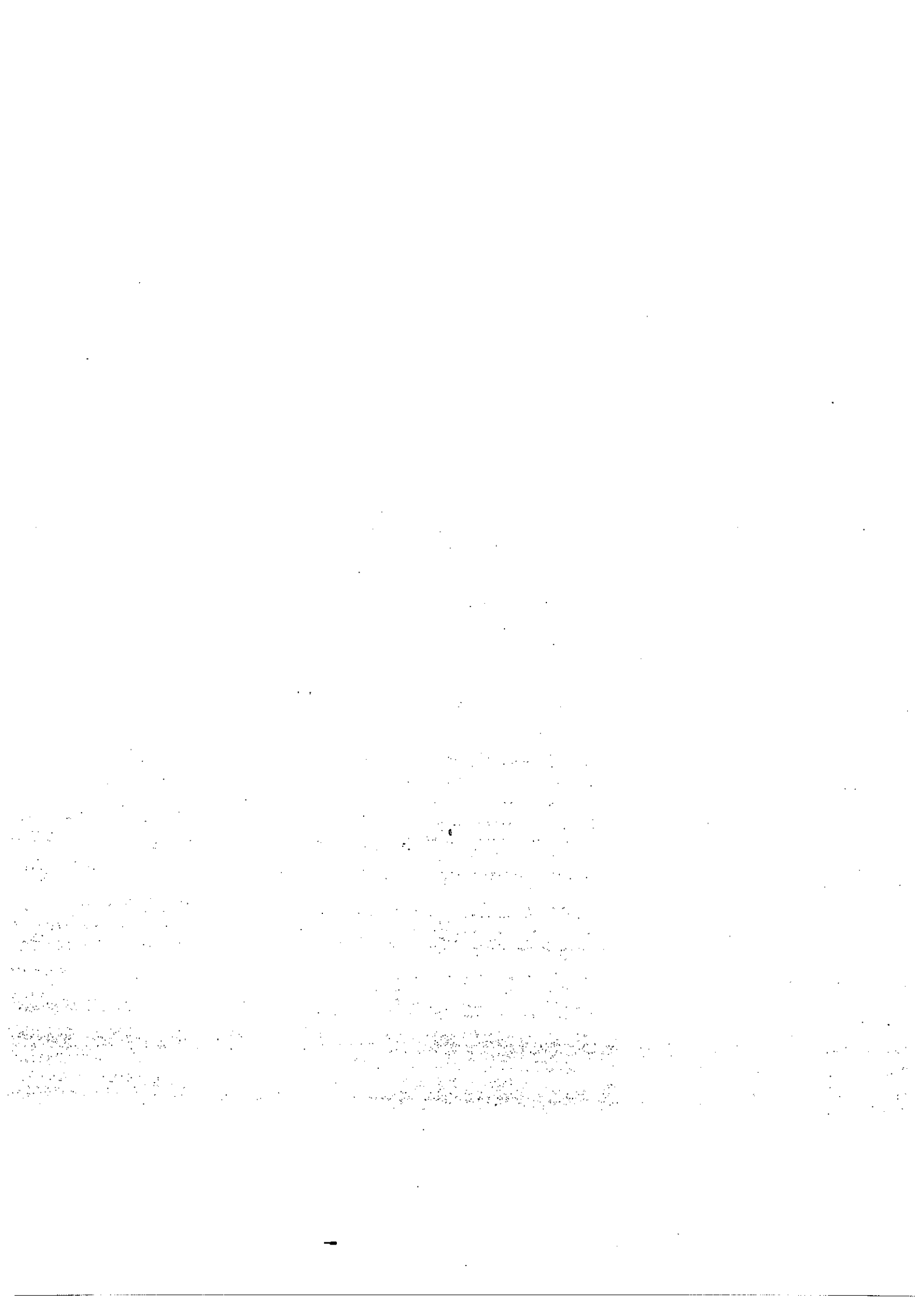
- (1) The effects of overcrowding.
- (2) The effects of water on the growth of the plants.
- (3) The effects of earthworms on the growth of the plants.
- (4) The effects of the type of soil on the growth of the plants.

11 Andrew collected some samples of organisms from a pond near his school. He identified and classified them in the table below.

Aquatic Plants	Aquatic Animals
water moss fern	dragonfly nymph
arrowhead	water boatman
duckweed	pond skater
cabomba	tadpole
hydrilla	guppy
elodea	frog

How many populations of organisms did Andrew collect altogether?

- (1) 10
- (2) 12
- (3) 11
- (4) 13





- 12 Which of the following changes to the conditions in a habitat is **not** correctly matched to how the organisms in that habitat will be affected?

	Changes in the conditions of the habitat	How organism(s) is/are affected
(1)	Forest fire	Decrease in the populations of plants only
(2)	Long periods of dry weather	Decrease in the population of aquatic animal
(3)	Decrease in plant population	Plant eaters compete for food
(4)	Rapid increase in population of animal eaters	Less food is available for animal eaters

- 13 The table below shows the population sizes of Organisms X, Y, and Z over a period of 4 months. The figures were recorded at the end of each month.

Organism	April	May	June	July
X	3800	900	800	479
Y	13000	6500	6300	6400
Z	153	168	170	350

A drought occurred in May. Which of the following statements are **true**?

- A The drought had the least effect on the population of organism Z.
- B Organism X and Y were not able to thrive when there was a drought.
- C The population of organism Y was able to recover faster than that of organism X from the drought.
- D The drought caused the temperature to increase drastically and this led to the decrease in all the populations of organisms.

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

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

- 14 Xiao Bo kept several potted plants in his room. At night, he switched off all the lights and closed all the windows and the door to his room. There was no fresh air entering his room.

Which of the following shows the changes in the amount of gases in his room after 5 hours?

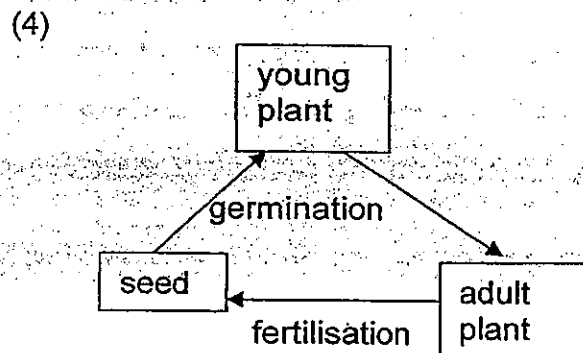
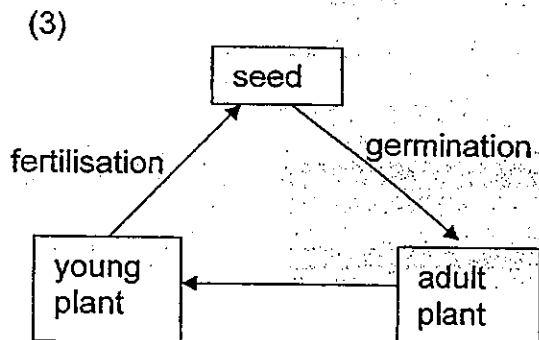
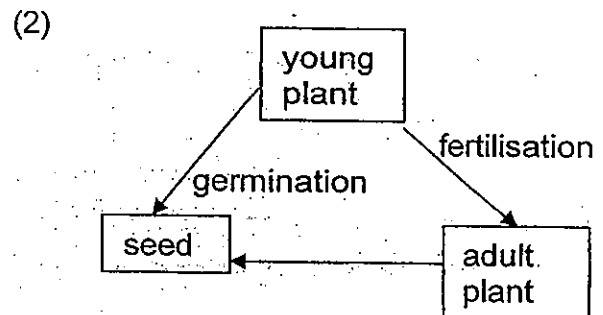
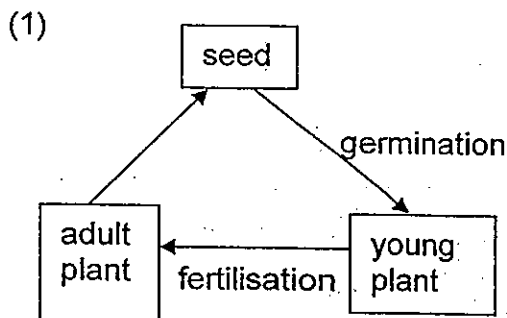
	Oxygen	Carbon dioxide	Water vapour
(1)	increase	increase	no change
(2)	increase	decrease	no change
(3)	decrease	increase	increase
(4)	decrease	decrease	decrease

- 15 Which of the following statements about cells is/are **correct**?

- A Some cells do not have nucleus.  
 B Cells increase in size as the organism grows.  
 C Cells of the same organism are of the same size.

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

- 16 Which one of the following shows the order of stages and processes in the life cycle of a plant?





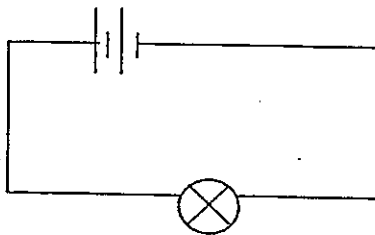
- 21 Joshua placed 2 identical open bottles at the basketball court. He filled one bottle completely with liquid M and the other bottle completely with liquid N. The next day, he observed that the bottle containing liquid M was half-filled but the bottle containing liquid N was completely empty.

Which of the following can he conclude from his observation?

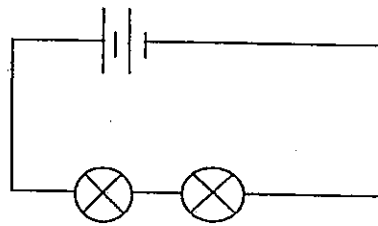
- A Both liquids evaporated.
- B There was a layer of oil on liquid M.
- C Liquid N evaporated faster than liquid M.
- D The temperature of liquid M and N are the same throughout the experiment.

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

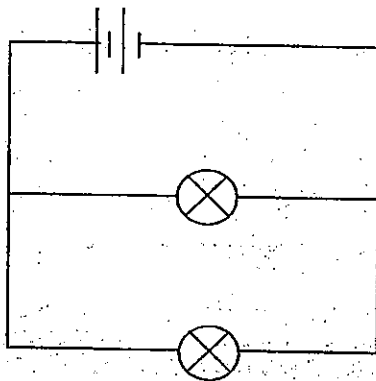
- 22 Study the four circuit diagrams, A, B, C and D, below. The batteries are identical and all the bulbs are lit up.



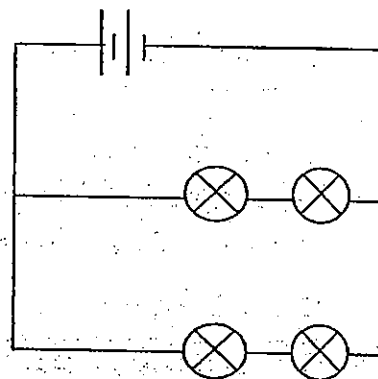
circuit A



circuit B



circuit C

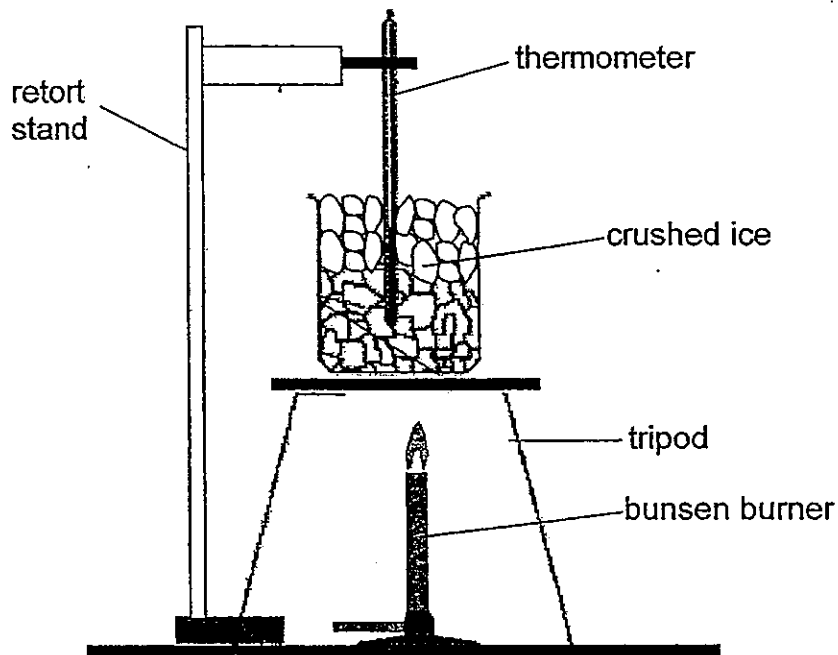


circuit D

Which one of the following statements about the brightness of the bulbs is correct?

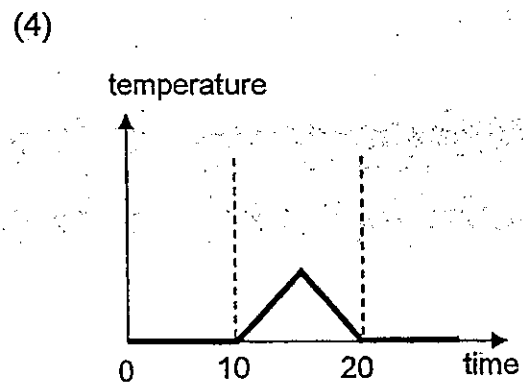
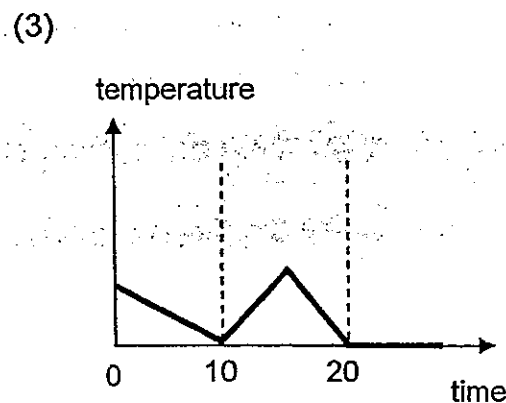
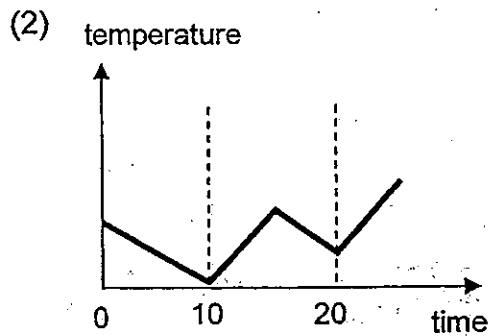
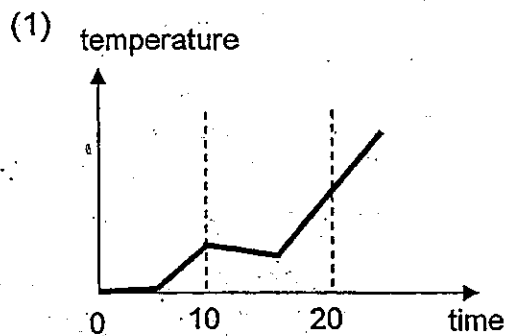
- (1) Each bulb in circuit D is brighter than the bulb in circuit A.
- (2) Each bulb in circuit B is as bright as each bulb in circuit C.
- (3) Each bulb in circuit C is brighter than each bulb in circuit D.
- (4) The bulb in circuit A is brighter than each bulb in circuit C.

- 23 Darius heated up half a beaker of crushed ice for 10 minutes. He then filled up the beaker with more crushed ice. He continued heating the beaker for another 10 minutes.



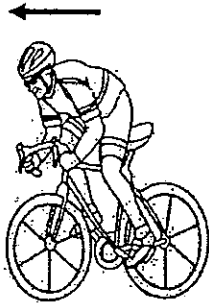
He measured the temperature in the beaker throughout the experiment.

Which one of the following graphs below shows the reading that he would observe?





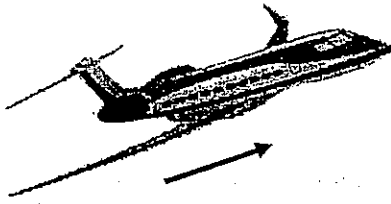
26 The diagrams below show four activities.



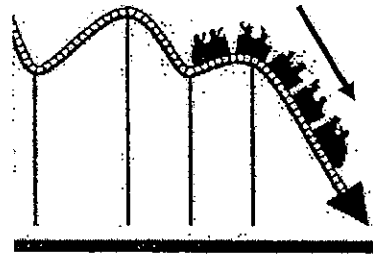
K



L



M



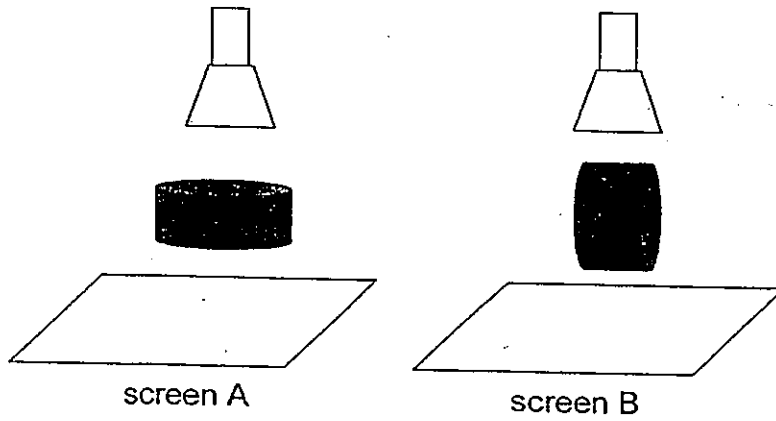
N

Which activities involve an increase in gravitational potential energy?

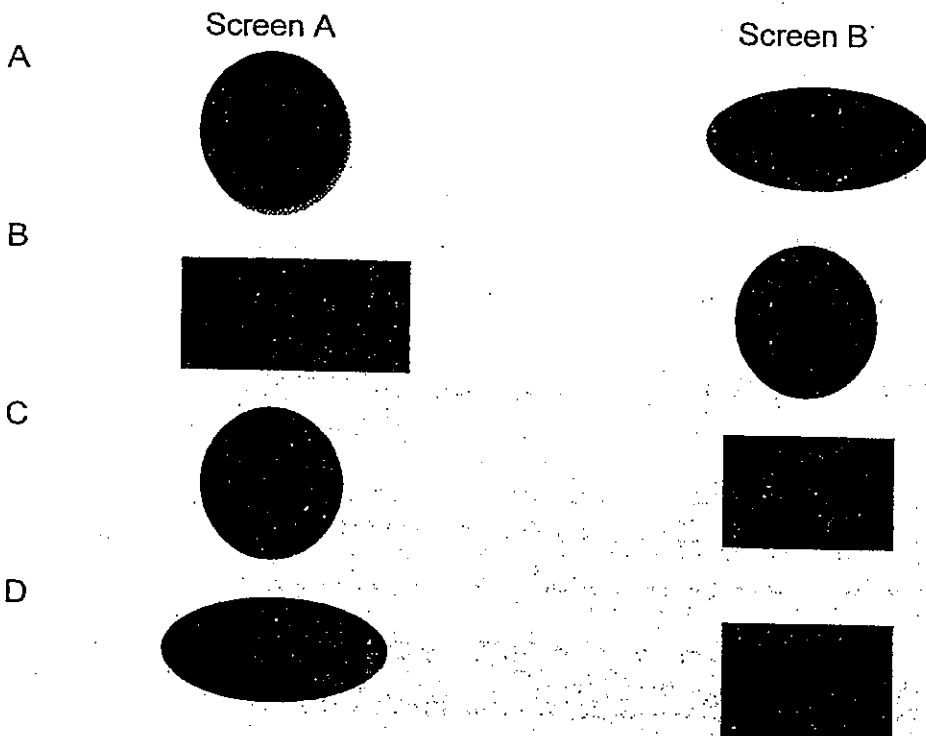
- (1) K and L only
- (3) L and M only

- (2) K and N only
- (4) M and N only

- 27 Jun Ming wanted to study the shadows formed by 2 identical objects. The objects were placed in different positions directly under identical light sources in a dark room. Shadows were formed on screens A and B as shown below.



Which of the following are possible shadows that could have been observed on each screen?



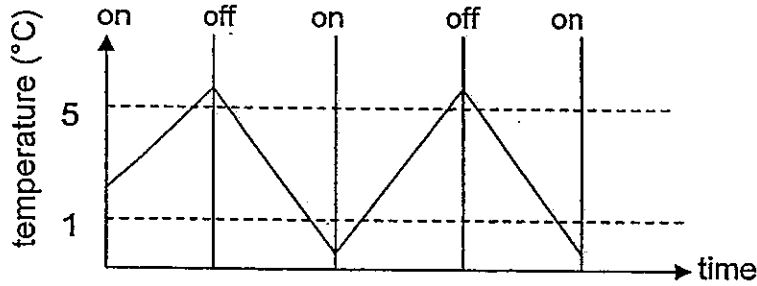
- (1) A and B only                      (2) A and C only  
 (3) B and D only                      (4) C and D only



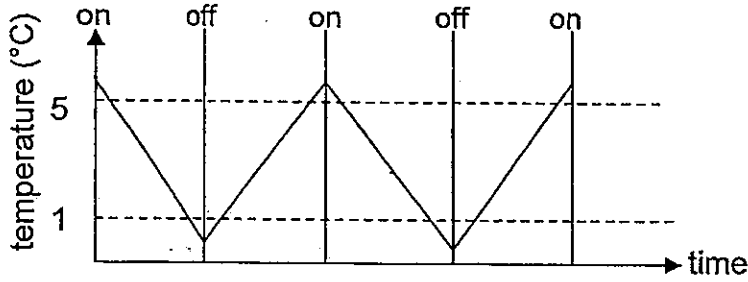
30 A special switch called a thermostat is used in a refrigerator to control its temperature. It turns on the cooling system in the refrigerator when the temperature rises above  $5^{\circ}\text{C}$  and turns off the system when the temperature falls below  $1^{\circ}\text{C}$ . The following test is carried out when the refrigerator is first switched on.

Which one of the following graphs shows how the temperature in the refrigerator changes over time?

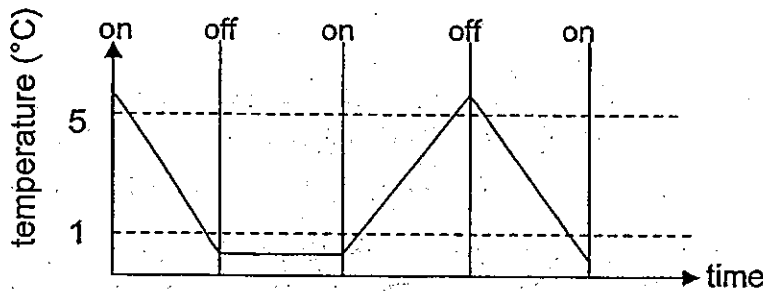
(1)



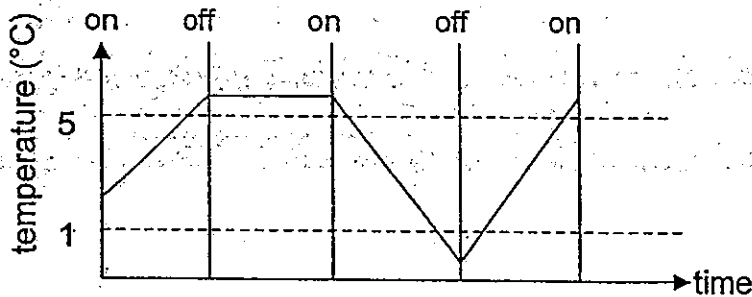
(2)



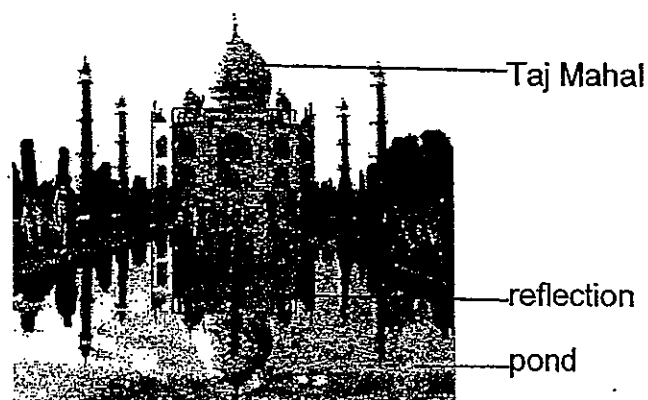
(3)



(4)



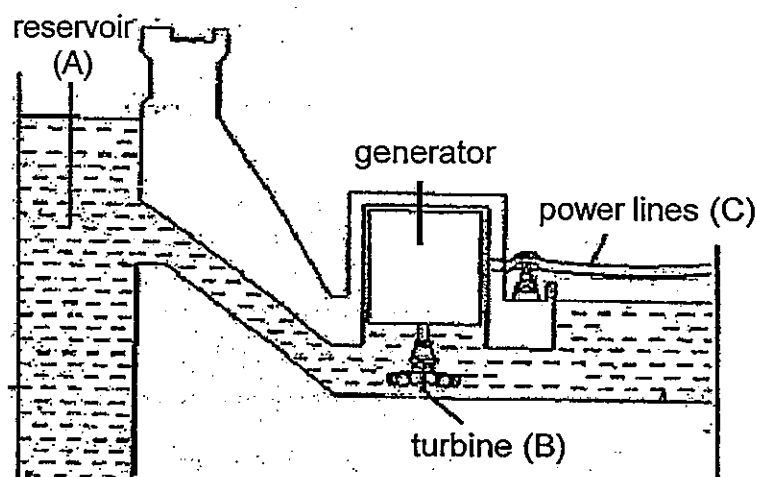
28 The image below shows the Taj Mahal and its reflection in the pond.



Which of the following statements explains how the reflection on the pond can be seen?

- (1) The pond reflects the shadow of the Taj Mahal to our eyes.
- (2) Taj Mahal gives out light which was reflected into our eyes.
- (3) The pond reflected light onto the Taj Mahal and the light was reflected into our eyes.
- (4) The Taj Mahal reflected light onto the pond and the light was reflected into our eyes.

29 The diagram below shows a hydroelectric power station.



Which of the following shows the forms of energy at positions A, B and C?

	A	B	C
(1)	Gravitational Potential Energy	Kinetic Energy	Electrical Energy
(2)	Kinetic Energy	Electrical Energy	Electrical Energy
(3)	Chemical Potential Energy	Electrical Energy	Gravitational Potential Energy
(4)	Gravitational Potential Energy	Kinetic Energy	Chemical Potential Energy

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**SEMESTRAL ASSESSMENT 1  
2013**

**BOOKLET B**

**Date : 14 May 2013**

**Duration : 1 h 45 min**

**Name : \_\_\_\_\_ (     )**

**Class: Primary 6 (     )**

**Marks Scored:**

<b>Booklet A:</b>		<b>60</b>
<b>Booklet B :</b>		<b>40</b>
<b>Total :</b>		<b>100</b>

**Any query on marks awarded should be raised by 22 May 2013. We seek your understanding in this matter as any delay in the confirmation of marks will lead to delays in the generation of results.**

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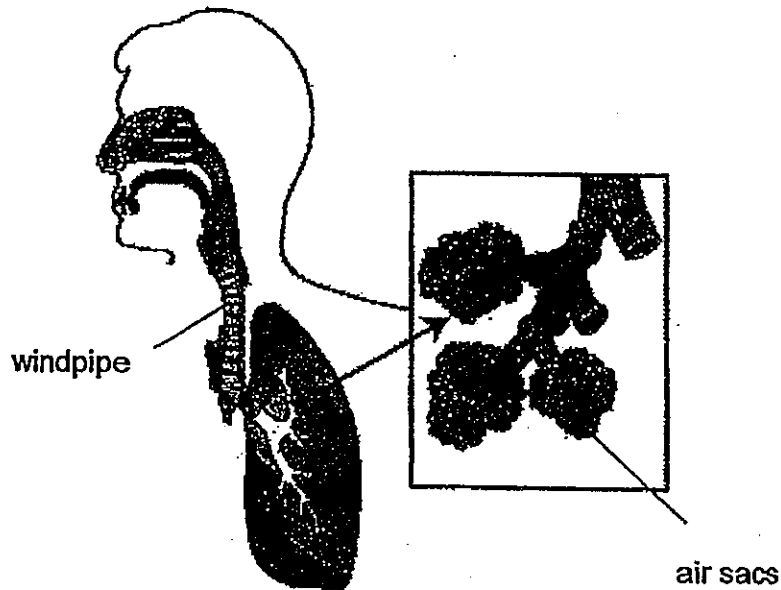
**DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.  
FOLLOW ALL INSTRUCTIONS CAREFULLY.**

**Booklet B consists of 17 printed pages including this cover page.**

**Section B (40 marks)**

Write your answers to questions 31 to 44 in the spaces provided.  
Marks will be deducted for misspelt key words.

31. The diagram below shows parts of a human respiratory system.



The windpipe branches into 2 air tubes in the lungs which further divide into many similar tubes that end in numerous air sacs.

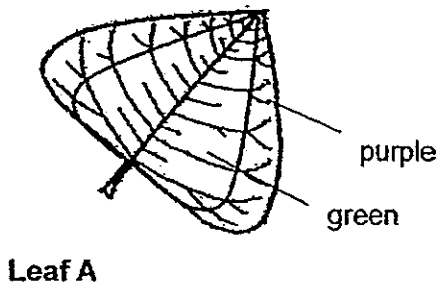
Explain how having so many of these tiny air sacs affects gaseous exchange in the human body. [2]

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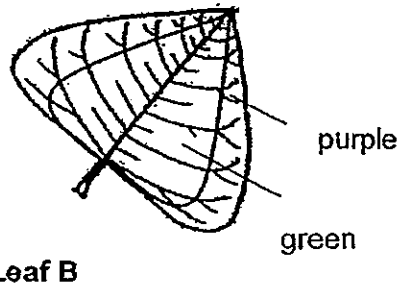
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32. The diagrams below show two leaves, A and B.



**Leaf A**

Leaf A was plucked from a plant which had been left in a cupboard for 2 days.



**Leaf B**

Leaf B was plucked from a plant which had been left in a brightly-lit room for 2 days.

Immediately after plucking, the colours of these leaves were first removed by boiling the leaves and soaking them in alcohol. Then, they were tested for the presence of starch using iodine solution. Iodine, a yellow-coloured solution, turns dark blue when it comes into contact with starch.

(a) Name the part in a leaf cell which enables it to make food. [1]

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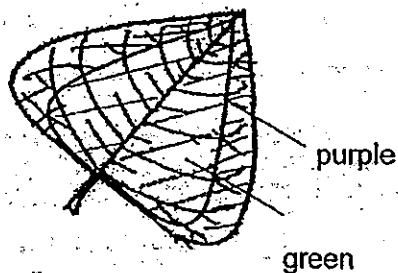
(b) A few drops of iodine were added to leaf A, the iodine remained yellow. Explain this observation. [1]

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(c)i) Shade the part(s) of leaf B that will turn iodine dark blue. [1]



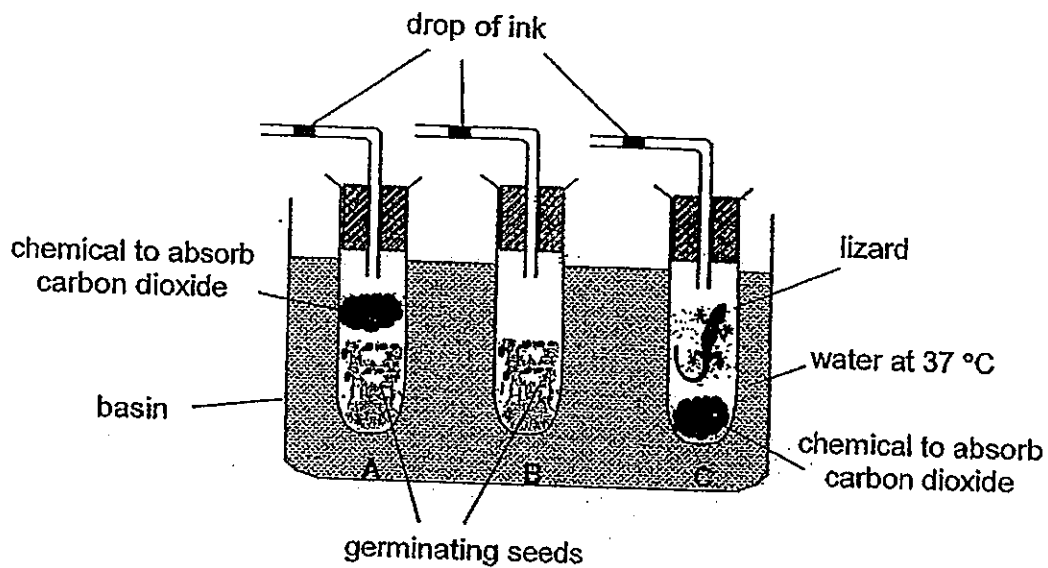
(c)ii) Explain your answer for (i). [1]

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33. Mrs Lee set up an experiment using some germinating seeds and a lizard, 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.



It was observed that when the tubes were first placed into the basin of warm water, all the 3 ink drops moved away from the test tubes immediately.

(a)

Explain this observation.

[1]

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(b)

Three days later, the ink drops moved towards the test tubes in tubes A and C. Explain the observation for each tube.

[2]

Tube A:

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Tube C:

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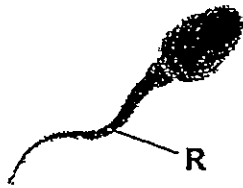


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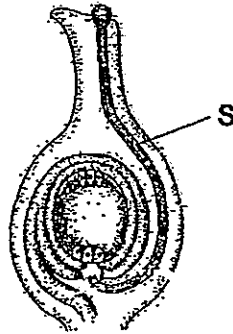


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34. P and Q show the structures (not drawn to scale), produced by the male reproductive organs of an animal and a plant respectively.



P ( animal )



Q (Plant)

- (a) Complete the table below with the correct information about the structures shown in the diagrams. [1]

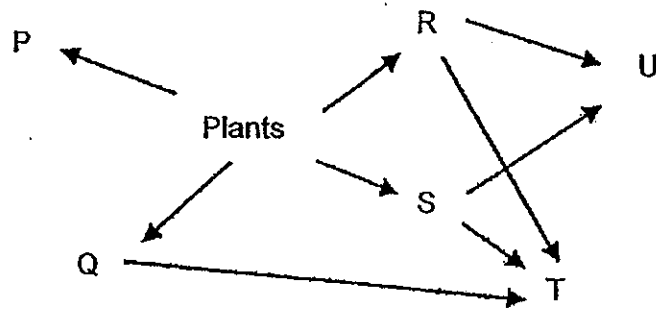
Structure	Name of Structure	Male organ which produces the structures
P	(i)	testes
Q	pollen	(ii)

- (b) Part R is a tail and part S is the pollen tube. Explain how parts R and S enable reproduction to take place in each of these organisms. [2]

(i) R: \_\_\_\_\_  
 \_\_\_\_\_

(ii) S: \_\_\_\_\_  
 \_\_\_\_\_

35. The food web below shows six types of animals, P, Q, R, S, T and U, in a particular community.



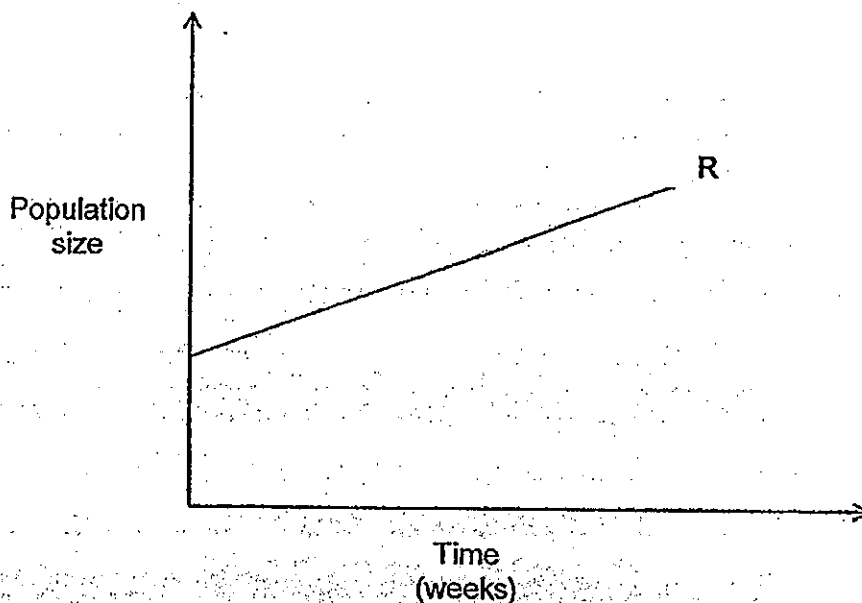
- (a) What will likely happen to the population of P when there is a disease that wiped out only the population of T in the habitat? Explain your answer. [2]

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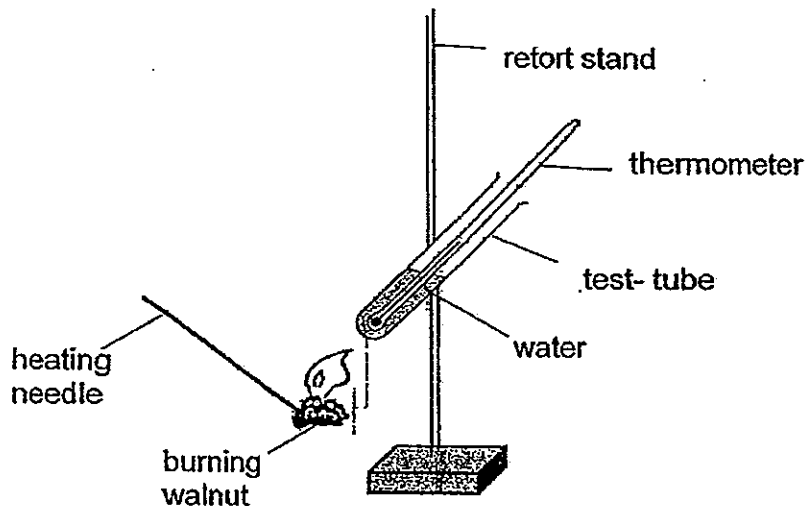
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- (b) In the graph provided below, complete the graph by drawing and labeling a line graph which best represents how the population of U is likely to be affected when the entire population of T was removed from the habitat. The graph showing how population R would be affected has been drawn for you. [1]





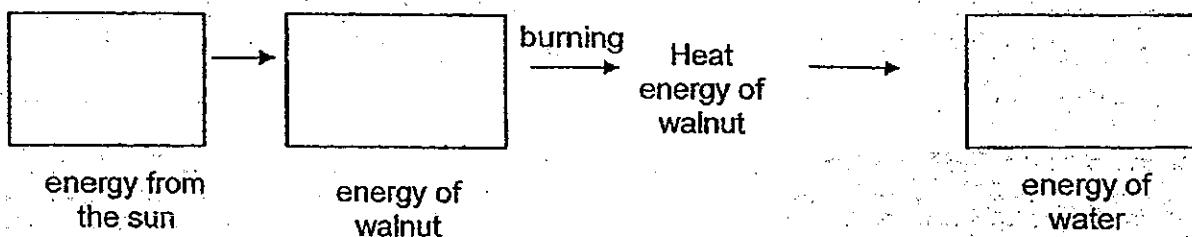
36. The diagram below shows the set-up of a test that could be used to find out the amount of energy released when food, such as the walnut is burnt.



**Procedure of the test**

- Record the temperature of the water in the test tube.
- Use a heating needle to hold a walnut in a strong flame until it catches fire.
- Place the burning walnut immediately beneath the large test tube until the flame goes out.
- Record the temperature of the heated water

- (a) State the energy conversion that takes place from the sun to the walnut and lastly to the water in the above test. [1]



- (b) The set-up was used to test 3 types of food, A, B and C. The data obtained is shown below.

Food	Temperature of water (°C)	
	Before heating	After heating
A	25	32
B	25	40
C	25	34

Using only the data shown above, which food, A, B or C must be consumed in the largest quantity to obtain as much energy as the others? Explain why. [2]

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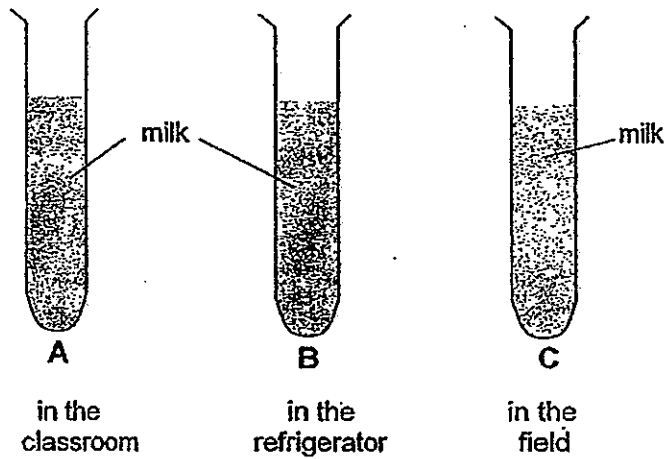
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- (c) Explain how the distance between the burning food and the test tube affects the result of the experiment. [1]

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37. Pei Pei carried out an experiment as shown below.



She put the same amount of milk in each of the test tubes and left them at different places. After a few days, she noticed that the milk in test tubes A and C had turned bad.

(a) Name the organism that could have caused this change in the milk. [1]

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(b) Name and explain the process that had caused this change in the milk. [1]

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(c) Explain why this process did not happen in test tube B. [1]

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38. Judy placed 3 aquatic organisms, P, Q and R, in an aquarium and recorded the number of each type of organism in the table below. The conditions in the aquarium were favourable to the survival of all the 3 organisms. The number of each organism present after 1 week was recorded in the table below.

Then, she added some organism X into the aquarium. After 1 week, she observed that there were fewer organism X in the aquarium and also noted the change in the population of the other organisms.

	P	Q	R
Number of organisms at the beginning	10	20	10
Number of organisms before Organism X was put into the aquarium	10	20	10
Number of organisms after Organisms X was put into the aquarium	10	10	15

- (a) Based on the information provided in the table above, describe the food relationship among organisms X, Q and R.

[1]

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- (b) When Judy removed all of Organism P from the aquarium, she noticed that organism X, Q and R started to swim near the surface of the water.

What could Organism P most likely be? Give a reason for your answer.

[2]

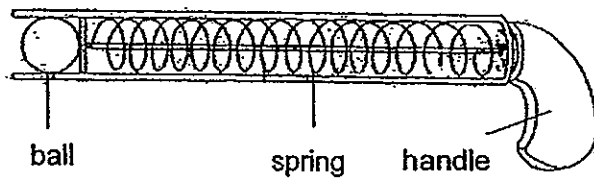
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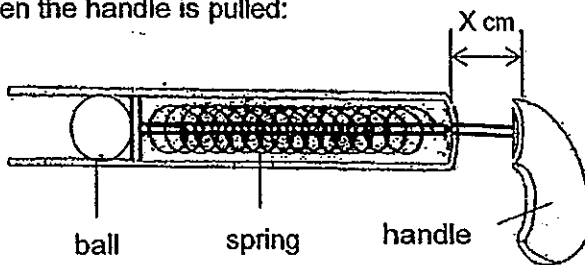
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39. The diagrams below show a popgun that works using a spring. When the handle is pulled back at a distance of 'X' cm and released, the ball will shoot out of the popgun.

When the handle is not pulled:



When the handle is pulled:



The table below shows the distance travelled by the ball when the handle is pulled back at different lengths.

Length of X (cm)	Distance travelled by the ball (cm)
2	6
5	12
8	18
11	24
14	29
17	35
17	35

- (a) Describe the relationship between the length of 'X' and the distance travelled by the ball.

[1]

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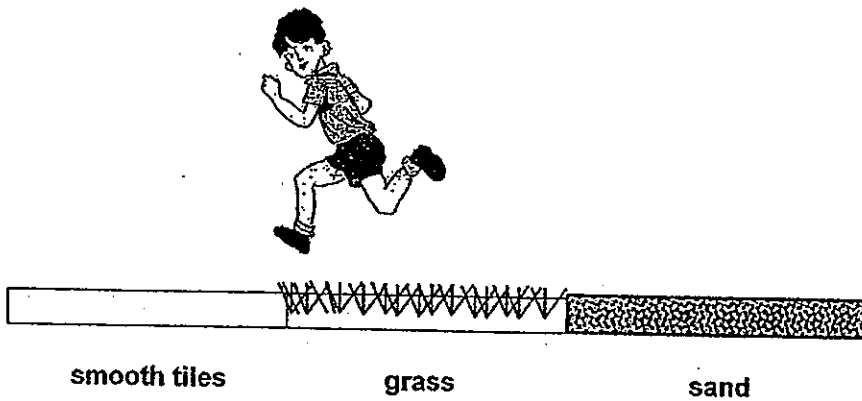
(b) Name the force that enables the ball to shoot out of the popgun. [1]

\_\_\_\_\_

(c) Explain why length of X cannot be greater than 17cm. [1]

\_\_\_\_\_  
\_\_\_\_\_

40. Jack ran along a path on a rainy day as shown in the diagram below.



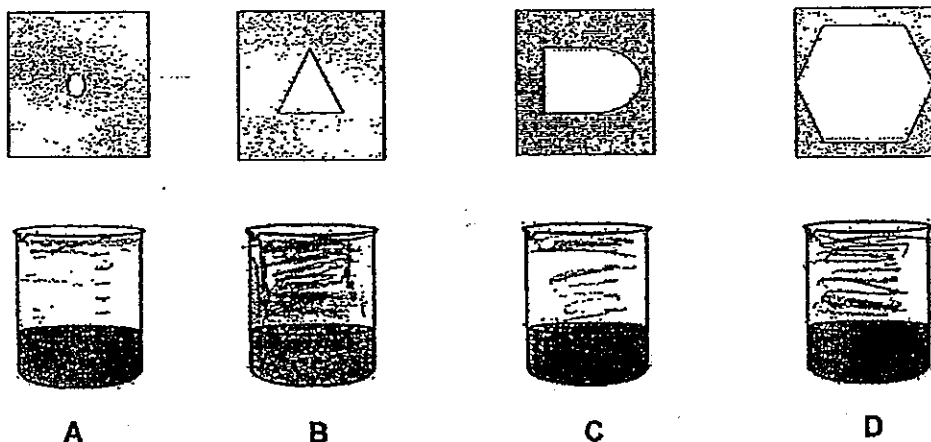
(i) On which part of the path is Jack most likely to fall? [1]

\_\_\_\_\_

(ii) Give a reason for your answer. [1]

\_\_\_\_\_  
\_\_\_\_\_

41. Fiona wanted to confirm her hypothesis that the rate of evaporation of water is higher when the exposed surface area is bigger. She filled four beakers, A, B, C and D as shown in the diagram, with equal volume of water, and covered the beakers with the cards she had prepared. Different shapes had been cut out from the cards as shown. She placed three of the beakers on a table in the science room and another one at the balcony.



Two days later, she measured the volume of water left in each beaker using a measuring cylinder. The readings are shown in the table below.

Volume of water (ml)				
	Beaker A	Beaker B	Beaker C	Beaker D
Day 1	100	100	100	100
Day 2	85	65	71	57

Her father told her that she had not carried out a fair test as she must keep the location of all the beakers the same.

- (a) Based on the results above, which beaker was most likely left at the balcony? [2]  
Explain your answer.

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- (b) State two other factors that could affect the rate of evaporation. [1]

Factor 1: \_\_\_\_\_

Factor 2: \_\_\_\_\_

42. Four flasks were filled with different liquids, A, B, C and D and placed into a basin of water at room temperature as shown in figure 1 below. The liquid in each flask was adjusted to the same level.

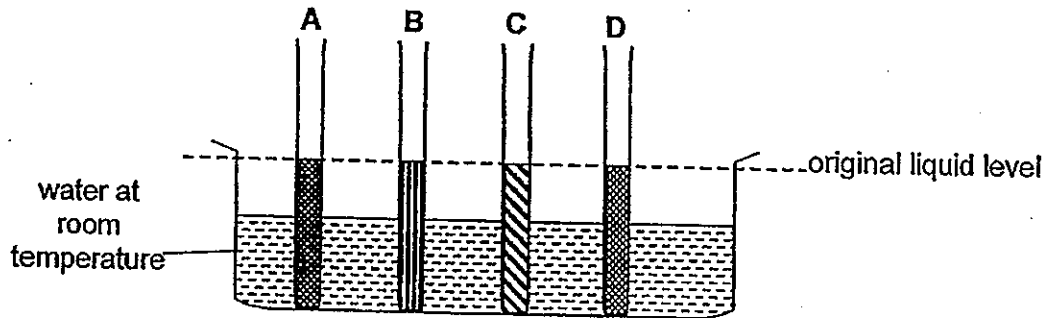


Figure 1

The four flasks were then placed into another basin filled with hot water. After 5 mins, the liquid levels in each flask rose, as shown in the figure 2.

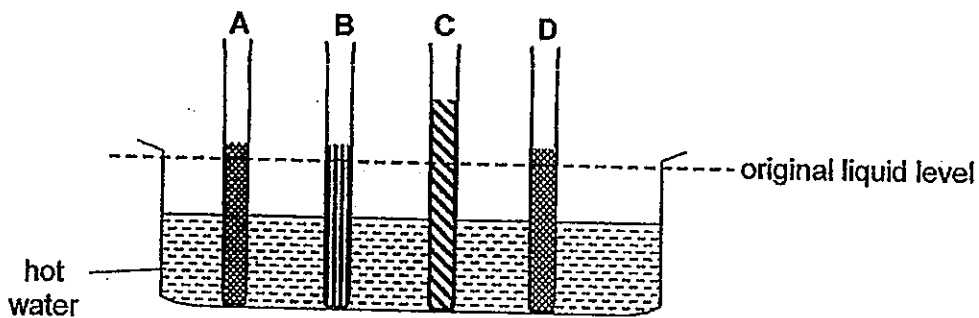


Figure 2

- (a) State the aim of the experiment.

[1]

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- (b) Which of the liquids, A, B, C or D, is the most suitable to be used to fill a laboratory thermometer? Explain your answer.

[1]

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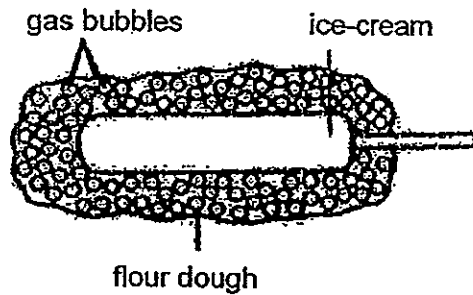
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43. The diagram below shows a fried ice cream.



Flour is mixed with substance X and water to make a special dough. The ice cream is then dipped into this special dough before being fried in hot oil. The special dough will produce gas bubbles when it interacts with hot oil.

Explain why the ice cream did not melt in the hot oil during deep frying.

[2]

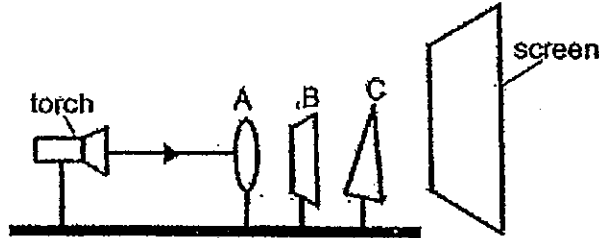
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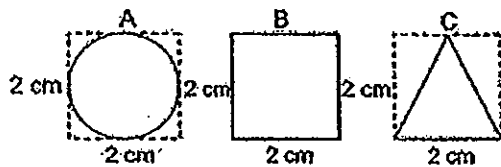
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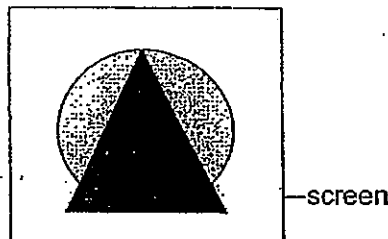
44. The diagram below shows three objects, A, B and C, each made of a different material placed between a torch and a screen in a room.



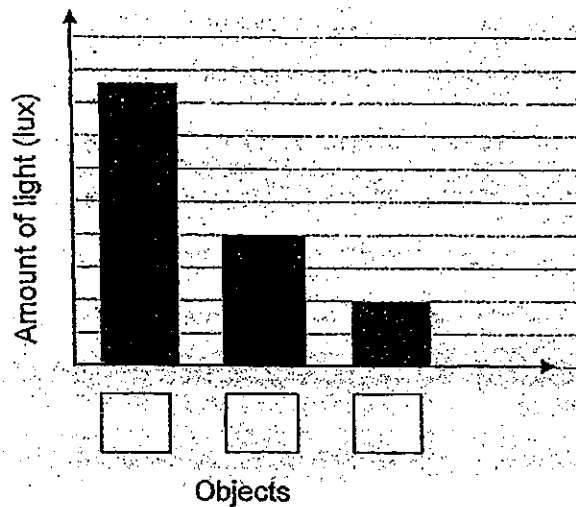
The dimensions of the three objects are given below.



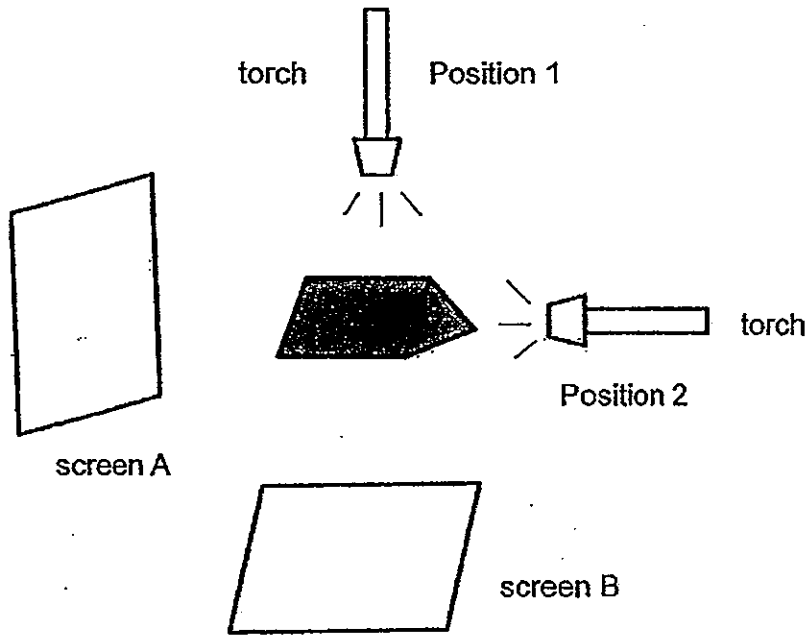
Mr Tan turned on the torch and observed the shadows that the different objects formed on the screen. The shadows appeared as shown below.



- (a) Mr Tan used a datalogger to measure the amount of light passing through each of these objects individually. Based on the images formed on the screen above, identify the graphs which represent the light that passed through each object. Write the letters representing the objects in the boxes below. [1]

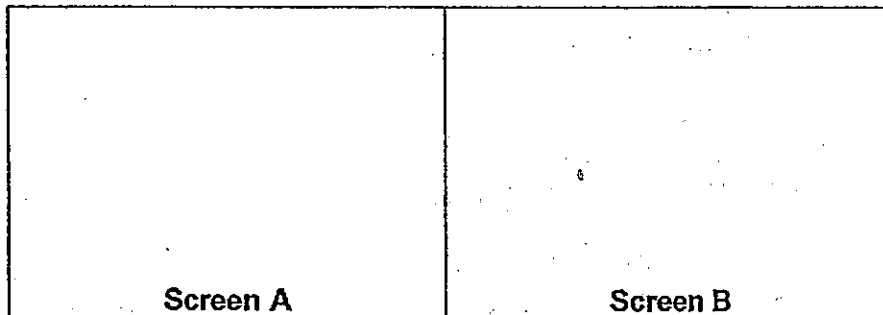


- (b) Shirley shone a torch on an object made of opaque material from two different positions as shown in the diagram below. The shadows were cast on two screens, A and B.



- (i) Draw the shape of the shadows formed on the two screens, A and B, respectively.

[1]



- (ii) Shirley noticed that the shadows formed on both the screens were very small. Suggest how she could make the shadows appear bigger.

[1]

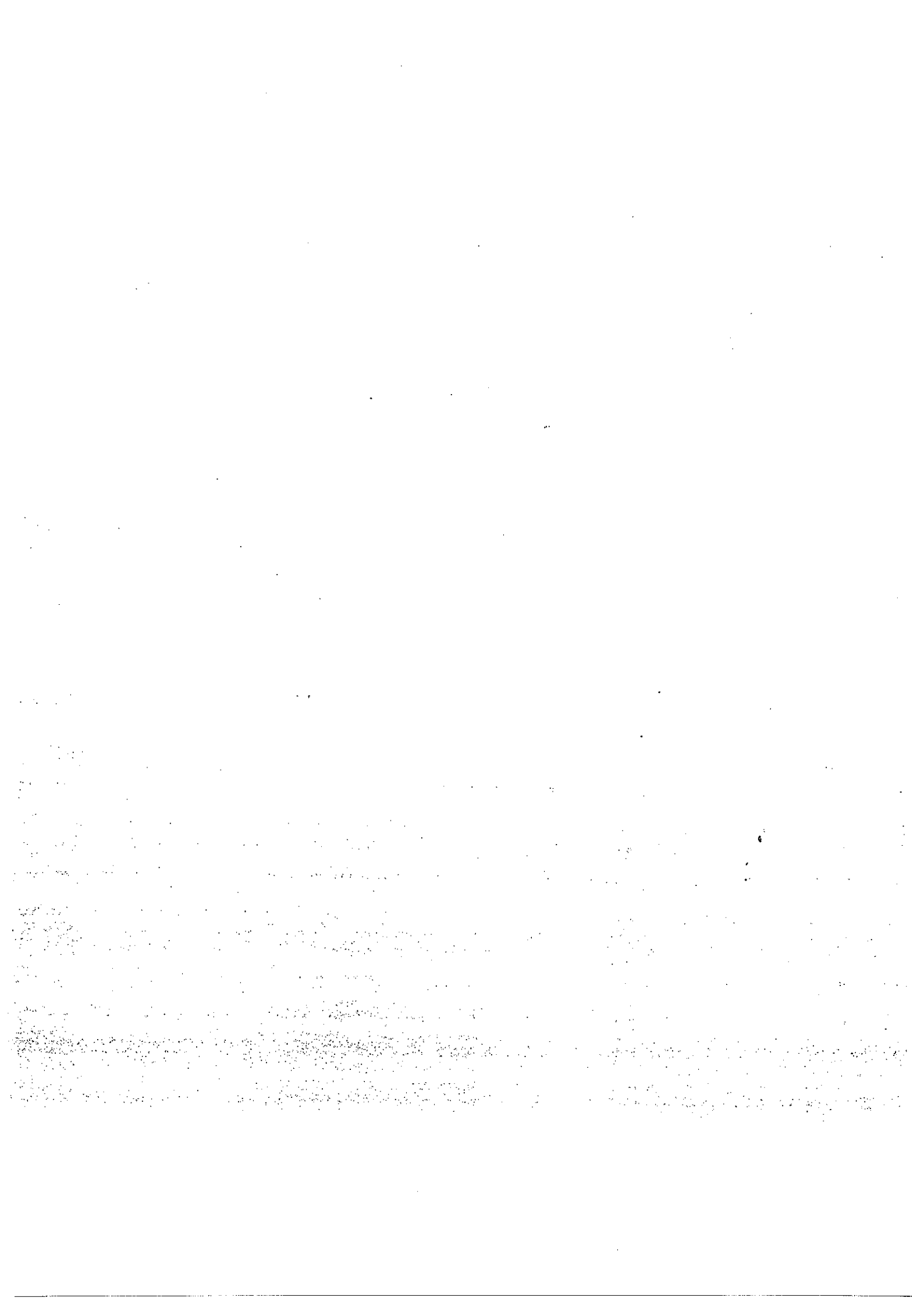
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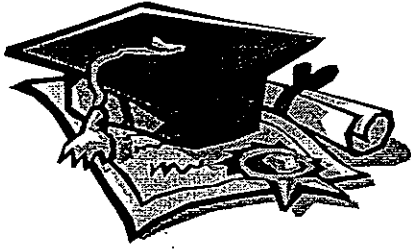


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# ANSWER SHEET

**EXAM PAPER 2013**

**SCHOOL : NANYANG**

**SUBJECT : PRIMARY 6 SCIENCE**

**TERM : SA1**

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

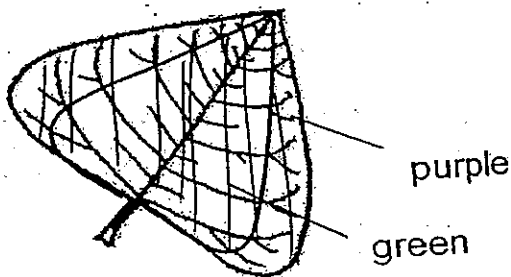
Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
4	3	2	4	3	1	2	2	3	4	4	1	2

31) It increases the exposed surface area of the air sacs and the amount of oxygen taken in is increased.

32)a) Chloroplasts.

b) As leaf A was placed in cupboard, where there is no light, it could not photosynthesis and thus, leaf A will not make glucose, which is stored as starch.

c)i)



ii) The chlorophyll is a green pigment that traps sunlight to make food.

33)a)The water heat the air, which then expanded and pushed the ink drop away.

b)A: Germinating seeds take in oxygen and give out carbon dioxide than the chemical absorbs the carbon dioxide resulting in a decrease of air.

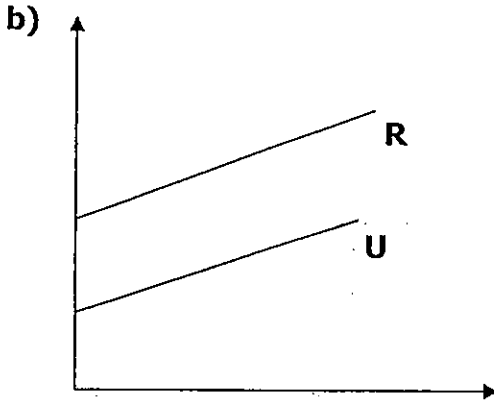
C: The lizard took in oxygen and give out carbon dioxide then the chemical absorbs the carbon dioxide resulting in a decrease of air.

34)a)i)sperm ii)anther

b)i)It enables the sperm to move to the egg.

ii)It allow male cells to travel to the ovary.

35)a)The population Q, R, S will increase, plant population will decrease and P will have lesser plants to feed on.



36)a)Light energy→Chemical energy→Heat energy

b)A. Since temperature of water increased the least, it gives off the leas amount of energy.

Or) Since the temperature of water increased the least, it has lesser chemical potential energy to be converted to heat energy.

c)Distance between the burning food and tube will affect the temperature of water.

37)a)Bacteria.

b)Decomposition. The bacteria broke down the milk, causing it to go bad.

c)Test tube B is left in the refrigerator, temperature is too low for the bacteria.

38)a)X eats Q but gets eaten by R.

b)When P is removed, no photosynthesis is available, thus, organism swim nearer to the water surface to take in more dissolved oxygen.

39)a)As the length of 'X' increases the distance travelled by the ball increases.

b)Elastic spring force.

c)The spring has already been compressed to its fullest length.

40)i)Smooth tiles.

ii)Smooth tiles has the least friction between Jack's shoes and the smooth adding water makes the smooth tiles even smoother.

41)a)Beaker B. It had a smaller exposed surfaced compared to C but still managed to have less water left after the experiment.

b)1: Humidity.

2: Wind.

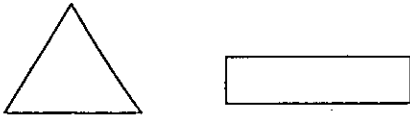
42)a)To find out which liquid expands the most when heated.

b)C. It was the most sensitive to the temperature.

43)Air bubbles are poor conductors of heat and prevented ice cream gaining heat quickly.

44)a)B A C

b)i)



ii)She could decrease the distance between the torch and the object.

