

Index No.

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**NAN HUA PRIMARY SCHOOL
PRELIMINARY EXAMINATION – 2013
PRIMARY 6**

SCIENCE

BOOKLET A

30 Multiple Choice Questions (60 marks)

Total Time for Booklets A and B : 1 hour 45 minutes

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the space provided.
2. Do not turn over the page until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Shade your answers in the Optical Answer Sheet (OAS) provided.

Booklet A		/ 60
Booklet B		/ 40
Total		/100

Name: _____ () Class: P 6 _____

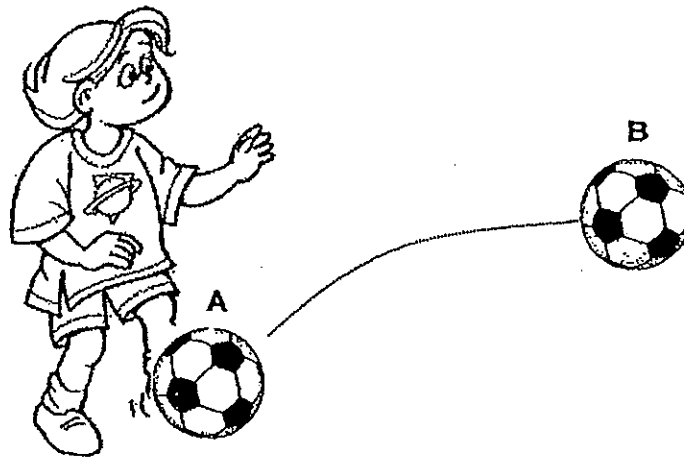
Date: 29 August 2013

Parent's Signature: _____

Section A: (20 x 2marks = 40marks)

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.

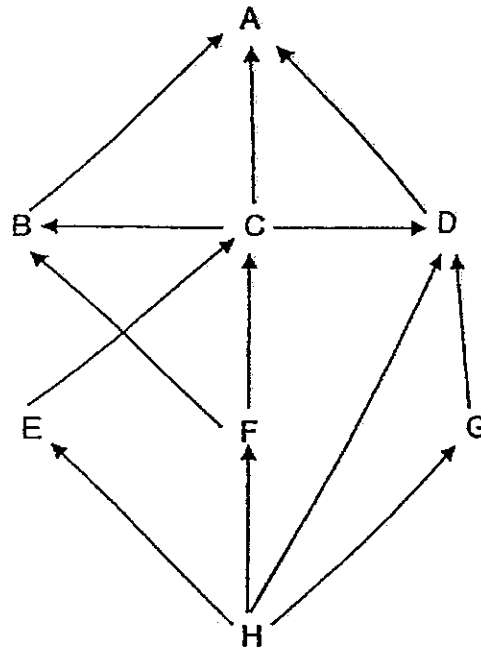
1. Jenny kicked a ball from A to B as shown below.



Which one of the following statements is **NOT** correct?

- (1) The potential energy of the ball increased from A to B.
- (2) The force exerted by Jenny changed the direction of the ball.
- (3) The kinetic energy of the ball remained the same from A to B.
- (4) The gravitational force acting on the ball remained the same from A to B.

2. The diagram below shows a food web in a certain habitat.



The mouth part of animal C is shown below.



Which other animal in this food web has a similar teeth structure?

- (1) Animal A
- (2) Animal D
- (3) Animal F
- (4) Animal G

3. Animal P is a nocturnal animal which lives in burrows during the day and emerges at night to feed. It has big ears and thick padded feet. It produces concentrated urine that has very little water.

Which habitat will animal P mostly be found?

- (1) Arctic
- (2) Desert
- (3) Seashore
- (4) Mangrove swamp

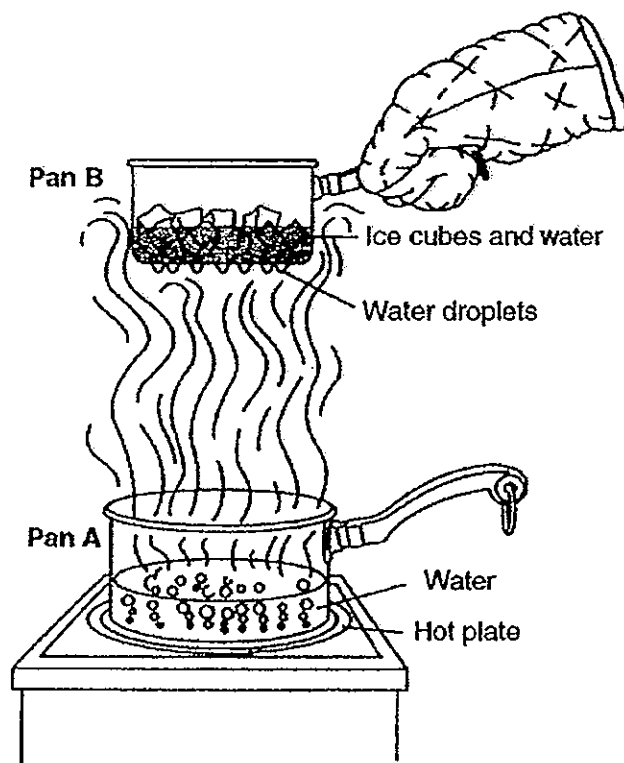
4. The table below shows the trend of human population and carbon dioxide levels in the atmosphere over time.

Human Population and Carbon Dioxide Levels		
Year	Human Population (billions)	Carbon Dioxide Levels in the Atmosphere (parts per million)
1960	2.50	317
1970	2.75	325
1980	3.00	337
1990	5.00	342

Which human activity might explain the change in carbon dioxide levels shown in the table above?

- (1) Using solar energy.
- (2) Burning fossil fuels.
- (3) Recycling useful materials.
- (4) Using hydroelectric energy.

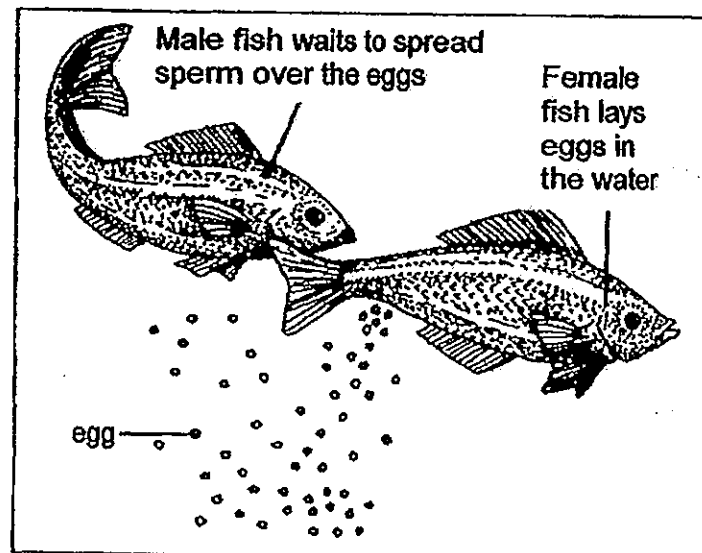
5. The diagram below shows an activity performed by a student in a laboratory.



Which of the following best shows the processes occurring at the different locations?

	Pan A			Pan B		
	Boiling	Condensation	Freezing	Melting	Condensation	Evaporation
(1)	✓					✓
(2)	✓			✓	✓	
(3)			✓		✓	
(4)		✓		✓		✓

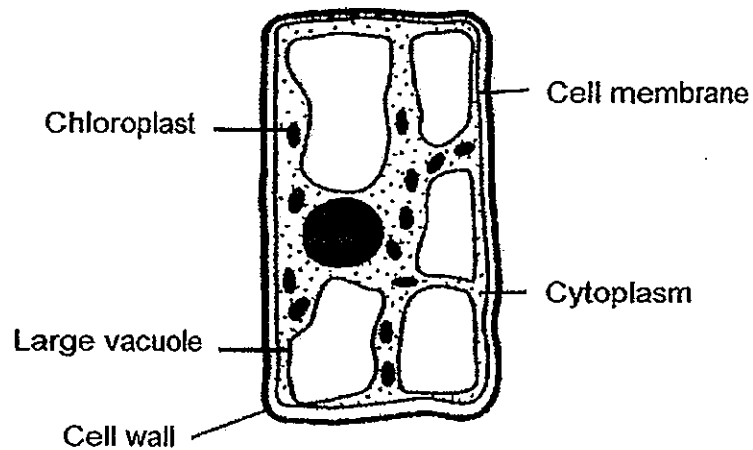
6. The diagram below shows the fertilisation process of fish P.



In what way(s) is/are the process different from that of a human?

- A Many eggs are released at a time.
 - B The process takes place outside the female body.
 - C The sperm cell must fuse with the egg cell for fertilisation to take place.
- (1) A only
 - (2) A and B only
 - (3) B and C only
 - (4) A, B and C

7. The diagram below shows an enlarged view of a cell. After examining the diagram, four pupils came to a different conclusion listed below.

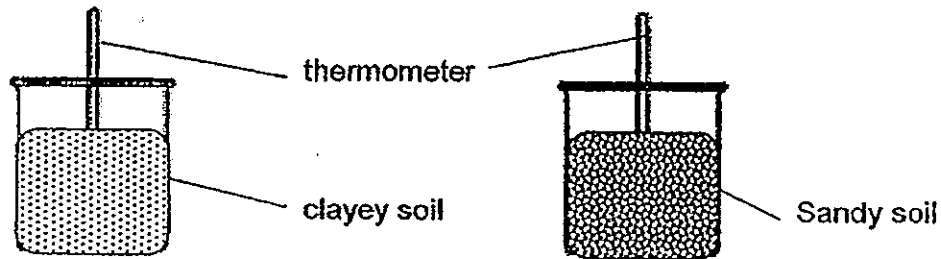


- Ada The cell is a plant cell as it has a cell membrane.
Ben The cell is not an animal cell as it has a cell wall.
Cze The cell is an animal cell as all animal cells have cytoplasm.
Dan The cell is a plant cell as it has a cell wall and large vacuoles.

Who has made a correct conclusion?

- | | |
|----------------------|----------------------|
| (1) Cze only | (2) Dan only |
| (3) Ada and Ben only | (4) Ben and Dan only |

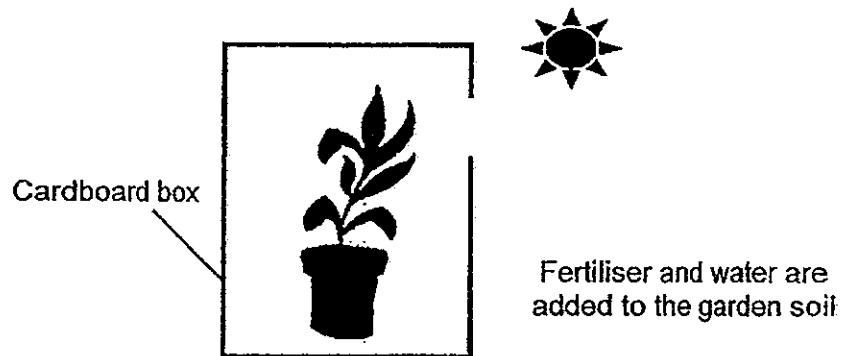
8. Aishah wanted to find out if clayey soil or sandy soil heats up more quickly. She put the two set-ups shown below in the sun and recorded the time taken for the temperature of each soil to reach 40°C.



Which of the following variables must she keep the same to ensure a fair test?

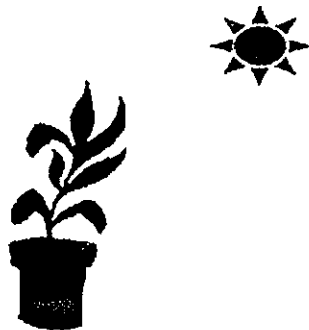
- A The amount of soil.
 - B The type of container.
 - C The size of the soil particles.
 - D The time taken for the soil to heat up.
- (1) A and B only (2) A and C only
- (3) B and D only (4) A, B and D only

9. Derek wanted to find out if plants grow towards sunlight. He placed a plant in a cardboard box with a small opening near the window. He left the setup in the open for a week.



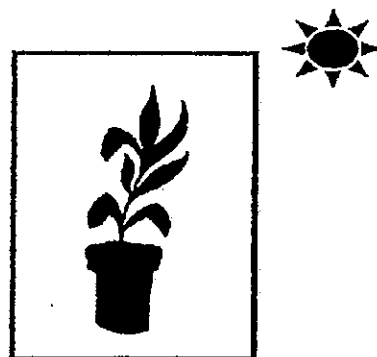
Which one of the following set-ups should be used as a control for the experiment?

(1)



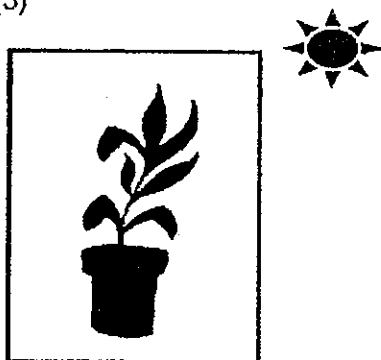
Fertiliser and water are added to the garden soil

(2)



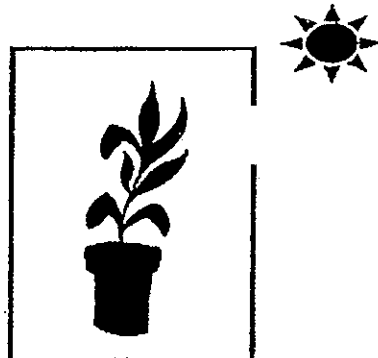
Fertiliser and water are added to the clayey soil

(3)



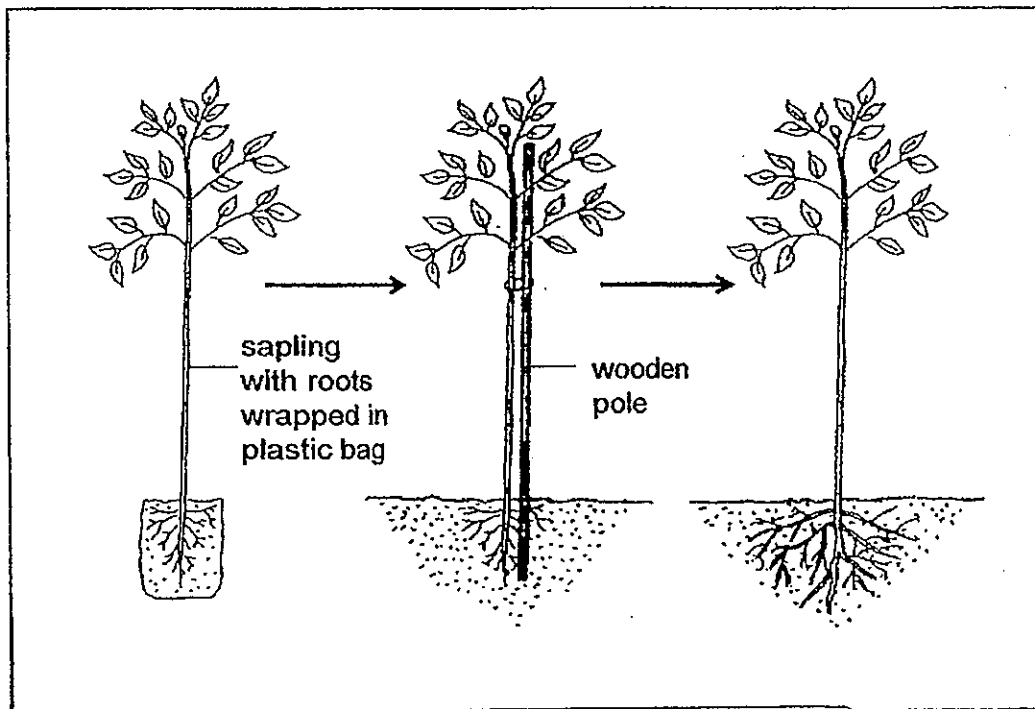
Fertiliser and water are added to the garden soil

(4)



Fertiliser and water are added to the clayey soil

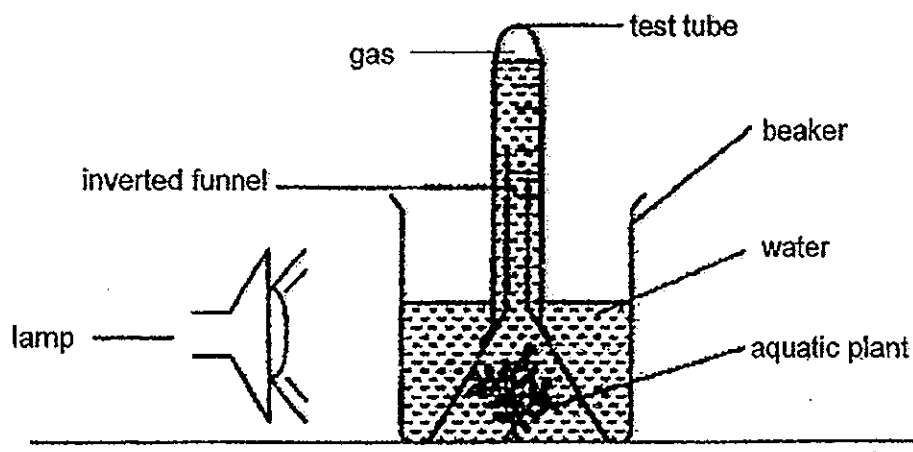
10. The diagrams below show the development of a sapling that was planted by some workers from National Parks Board.



Why does the sapling need to be supported by the wooden pole immediately after the sapling was transplanted from the plastic bag to the garden?

- (1) It has a non-woody stem.
- (2) It has not grown enough leaves to make its own food.
- (3) Its roots are unable to anchor it firmly to the ground yet.
- (4) The pole helps to transport more water to the leaves for photosynthesis.

11. Jane set up an experiment in a dark room as shown below.

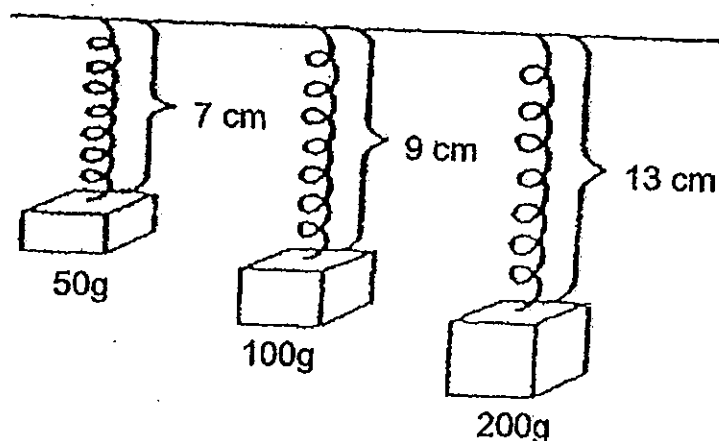


She placed a lamp at a distance of 20 cm from the beaker. After one hour, she observed that the test tube had collected 5 cm³ of gas. She repeated the experiment by placing the lamp at different distances from the beaker.

Which one of the following shows the most likely result of this experiment?

	Distance from lamp (cm)	Gas collected	Volume of gas
(1)	10	Oxygen	Less than 5 cm ³
(2)	10	Carbon Dioxide	Less than 5 cm ³
(3)	30	Oxygen	Less than 5 cm ³
(4)	30	Carbon Dioxide	Less than 5 cm ³

12. Xiao Wei conducted an experiment using a spring balance. Its original length was 5 cm. Different weights were added and the lengths of the spring were measured, as shown in the diagram below.



Based on the data recorded, what would be the extension of the spring when the load was 175 g?

- (1) 5 cm
 - (2) 7 cm
 - (3) 11 cm
 - (4) 12 cm
13. Electrical energy is converted to kinetic, heat and sound energy in many electrical devices. Some machines that convert electrical energy to kinetic energy were tested for fuel efficiency. The results of the test are shown in the table below.

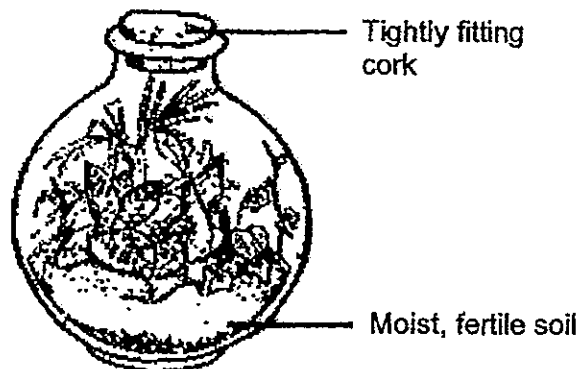
Test of Fuel Efficiency

Machine	Units of Electrical Energy Consumed	Equivalent units of Kinetic Energy Produced
A	120	100
B	130	100
C	160	80
D	160	100

Which machine produced the most amount of heat and sound energy?

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

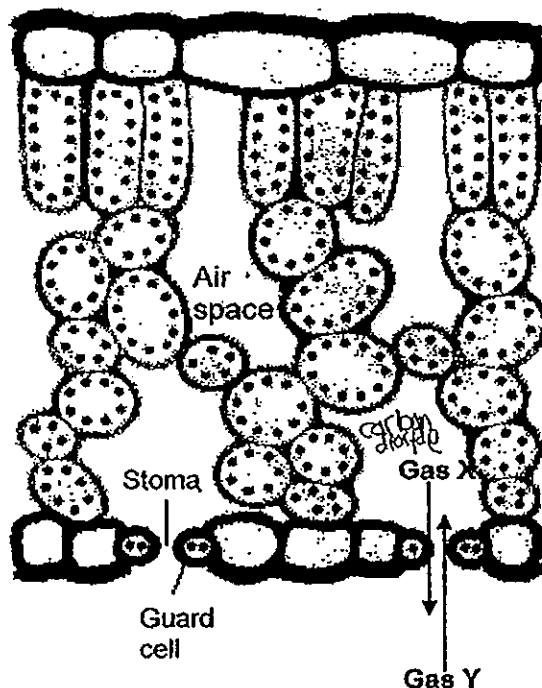
14. The diagram below shows a bottle garden. The plants are able to survive in the closed environment for a long time.



Which of the following statements is/are true?

- A The plants are carrying out respiration all the time.
 - B The plants can carry out photosynthesis all the time.
 - C A continuous water cycle can take place in the bottle.
- (1) A only
 - (2) A and C only
 - (3) B and C only
 - (4) A, B and C

15. The diagram below shows the exchange of gases between the leaf and its surroundings in the absence of light. Gas X in the leaf is exchanged for gas Y in the surrounding air.



Based on the information above, which of the following statements about the movement of Gas X and Gas Y in human is/are correct?

- A Gas Y from the bloodstream enters our leg cells.
 - B Gas X is absorbed into the bloodstream at the brain.
 - C Gas X in the lungs is absorbed into the bloodstream and transported to the heart.
- (1) B only
(2) C only
(3) A and B only
(4) A, B and C

16. The table below shows the breathing methods of three aquatic animals D, E and F found in a pond habitat.

Method of breathing	Trap an air bubble	Breathing tube	Gills
Organism	D	E	F

Which animal(s) is/are **unlikely** to catch preys at the bottom of the pond?

- (1) Animal D
 - (2) Animal E
 - (3) Animals D and E
 - (4) Animals D, E and F
17. Bird Y generally hunts by perching quietly on a tree branch and keeping a close look out of the surroundings for potential preys in the water. Once it spots a prey, it swoops down and seizes it between its bills and then return to the same perch to enjoy its catch.

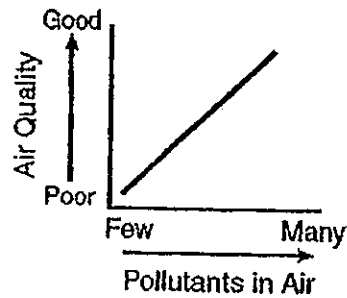
The diagrams below show some bills and feet of birds.

A		D	
B		E	
C		F	

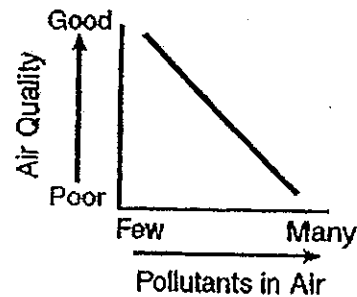
Which one of the following correctly identifies the bill and foot of bird Y?

	Bill	Foot
(1)	A	E
(2)	A	F
(3)	B	D
(4)	C	E

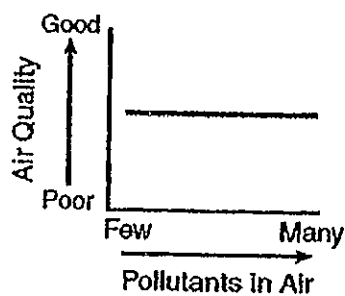
18. Which graph best represents the relationship between the amount of pollutants in the air and the quality of the air?



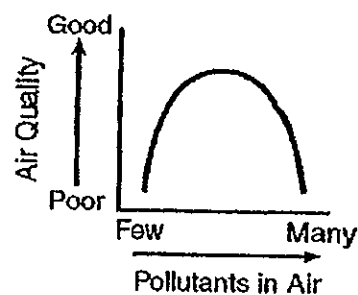
(1)



(2)



(3)



(4)

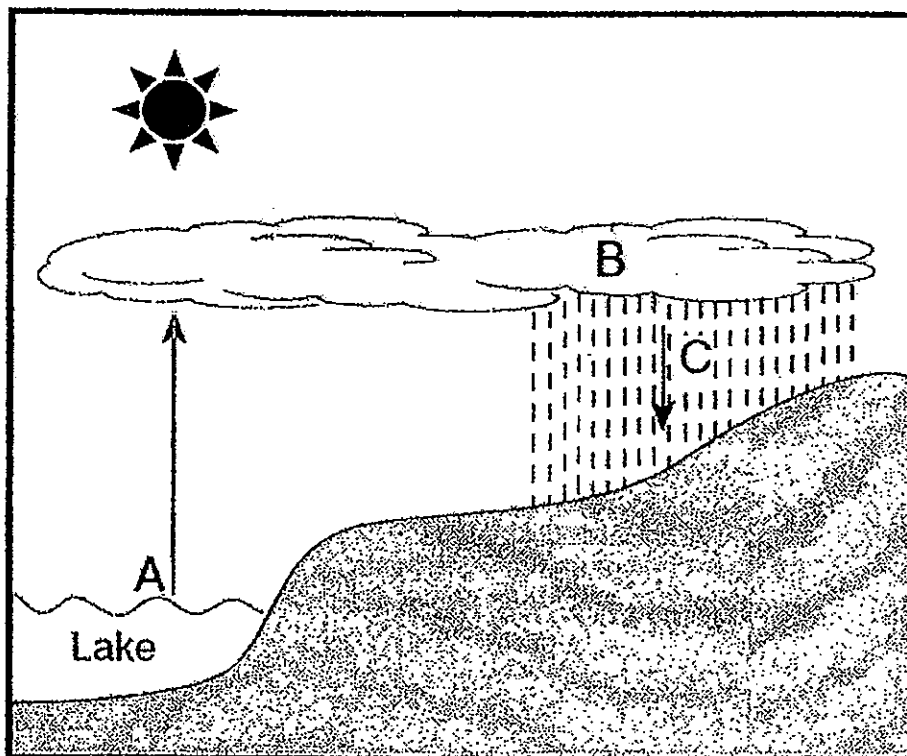
19. Study the statements below carefully.

- A Greenhouse effect will cause skin cancer.
- B The main cause of acid rain is deforestation.
- C The burning of fuels causes the greenhouse effect.
- D The breakdown of ozone layer causes global warming.

Which of the statements above are false?

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

20. The diagram below shows the water cycle.



A, B and C represent the different processes in the water cycle.

Which one of the following statements is **incorrect**?

- (1) Heat is lost during Process B.
- (2) Heat is gained during Process A.
- (3) Water exists as a liquid during Processes A, B and C
- (4) Process A can occur at any temperature below 100°C .

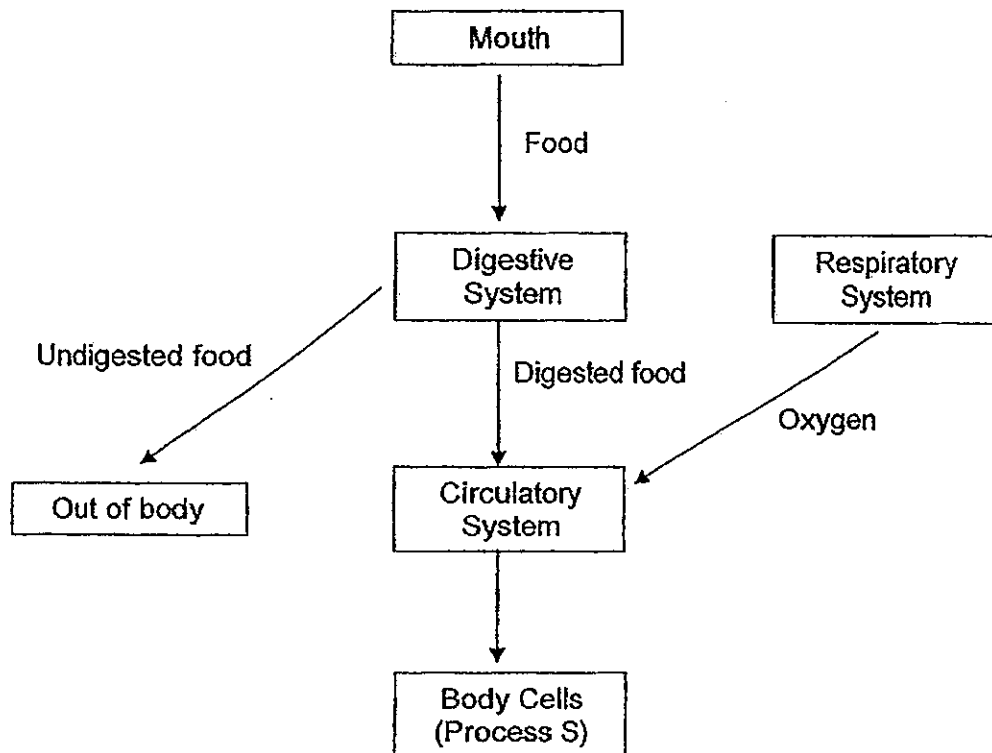
21. The diagram below shows the cross-section of a fruit.



Based on the diagram, which one of the following statements is definitely true about the flower from which this fruit has developed from?

- (1) The flower has many ovaries.
- (2) The flower is insect pollinated.
- (3) The flower has more than one ovule.
- (4) The flower has more than one stigma.

22. Study the flow chart below.



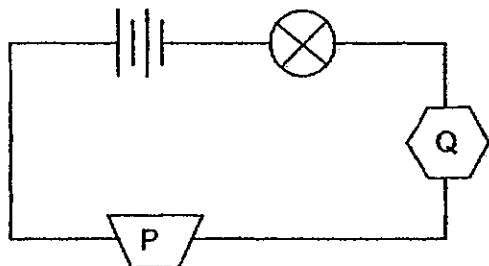
Which of the following statements are true?

- A All the food we eat goes through our digestive system and becomes digested food.
- B Some of our body systems work together to enable our body cells to get food and oxygen for Process S.
- C Our circulatory system carries oxygen and digested food to our body cells.
- D Process S releases energy in food for cell division and growth.

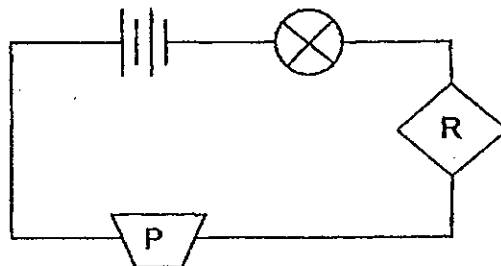
- (1) A and D only
- (2) B and C only
- (3) B, C and D only
- (4) A, B, C and D

23. Jessie set up the circuits below using a bulb, 2 dry cells and objects P, Q and R.

Bulb does not light up

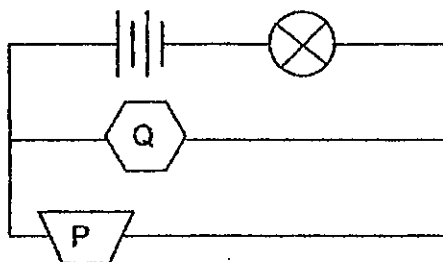


Bulb lights up

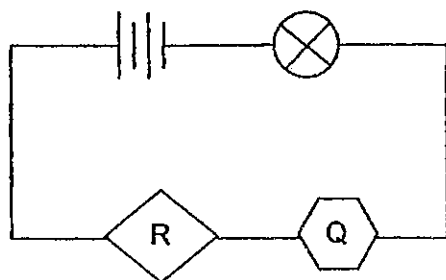
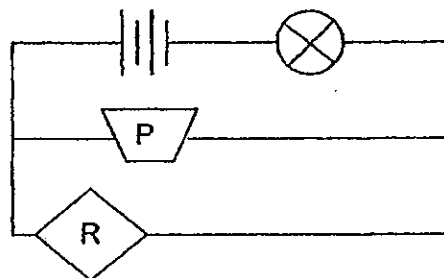


She used the objects P, Q and R, again to form the circuits below.

Circuit A



Circuit B

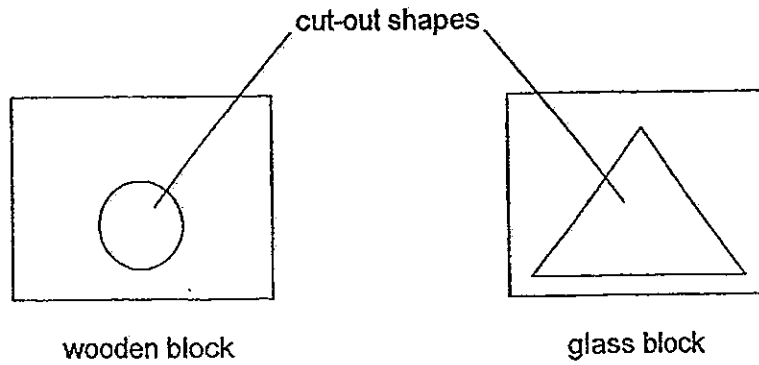


Circuit C

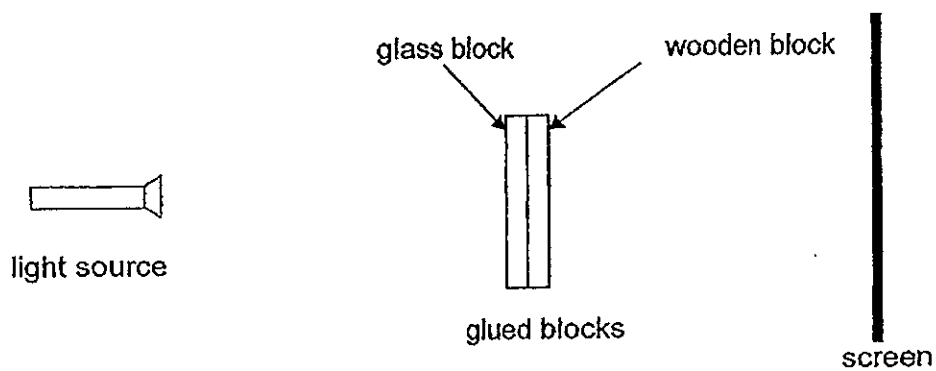
In which of the circuit diagrams shown above, A, B and C, did Jessie see the bulb light up?

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

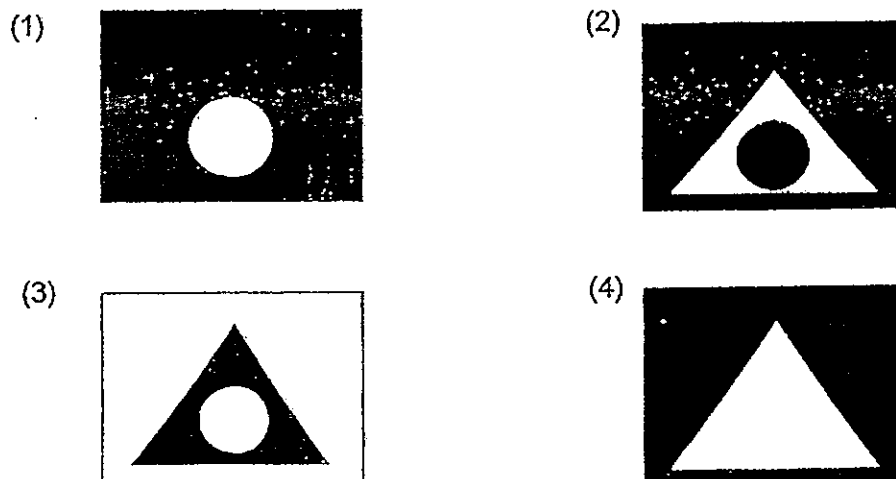
24. A circular shape was cut out from a wooden block and a triangular shape was cut out from a glass block as shown below.



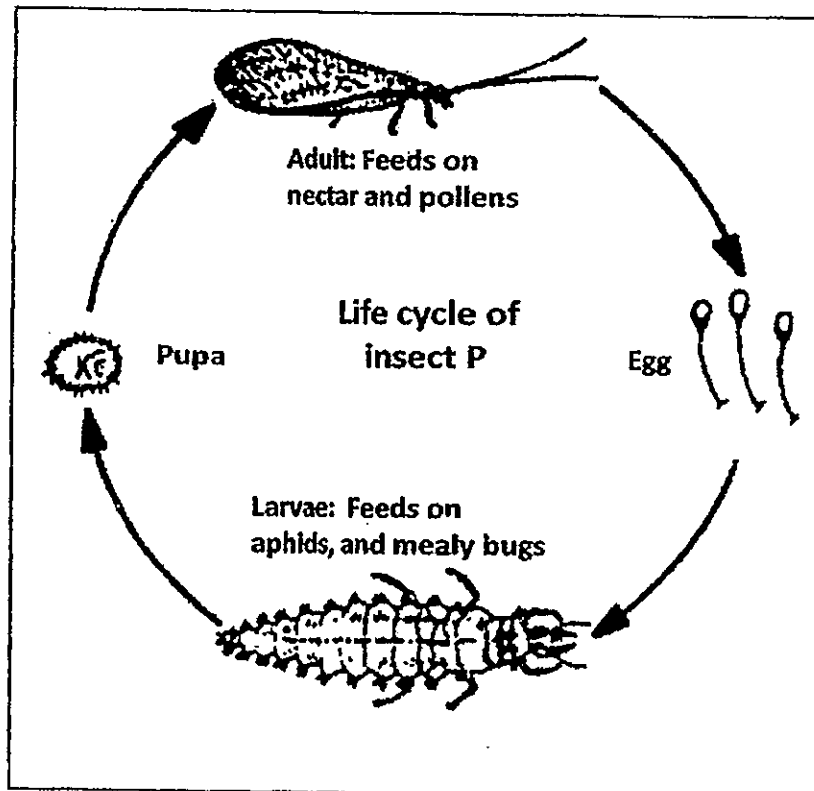
The two blocks were then glued together. A light source was brought near the glued blocks as shown in the diagram below.



Which one of the following is most likely to be the shadow formed on the screen?



25. Insect P is a predatory insect that attacks pest such as aphids, small caterpillars, mealy bug and other soft-bodied insects. Its life cycle and diets at the larval and adult stages are shown below.

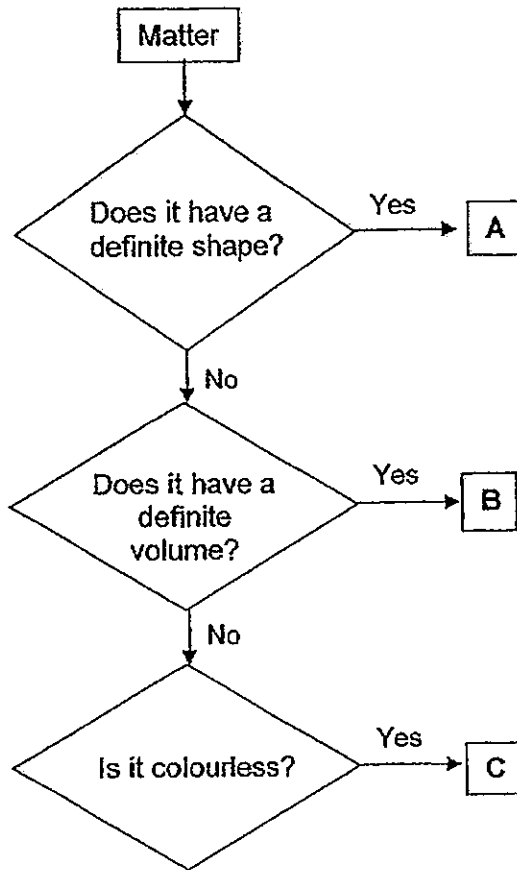


Which of the following statements is/are true?

- A Only the egg and pupa of insect P are harmless to crops.
- B Insect P can be introduced to the vegetable farm to control pests.
- C The young of insect P is a herbivore whereas its adult is a carnivore.

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

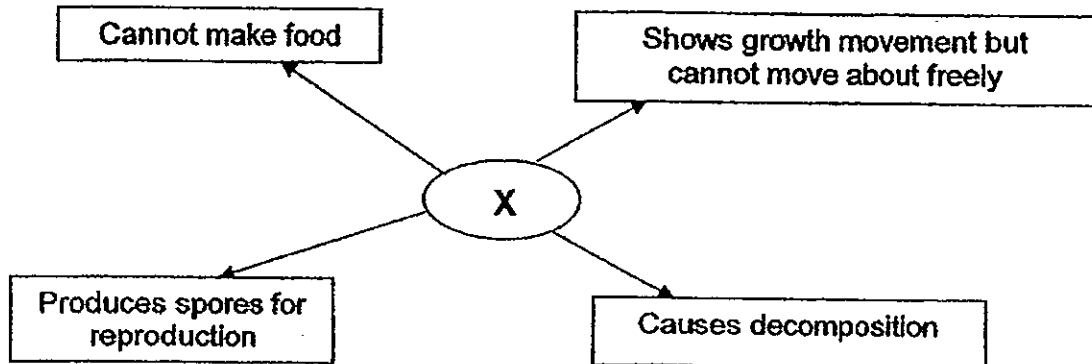
26. Study the flow chart below carefully.



Which of the following represents A, B and C?

	A	B	C
(1)	Ice	water vapour	water
(2)	rice grains	cloud	oxygen
(3)	plasticine	oxygen	steam
(4)	sponge	steam	cloud

27. Study the diagram below which shows some characteristics of Organism X.



What can Organism X be?

- A Mushroom
- B Earthworms
- C Bread mould
- D Bird's nest fern

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

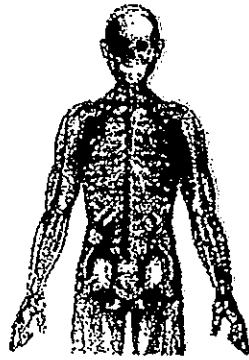
28. Susie has been asked to complete a table which matches the property of a material to its correct description.

Property	Description
Good electrical conductivity	Allows electricity to flow through it easily.
Good heat conductivity	Allows heat to flow through it easily.
Strong	X
Hard	Y

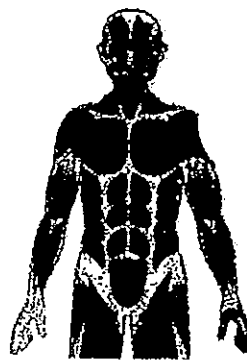
The first two descriptions were done for Susie. What descriptions should Susie choose for X and Y to complete the table correctly?

	X	Y
(1)	Can withstand damage to its surface caused by impact	Can support a heavy load without breaking
(2)	Can support a heavy load without breaking	Can withstand damage to its surface caused by heat
(3)	Can allow the heavy load to bend without breaking	Can withstand damage to its surface caused by friction
(4)	Can support a heavy load without breaking	Can withstand damage to its surface caused by scratches

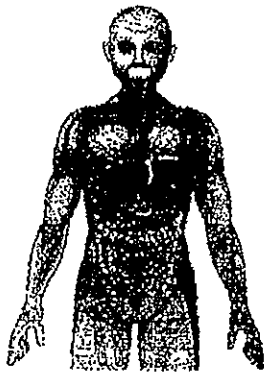
29. The diagrams below show some of our body systems.



Skeletal system



Muscular system



Digestive system



Respiratory system

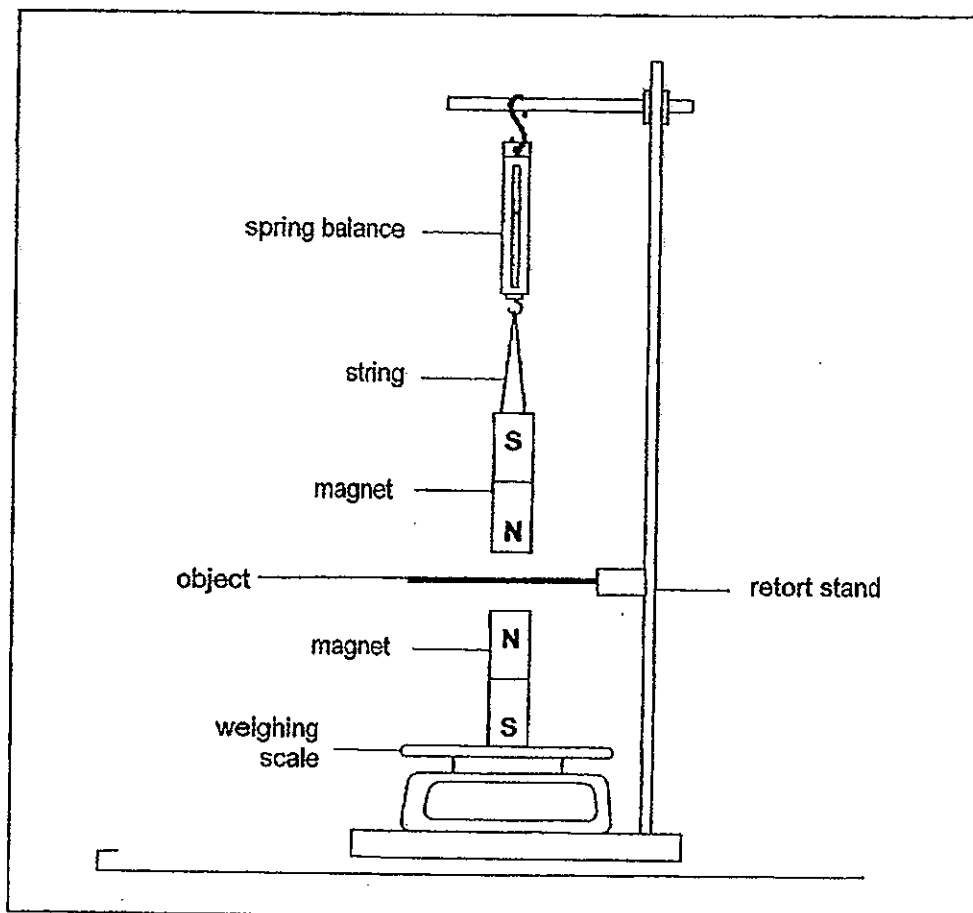


Circulatory system

John is playing piano. Which of the body systems above are required for him to carry out this activity?

- (1) Skeletal and muscular systems
- (2) Skeletal, muscular and circulatory systems
- (3) Digestive, respiratory and circulatory systems
- (4) All the above systems

30. Mr Tan set up an experiment as shown below with two identical magnets of weight 3N each to find out the properties of objects A, B and C.



The table below shows the readings on the weighing scale and spring balance when each object is used.

Object	Reading on spring balance	Reading on weighing scale
A	More than 3N	More than 3N
B	3N	3N
C	Less than 3N	More than 3N

Based on the result above, what can Mr Tan infer?

- (1) Object A is a ring magnet.
- (2) Object C is a magnetic material.
- (3) Object B is a thin sheet of paper.
- (4) All objects allow magnetism to pass through.

Index No:

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**NAN HUA PRIMARY SCHOOL
PRELIMINARY EXAMINATION – 2013
PRIMARY 6**

SCIENCE

BOOKLET B

14 Open-ended questions (40 marks)

Total Time for Booklets A and B : 1 hour 45 minutes

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the space provided.
2. Do not turn over the page until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Write your answers in this booklet.

Section B

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Name: _____ ()

Class: P 6 _____

Date: 29 August 2013

Parent's Signature: _____

Section B: (40marks)

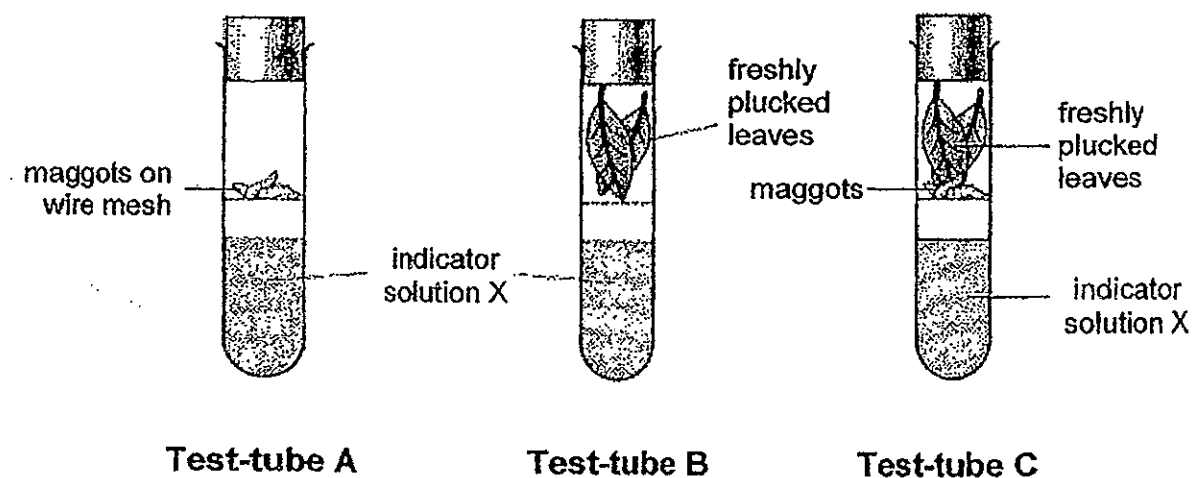
Write your answers to questions 31 to 44.

The number of marks available is shown in brackets [] at the end of each question or part question.

31. The table shows how indicator solution X changes colour when the concentration of carbon dioxide in it changes.

Concentration of carbon dioxide	Colour change
Increases	Orange to yellow
Decreases	Orange to purple

On a sunny day, Samantha set up the experiment shown below and put the three test-tubes on a window-sill. After 2 hours, she observed the colour of the indicator solution X and recorded the results in a table.



(a) Complete the table below.

[1]

Test-tube	Colour of the indicator solution X
A	
B	
C	Orange

(b) Explain your answer in (a) for Test-tube B.

[1]

(c) Explain why the indicator solution X remained orange in Test-tube C.

[1]

Score	3
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32. An investigation was carried out to find out how light affects where woodlice are found.
Two woodlice were placed in the middle of a transparent tray with a plastic lid. Half of the lid was black to keep out light. The other half was clear to let in light. After 1 minute, the number of woodlice in each half of the tray was recorded.



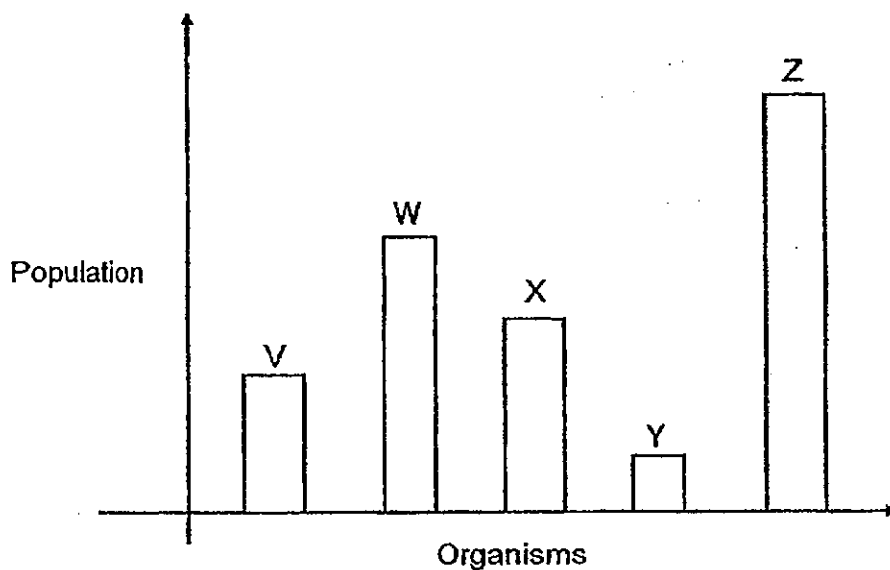
The result of the investigation was recorded in the table below.

Number of woodlice in light	Number of woodlice in dark
1	1

The investigation was fair but could be improved to make the results more reliable. Other than repeating the experiment, suggest two other improvements that could be made. [2]

Score	2
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33. The bar graph below shows the population of 5 living organisms V, W, X, Y and Z that make up a food chain in a community. (Note: These organisms are not found in a single-tree community.)



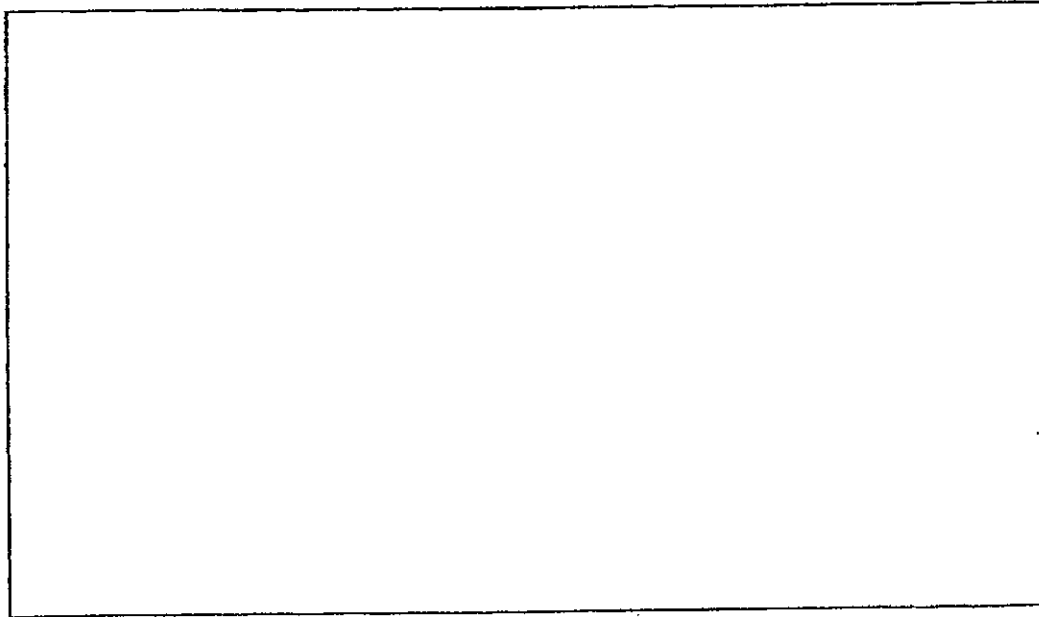
- (a) Which organism(s) is likely to be the prey of X?

[1]

- (b) There are 3 other populations of organisms, P, Q and R living in this habitat. Organism P is a food producer while Q and R are food consumers. The table below shows the food that organisms Q and R eat.

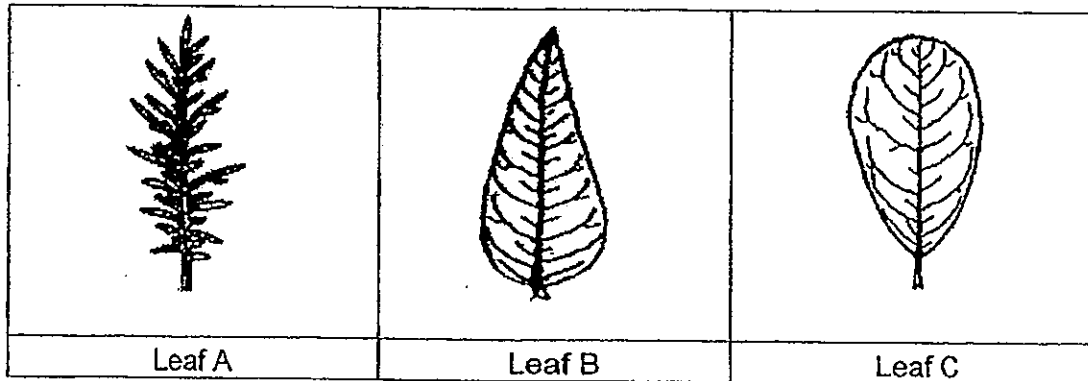
Organism	Food
Q	P, Z and X
R	P, Q and Y

Based on the information provided, draw a food web to show the food relationships of the eight organisms. [2]



Score	3
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34. Plants that live in cold climate are adapted to survive in the harsh environment. Falling snow can collect on the leaves causing the branch or leaf stalk to break. Hence, plants in the cold climate have leaves that are adapted to reduce heavy snow build-up. The diagrams below show three types of leaves.

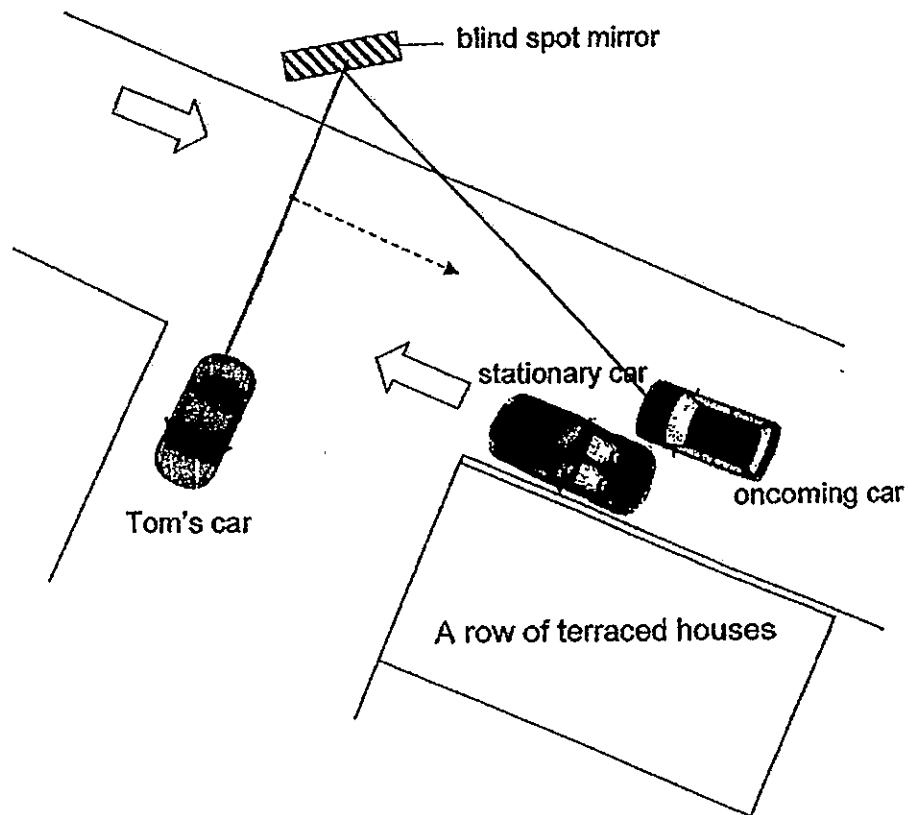


- (a) Which one of the leaves above is best adapted for preventing the leaf stalk from breaking due to snow build-up? Explain your answer. [2]

- (b) List another advantage of having this type of leaves in cold climate. [1]

Score	3
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35. Residents living in an estate face a problem when they drive towards a T-junction. They could not see oncoming cars on the right because their view is blocked by the houses and residents' cars parked outside their houses.

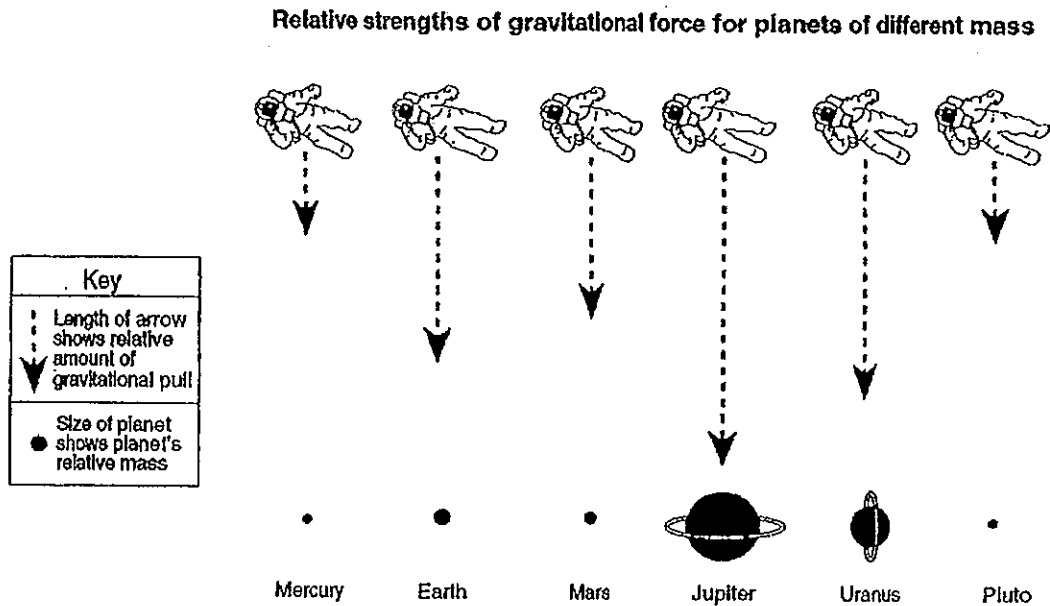


- (a) Tom is in his car and he is not able to see the oncoming car directly from his current position. State a property of light that supports this. [1]

- (b) Tom is able to see the oncoming car using the blind-spot mirror. Draw arrows on the diagram above to show how Tom is able to do so. [1]

Score	2
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36. The diagram below shows the relative strengths of the gravitational force for planets of different masses. The size of each planet represents the planet's relative mass. The arrow length indicates the relative amount of gravitational pull that each planet would exert on an astronaut in space.

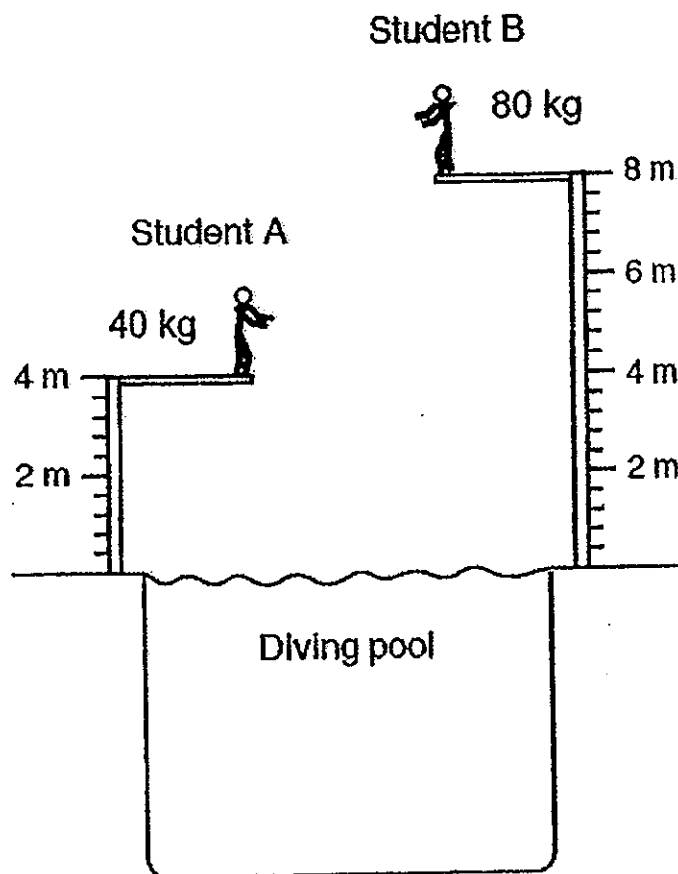


- (a) What is the relationship between the mass of the planets and the relative strength of their gravitational pull? [1]

- (b) How will the weight of the astronaut change when he travels from Earth to Mercury? Give a reason for your answer. [1]

Score	2
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37. The diagram below shows two students ready to dive into the pool.

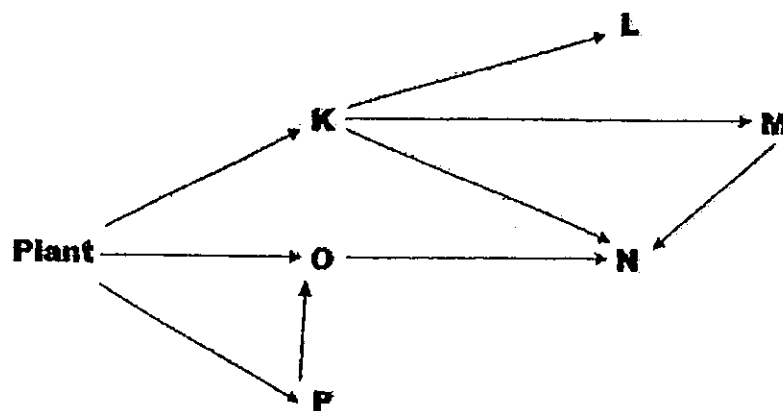


- (a) Who has more gravitational potential energy in the diagram? Give two reasons for your answer. [1]

- (b) Student A dives from the board into the water. Explain clearly why Student A's kinetic energy decreases as he enters the water. [1]

Score	2
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38. Study the food web below.



- (a) Which one of the following animals need to have a higher rate of reproduction, in order to maintain its population, if predation (being eaten by predators) is the only cause of a decrease in its population? Give a reason for your answer. [1]

- (b) Name the animal(s) that is/are both a prey and a predator in this food web? [1]

- (c) How many food chains make up this food web? [1]

- (d) How does animal N help to ensure that there is less competition for food among animal O? [1]

Score	4
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39. Spider A uses patterns in the middle of their webs, such as zigzags, to mimic the pattern seen in many flowers.



- (a) Suggest a reason why a bee would be attracted to the zigzag web of spider A? [2]

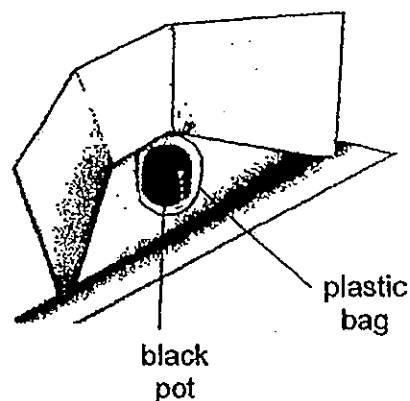
- (b) What is the benefit to spider A when the bee visits its web? [1]

Score	3
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40. Almost half of the world's population uses wood fires to cook food. When natural disasters occur, a large number of people are moved into temporary refugee camps. To minimize negative impact on the environment, the refugees are not allowed to collect firewood from outside the refugee camp. They must rely on limited wood supplies being provided by aid workers.

In one aid project, refugees were provided with solar cookers instead of firewood. Constructed from shiny, foil-covered cardboard, the cookers fold flat and are easy to transport.

To use the solar cooker, a black pot containing the food is placed inside a large plastic bag. The bag is then placed in the centre of the solar cooker. The solar cooker can also be used to treat drinking water to make it safe to drink.



- (a) How does discouraging the refugees from collecting firewood from outside the camp help to minimize negative impact on the environment? [1]

- (b) Give two other advantages of solar cookers. [1]

- (c) How does the plastic bag help to cook the food? [1]

- (d) Why does heating water to 100°C make it safe to drink?

Score	
	4

- 41 The fruits of plant R at different stages of development are shown below. Ripe fruit has seeds that are tough and usually undamaged when eaten. Immature seeds in unripe fruit would die if eaten by animals.

Ripe fruit -
Red colour



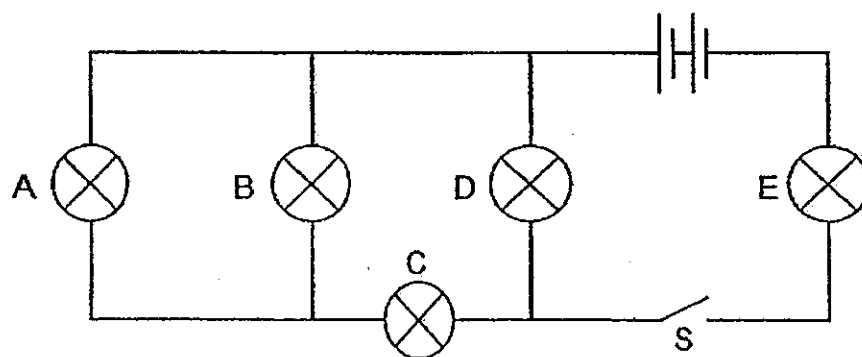
Unripe fruit -
Green colour



Based on the information above, explain how the two different colours of the fruits of plant R increase its chance of reproduction. [2]

Score	2
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42. Dan built circuit 1 as shown below.

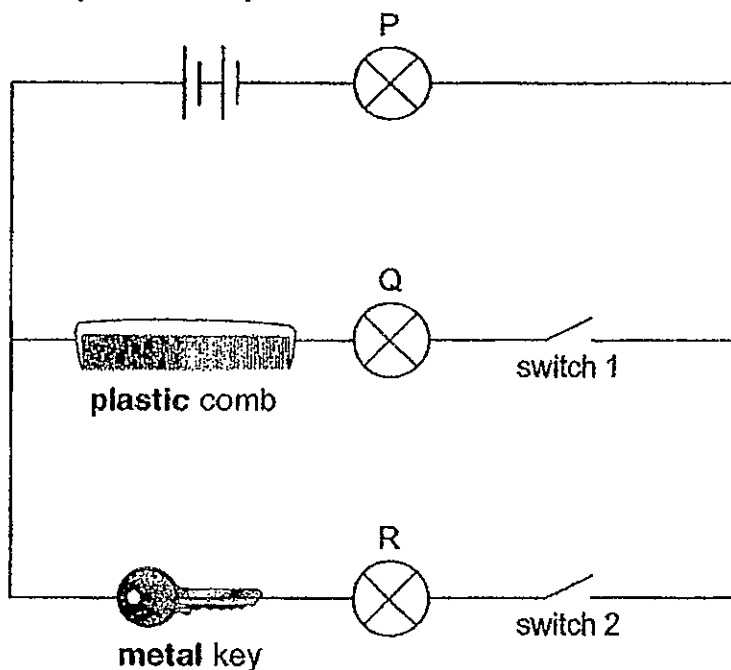


circuit 1

- (a) He then closed the switch, S, and all the bulbs lighted up. One of the bulbs then fused and all the bulbs went off. Which bulb must have fused?

[1]

- (b) The next day, Dan built circuit 2 as shown below. He connected a plastic comb and a metal key in different parts of the circuit.



circuit 2

43. Jolene used an air pump to inflate a deflated toy. She measured the mass and volume of the toy after each pump and recorded her results as shown below.

Number of pumps	Mass of toy(g)	Volume of toy(cm^3)
1	415	500
2	430	580
3	458	650
4	523	650

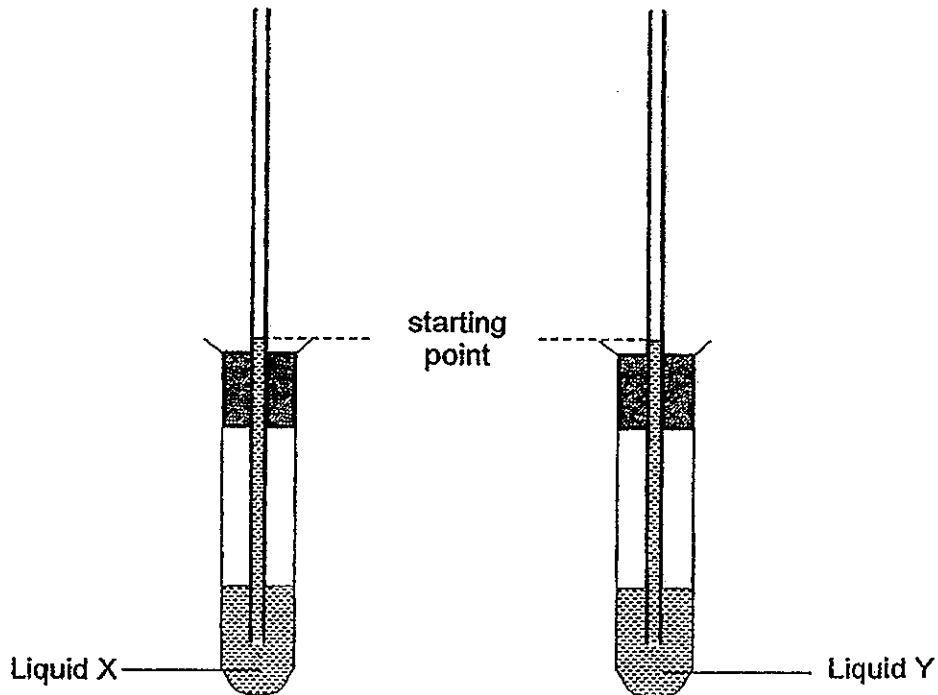
- (a) Based on the results above, state one property of air. [1]

- (b) Why did the mass of the toy increase but the volume of toy remain constant from the 3rd to the 4th pump? [2]

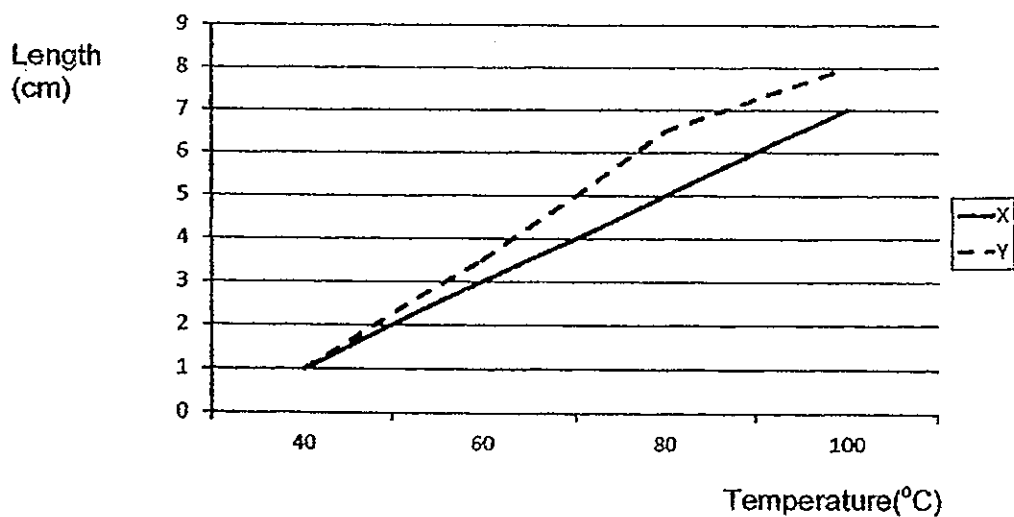
Score	3
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- 44 Mary constructed two DIY(Do-it-yourself) thermometers using liquid X and liquid Y respectively.

She placed the two thermometers into basins of hot water at temperatures 40°C , 60°C , 80°C and 100°C , one at a time. She recorded the length of the column of liquid above the starting point at each temperature.



The graphs below show the change in the length of the columns of liquid X and liquid Y when they were placed in hot water at various temperatures.



- (a) The length columns of liquids X and Y increased when they were placed in hot water. Give a reason for this observation. [1]

- (b) Based on the result of Mary's experiment, which liquid is more suitable for making a thermometer? Explain your answer. [2]

Score	3
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Answer Key

EXAM PAPER 2013

SCHOOL : NAN HUA

SUBJECT : PRIMARY 6 SCINECE

TERM : PRELIM

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

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

31)a)A: Yellow B: Purple

b)The freshly plucked leaves would take in the carbon dioxide in the test-tube to photosynthesise in the presence of light, causing the concentration of carbon dioxide to decrease, and solution X to turn purple.

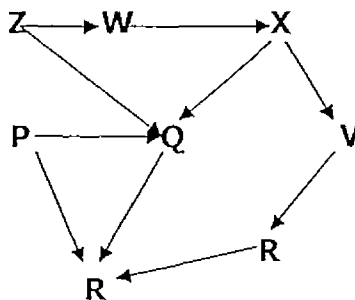
c)The test tube is covered so no gases can enter or exit the test tube. The leaves would take in carbon dioxide from the beaker, and give out oxygen during photosynthesis and the maggots will take in the oxygen and give out carbon dioxide during respiration and the cycle repeats, balancing up the carbon dioxide and oxygen level in the test tube.

32)1)Use a opaque tray instead of a transparent tray.

2)Add more wood louse into the middle of the tray.

33)a)Organism W.

b)

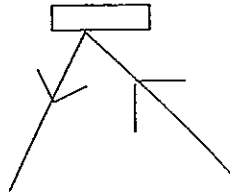


34)a) Leaf A. The needle like leaves prevent the snow from collecting on the leaf blade. Thus, less force is exerted on the leaf main vein preventing it from breaking.

b) It reduces water loss through transpiration.

35)a) Light travels in a straight light.

b)



36)a) As the mass of the planets increases, the relative strength of their gravitational pull increases.

b) The weight of the astronaut decreases the gravitational pull on Mercury is less than the gravitational pull on earth,

37)a) Student B. He is heavier than student A and also raised at a higher height.

b) Some of the kinetic energy was converted into sound and heat energy.

38)a) Animal K. It has the most number of predators.

b) Animal O and M.

c) 5.

d) Animal N feeds on animal O and helps to control the population of animal O.

39)a) The bee would think that the zigzags web of spider A are flowers and contain nectar. As bees like nectar, it will be attracted to the web.

b) The stick web sticks the bee to the web, preventing the bee from escaping and the spider can feed on the bee.

40)a) To prevent too many trees from being cut down.

b) 1) Solar is a clean source of energy and does not cause pollution.

2) Solar is a renewable source of energy.

c) The plastic bag is used to trap heat in order to cook the food inside the black pot.

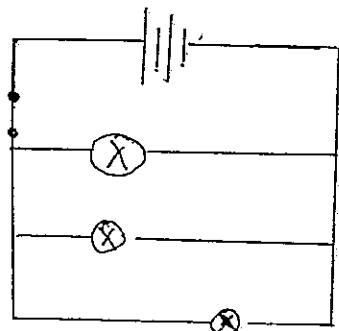
d) It kills all the harmful bacteria in the water.

41) Red coloured fruits are easily spotted by the animals which eat them and help to disperse their seeds. The unripe fruit camouflaged with the leaves, less easily spotted and immature seeds are not eaten.

42)a) Bulb E.

b) on	off	on
off	off	off

42)c)



43)a)Air takes up space.

b)The toy was fully inflated but the air in it compressed and more air could be pumped in and take up space, increasing the mass.

44)a)Liquids X and X gained heat from the hot water and expanded, causing the length of the columns to increase.

b)Liquid X. It expanded consistently with temperature. It will be able to give more consistent result when used in a thermometer.

