NANYANG PRIMARY SCHOOL

PRIMARY 6 SCIENCE

PRELIMLIMARY EXAMINATION 2009

BOOKLET A

Date : 27 August 2009

Duration : 1 h 45 min

Name : _____ **( )**

Class: Primary 6 ( )

Marks Scored:

Booklet A:		**60**
Booklet B :		**40**
Total :		**100**

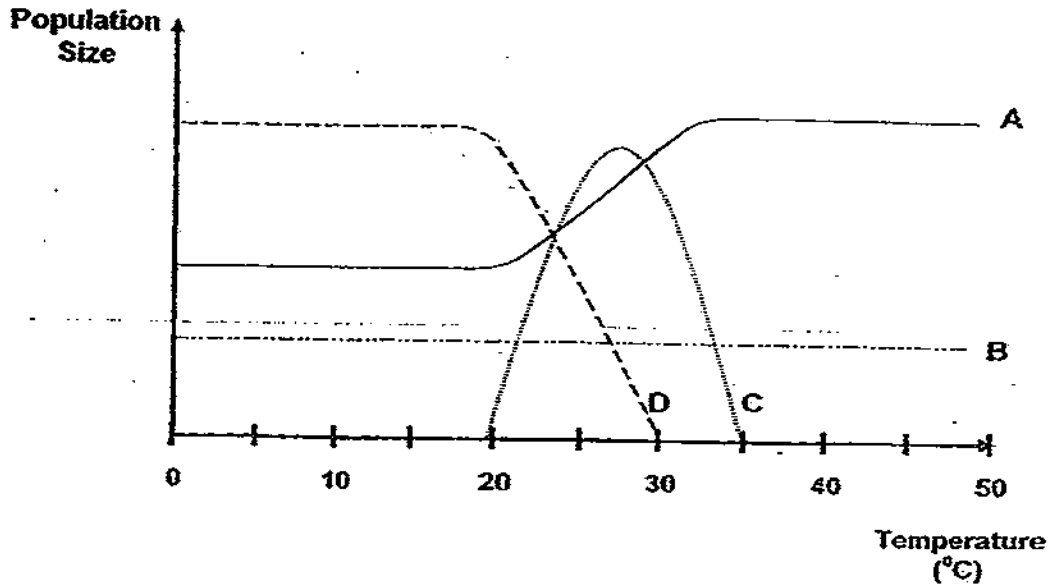
Parent's signature: .....

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

Booklet A consists of 19 printed pages including this cover page.

Section A (30 x 2 marks = 60 marks)
For each question from 1 to 40, 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 provided.**

1. The graph below shows the effect of temperature of the environment on the populations of 4 different organisms, A, B, C and D.



Which one of the following statements is correct?

(1) Organism B is most sensitive to temperature change.
(2) Organism D is not affected by the temperature change
(3) Both Organism C and Organism D survive best at 20°C.
(4) Organism A survives better when the temperature is above 30°C.

2. Which of the following consists only of sources of energy?

(1) sun, rock, fuel
(2) oil, air, waterfall
(3) wood, food, wind
(4) coal, magnet, natural gas

3. Megan grew a plant, X, in a big glass bottle. She watered the soil to ensure that it was moist before she placed an earthworm in the glass bottle. She then sealed the bottle. She left the bottle near an open window for 2 weeks. Megan recorded her observations and wrote down her conclusion.

Which one of the following **correctly** shows what Megan would observe about the earthworm at the end of the experiment and the conclusion that she could draw from the experiment?

	Observation of the earthworm	Conclusion
(1)	dead	Both the earthworm and Plant X have used up all the water in the bottle.
(2)	dead	There was not enough air in the bottle for respiration
(3)	alive	Plant X die and was decomposed by the earthworm.
(4)	alive	There was sufficient basic needs for both the earthworm and Plant X.

4. En Jie went hiking and saw a rotting log. There were many organisms living on and in the rotting log. En Jie learnt that it was a rotting log community.

En Jie made the following statements about the rotting log in his notebook.

A The rotting log was once alive.

B The bracket fungus and the termites found on the rotting log were decomposing the rotting log.

C Centipedes, millipedes, termites and bracket fungus were some organisms in the rotting log community which were interdependent.

Which of the following statement(s) is/are correct?

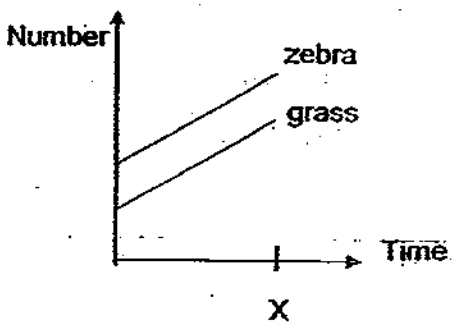
(1) A and B only
(2) A and C only
(3) B and C only
(4) A, B and C

5. The grass, zebras and lions on the grassland, formed a food chain as shown below.

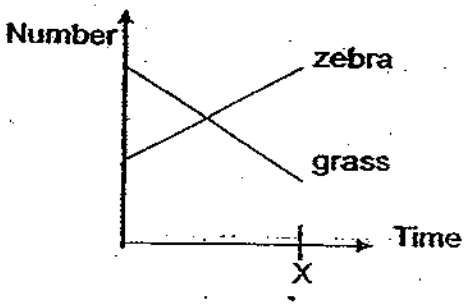
grass ⟶ zebra ⟶ lion

If poachers were active in hunting the lions on the grassland, which one of the following graphs would correctly show the effects of the hunting on the population of grass and zebras over a period of time, X?

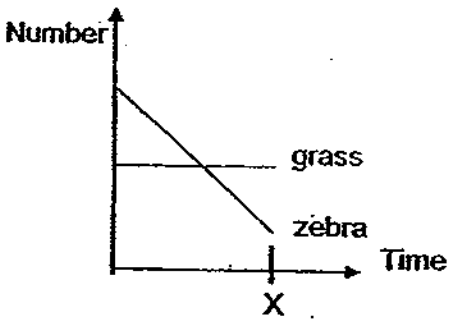
(1)



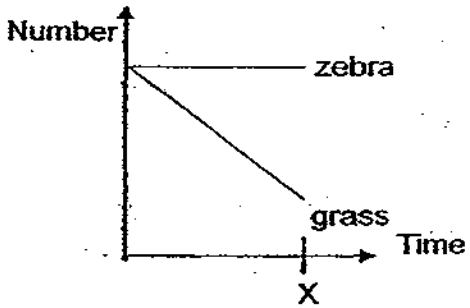
(2)



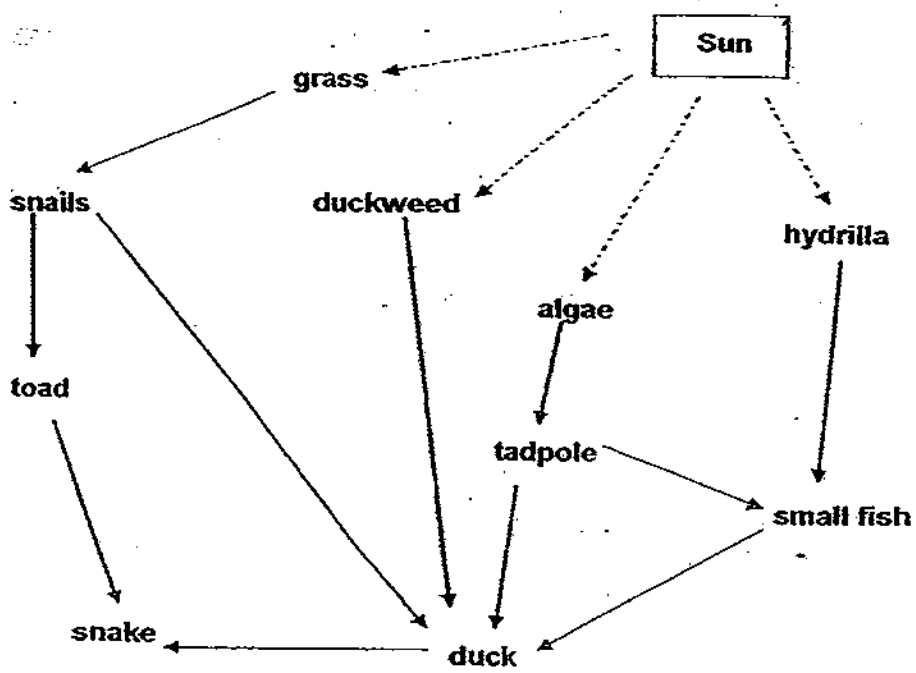
(3)



(4)



6. Study the diagram below which shows the relationships between the organisms in the pond community and the Sun.



Which of the following statements about the above diagram is true?

A There are 6 food chains in the pond community.

B The organisms in the community are interdependent.

C The diagram shows how energy is passed through the community.

D The diagram shows only the relationships of organisms in the pond community

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

7. Which one of the following statements about toadstools and bacteria is correct?

(1) Only toadstools need water.
(2) Toadstools can make their own food but not bacteria.
(3) Only toadstools will respond to changes in the environment.
(4) Toadstools and bacteria are able to decompose food producers and consumers.

8. John lives in a temperate country where he always experiences the four seasons. There are 2 different trees outside his house.
The Oak tree has broad leaves. It sheds its leaves during autumn and remains "leafless" throughout winter.
The Pine tree has needle-like leaves which remain green throughout the whole year even in the winter.
John also noticed that the soil was very cold and dry in winter.

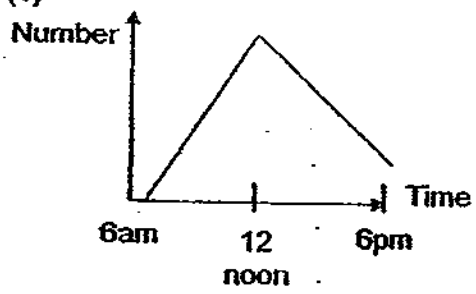
Which one of the following statements is **false**?

(1) Both trees need water during winter.
(2) Oak tree die during winter and will revive in spring.
(3) Oak tree sheds its leaves to reduce water loss during winter.
(4) Little water is lost through the needle-like leaves of the Pine tree hence there is no need to shed them for winter.

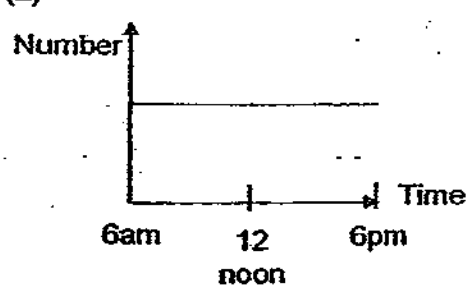
9. Jane observed the behaviour of lizards in a particular area, Z, in the desert. At night, the lizards hide in the sand to keep themselves warm. When the sun comes out, the lizards lie on stones to warm their bodies. During the hottest part of the day, the lizards hide themselves under stones to stay cool.

Which one of the following graph **correctly** shows the number of lizards Jane spotted on the sand throughout the day, in Area Z, where there are many stones?

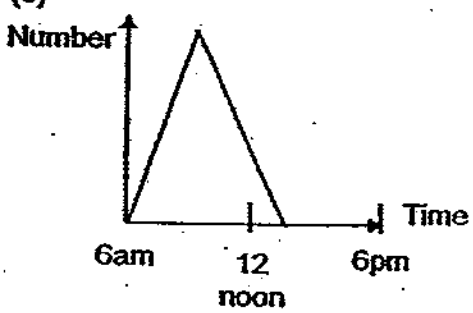
(1)



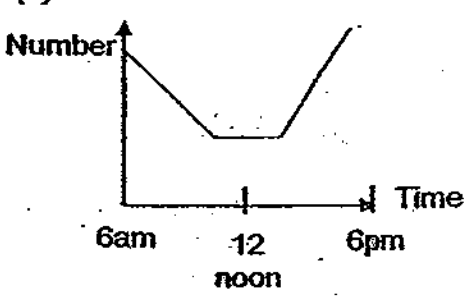
(2)



(3)



(4)



10. Animals such as antelope and deer live in groups. This is one of the behavioural adaptation of the animals to help them survive better in the grassy plains of Africa.

Which of the following explains how living in herds help these types of animals to increase their chances of survival on the grassy plains?

A The animals move together to look for food.
B These animals, when in groups, can attack their predators.
C The animals in their own group warn each other when they sense danger and move together.
D Predators, intimidated by their great number, will not attack them when they are in their groups.

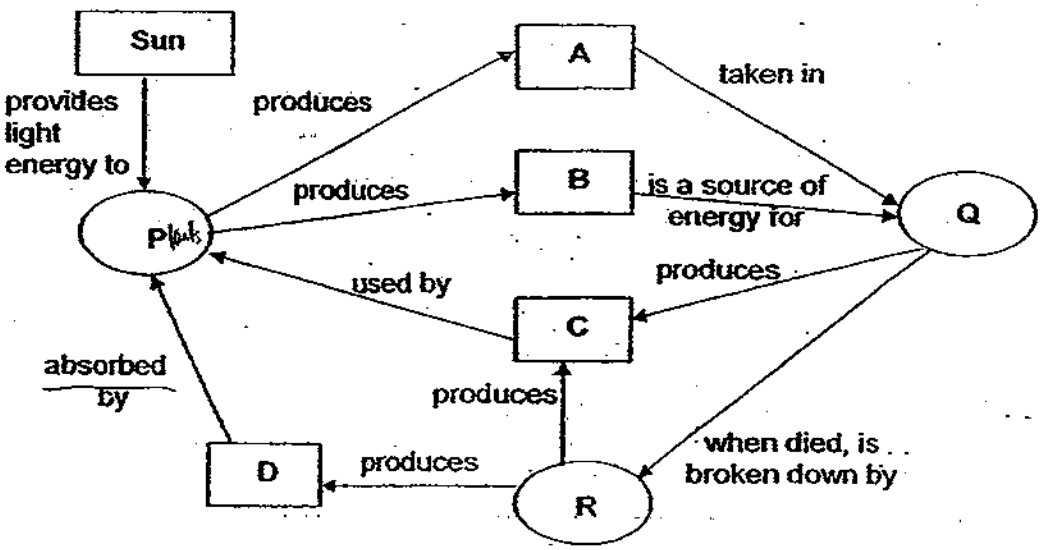
(1) A and B only
(2) A and C only
(3) A, B and C only
(4) B, C and D only

11. Hassan noticed 2 different plants, the Strangling Fig and the Bird's Nest Fern growing on the Angsana tree outside his house. He observed that the Strangling Fig has sunk its roots deep into the branches of the Angsana tree. Roots of the Bird's Nest Fern are tucked neatly in its "nest" on the branches of the Angsana tree with some hanging loosely. There are also many other organisms on the Angsana tree.

Which one of the following statements made about the plants is **false**?

(1) The Angsana tree is a single tree community.
(2) The Strangling Fig cannot make its own food hence it depends on the Angsana tree for food.
(3) The Bird's Nest Fern uses the Angsana tree as a support hence will not harm the Angsana tree.
(4) The Strangling Fig obtains some nutrients and water from the Angsana tree hence the Angsana tree will die if the Strangling Fig flourishes.

12. Study the concept map below.
Organisms P, Q and R are found in most communities.



What do the letters A, B, C and D represent in the concept map?

	A	B	C	D
(1)	oxygen	food	carbon dioxide	water
(2)	energy	carbon dioxide	water	food
(3)	food	oxygen	carbon dioxide	water
(4)	oxygen	water	food	carbon dioxide

13. Salim dropped a Saga seed from a height of 5 metres and found that it took the seed 1 second to reach the ground. He then dropped three different fruits X, Y and Z from a height of 5 metres and recorded the time each fruit takes to land on the ground. He conducted the same experiment 3 times for each type of fruit. The following table shows his results.

		Fruits		
		X	Y	Z
Time taken (sec)	1st try	1.1	4.6	2.7
	2nd try	1.2	4.9	3
	3rd try	1.1	5	2.3

What fruit is Y most likely to be?

(1) Rubber
(2) Shorea
(3) Mimosa
(4) Pong Pong

14. Which of the following is/are (an)unicellular organism(s)?

A Yeast
B Amoeba
C Flower bud
D Fertilized egg

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

15. Nadia conducted an experiment on a balsam plant which was not watered for 2 days. She recorded her first observation of the plant and the leaf cells in the table as shown below. After that, she watered the plant and recorded her second observation.

	Observation	
	Leaf cells	Plant
First observation	Vacuoles had shrunk.	Leaves had shrivelled and were wilting.
Second observation	Vacuoles were full and filled with cell sap.	Leaves were spread open and healthy.

What conclusion could she draw from her observations?

(1) The leaf cells had died.
(2) The leaf cells had become old.
(3) The food in the vacuoles had been used up.
(4) Leaf cells are kept firm by the sap in the vacuoles.

16. Which of the following are transported by blood?

A Water
B Oxygen
C Digested food
D Carbon dioxide
E Waste substances

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

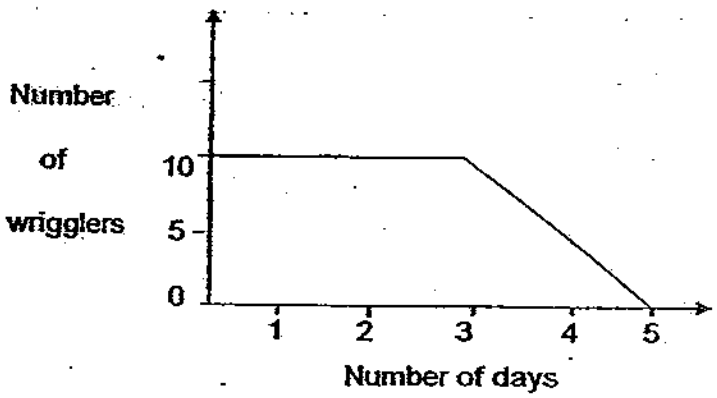
17. The table below shows the boiling and melting points of some substances.

Substances	Boiling point (°C)	Melting point (°C)
W	150	99
X	100	65
Y	85	15
Z	-16	-128

Which substance W, X, Y or Z is a liquid at 40°C?

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

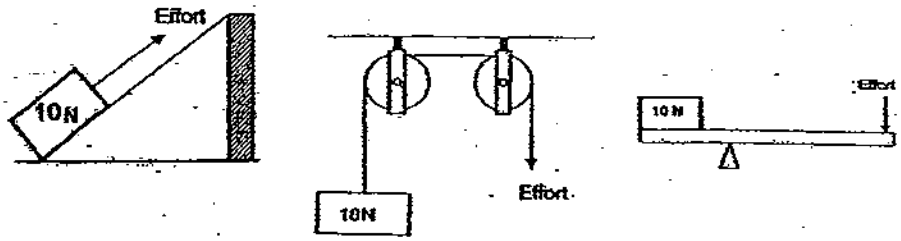
18. Jin Yi put 10 wrigglers into a container containing 2 litres of water. He observed them over 5 days and plotted the result in a graph as shown below.



Which one of the following would not contribute to the decreasing population of the wrigglers?

(1) A fish was introduced on the third day.
(2) A layer of oil had been poured over the water.
(3) The wrigglers had turned into adult mosquitoes.
(4) Jin Yi moved the container into a dark room on Day 3.

19. Set-up A, B and C are three simple machines with similar loads of 10N.

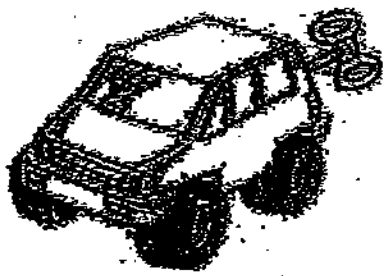


Set-up A Set-up B Set-up C

Which of the following set-up(s) require(s) less than 10N to move the load?

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

20. Johnny used the toy car shown below to find out the relationship between the number of turns of the key and the distance it travelled.



The results he obtained are shown below.

Number of turns of the key	2	4	6	8
Distance travelled (cm)	20	30	40	50

Based on the results, which one of the following inferences can be made about this experiment?

(1) The faster the key was turned, the faster the toy car travelled.
(2) The faster the toy was wound, the greater the potential energy.
(3) The greater the number of turns of the key, the greater the potential energy.
(4) The greater the potential energy, the greater the number times the toy was wound.

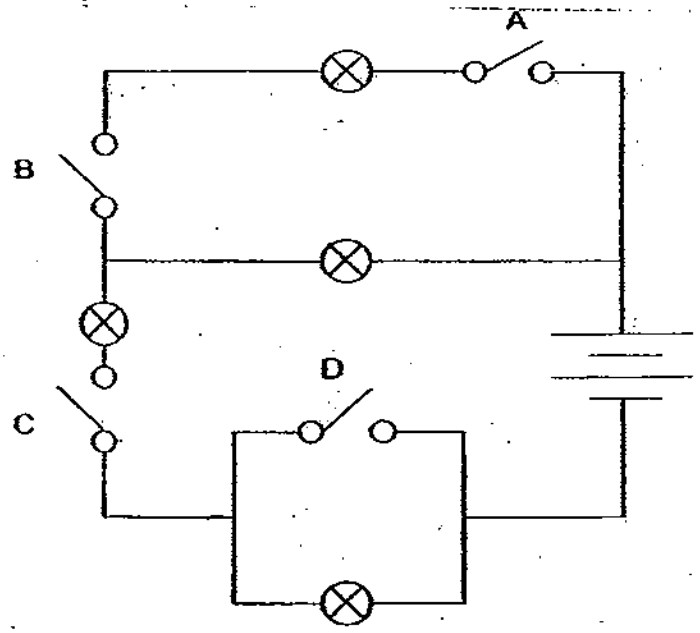
21. The table below shows the length of a spring when different weights are hung from it.

Weight (g)	Length of spring (cm)
20	7
60	9
100	11
160	14

What is the original length of the spring?

(1) 4 cm
(2) 5 cm
(3) 6 cm
(4) 7 cm

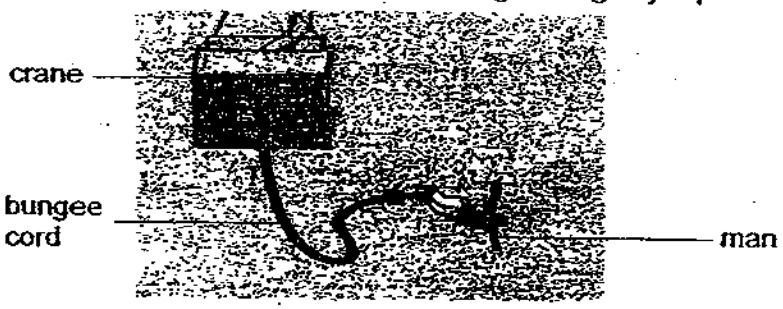
22. The diagram below shows an electrical circuit.



List the least number of the switches needed to be closed for all of the bulbs to light up.

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

23. The diagram below shows a man doing a bungee jump.



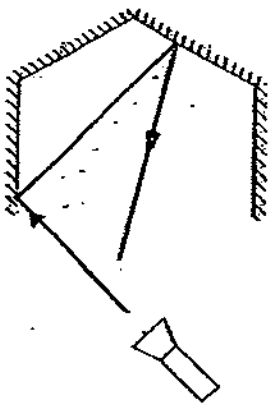
What are the forces acting on the man who has **just** jumped off the top of a crane?

A Gravity
B Air resistance
C Elastic spring force

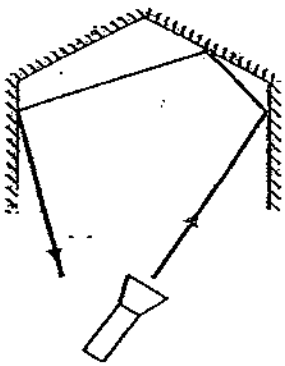
(1) A and B only
(2) A and C only
(3) B and C only
(4) A, B and C

24. Sally arranged four mirrors and shone a torch as shown in the diagrams below.
Which diagram correctly shows the path of a ray of light from the torch?

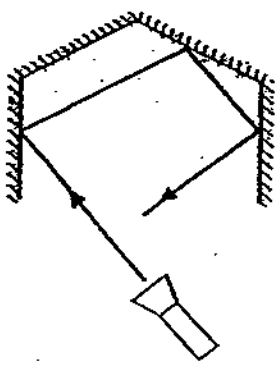
(1)



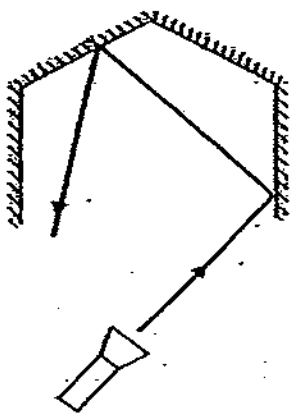
(2)



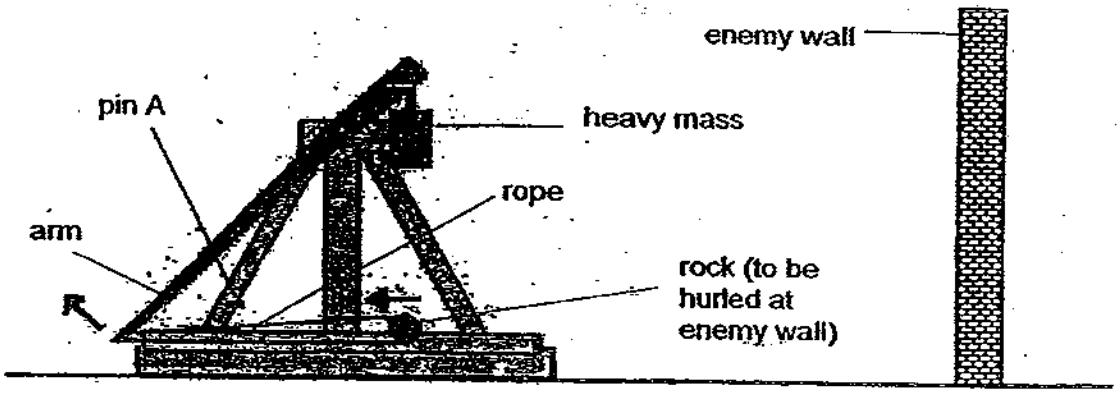
(3)



(4)

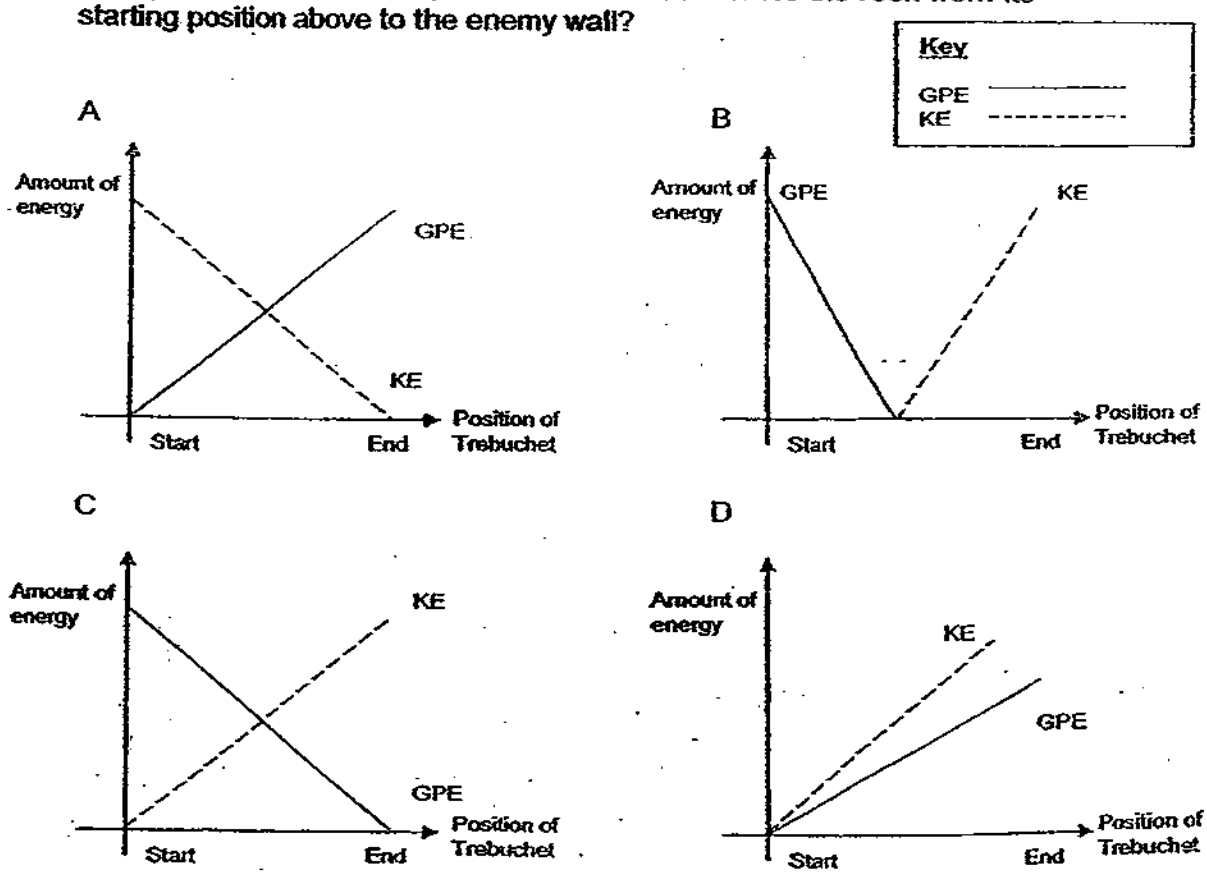


25. Study the diagram of a trebuchet below.
When pin A was released, the heavy mass will drop down and the arm will swing upwards in a clockwise direction. This will cause the rock to be hurled at the enemy wall some distance away.
(Objects not drawn to scale)



Trebuchet at start launch position

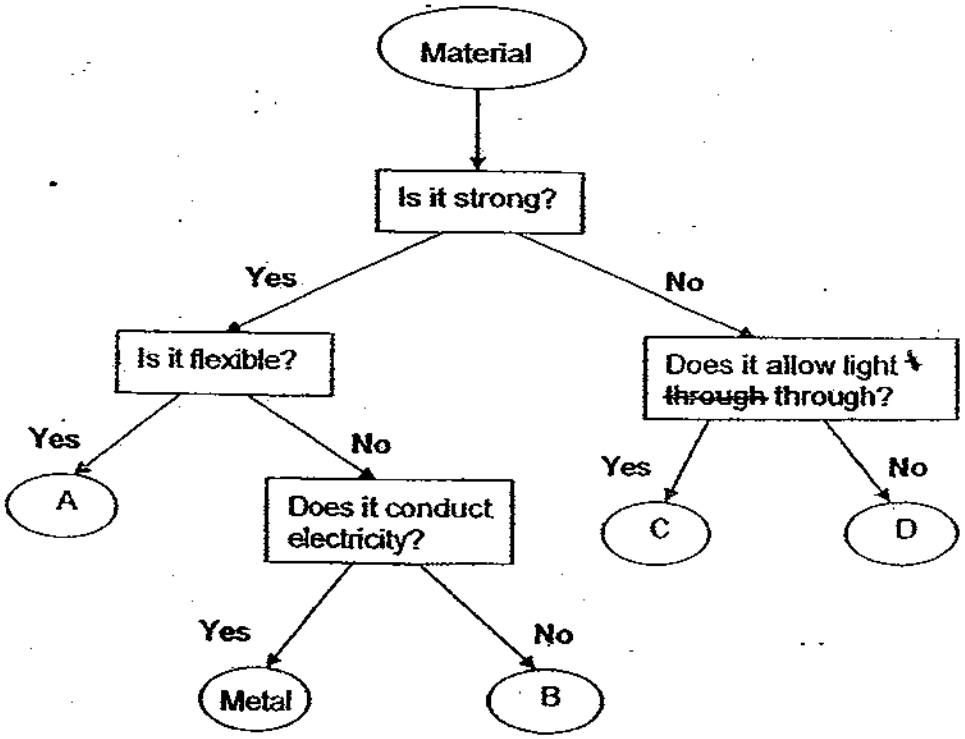
Which two of the following graphs most likely represent the change in the amount of gravitational potential energy and kinetic energy of the **heavy mass** and the **rock**, as the trebuchet launches the rock from its starting position above to the enemy wall?



25. (continued)

	GPE and KE of mass	GPE and KE of rock
(1)	Graph A	Graph B
(2)	Graph B	Graph C
(3)	Graph C	Graph D
(4)	Graph D	Graph A

26. Study the flowchart below.



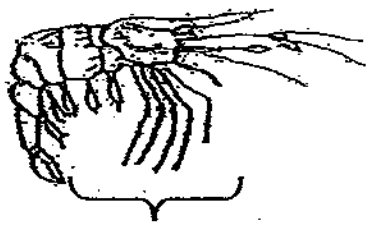
Which of the following is likely to be Materials A, B, C and D?

	A	B	C	D
(1)	clay	glass	plastic	wood
(2)	rubber	wood	glass	ceramics
(3)	paper	glass	rubber	copper
(4)	plastic	ceramics	paper	glass

27. The following classification key is one way to classify animals without backbones.

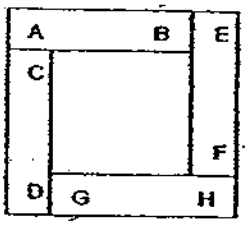
	Characteristics	
No.1	a. Has legs	Go to No.4
	b. Does not have legs	Go to No.2
No.2	a. Body with a shell	Group A
	b. Body without a shell	Go to No.3
No.3	a. Body with segments	Group B
	b. Body without segments	Group C
No.4	a. Has 3 pairs of legs or less	Group D
	b. Has more than 3 pairs of legs	Go to No.5
No.5	a. The length of all the legs are equal	Group E
	b. The length of all the legs are not equal	Group F

Starting from No.1 in the classification key above, identify the group that the animal shown below belongs to.



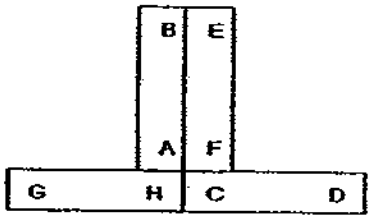
(1) Group B
(2) Group D
(3) Group E
(4) Group F

28. Reuben arranged four magnets with poles labelled A to H as shown below.

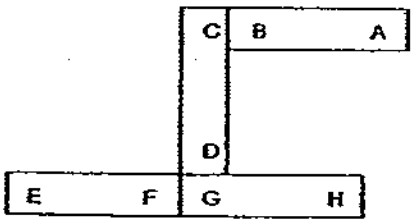


Which one of the following is another possible arrangement?

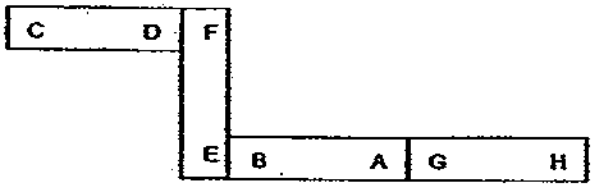
(1)



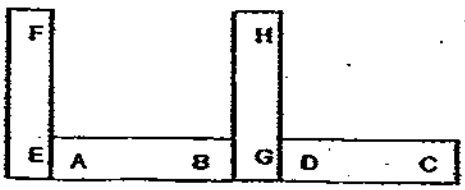
(2)



(3)

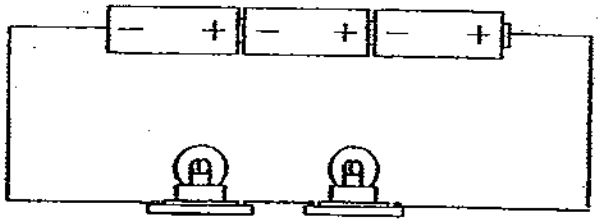


(4)

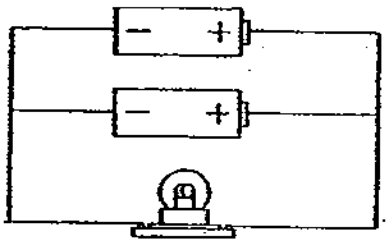


29. Study the electrical circuits below.

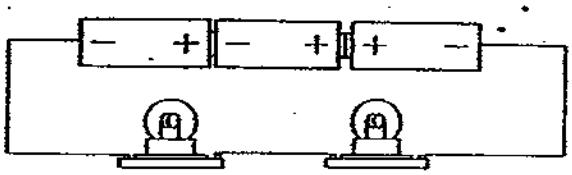
Circuit A



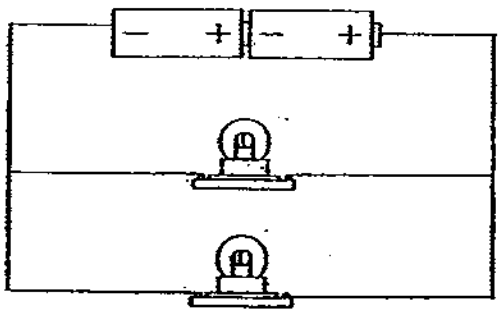
Circuit B



Circuit C



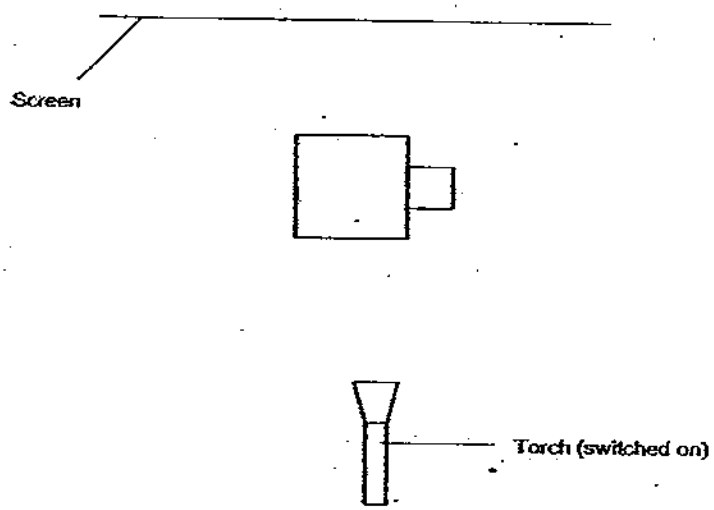
Circuit D



Arrange the circuits in descending order of the brightness of the bulb(s).

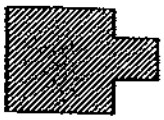
(1) A, D, B, C
(2) B, A, D, C
(3) C, B, A, D
(4) D, A, B, C

30. Ming Ming rested two objects on a table. She shone a torch at the objects and noted the shadow(s) formed. The diagram below shows her experimental set-up as seen from above.

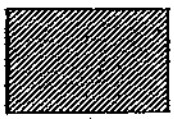


Which of the following could likely be the shadow cast by the two objects on the screen? (Not drawn to scale)

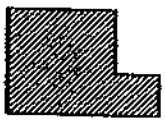
(A)



(B)



(C)



(D)

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

NANYANG PRIMARY SCHOOL

PRIMARY 6 SCIENCE

PRELIMINARY EXAMINATION 2009

BOOKLET B

Date : 27 August 2009

Duration : 1 h 45 min

Name : _____ **( )**

Class: Primary 6 ( )

Marks Scored:

Booklet A:	**60**
Booklet B :	**40**
Total :	**100**

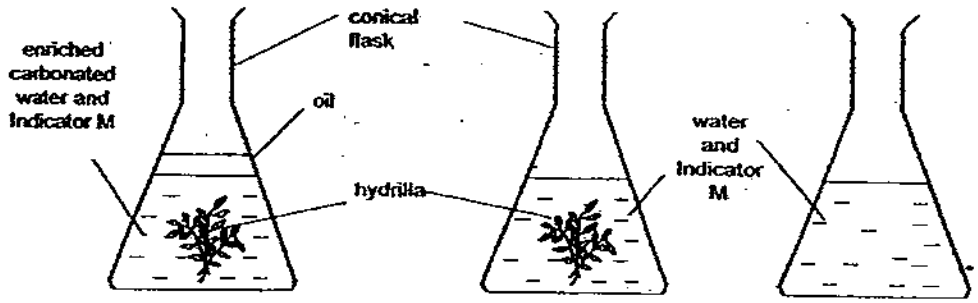
Parent's signature: _____

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.

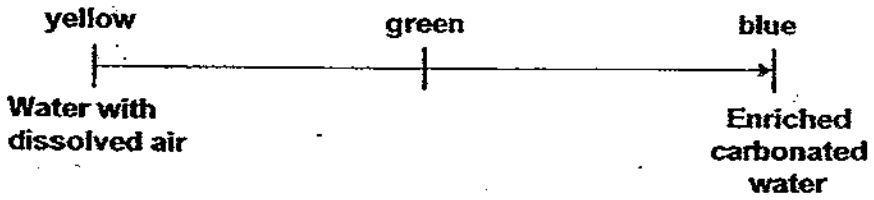
Section B (40 marks)
Write your answers to questions 31 to 46 in the spaces provided.
Marks will be deducted for misspelt key words.

31. Eric carried out an experiment on photosynthesis for 6 hours. He wanted to find out if enriched carbonated water would affect the rate of photosynthesis of hydrilla. Indicator M is a yellow liquid which will turn blue in the presence of increased carbon dioxide. In all set-ups, he added Indicator M.
The diagrams below show Eric's set-ups.



Set-up P Set-up Q Set-up R

Indicator M changes colour according to the amount of carbon dioxide in the solution as shown below.



(a) State the colour change of each set-up.(2 marks)

Set-up	Start of Experiment	End of Experiment
P	blue	
Q		
R	yellow	

(b) What is the purpose of set-up R? (1 mark)

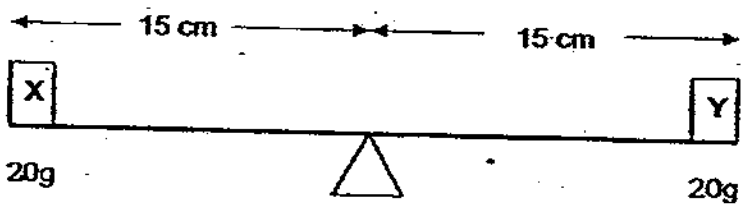
_____

31. (continue)

(c) Why did Eric add a layer of oil to Set-up P? (1 mark)

_____

32. Megan set up the experiment shown below using a lever and two identical 20g iron masses X and Y.



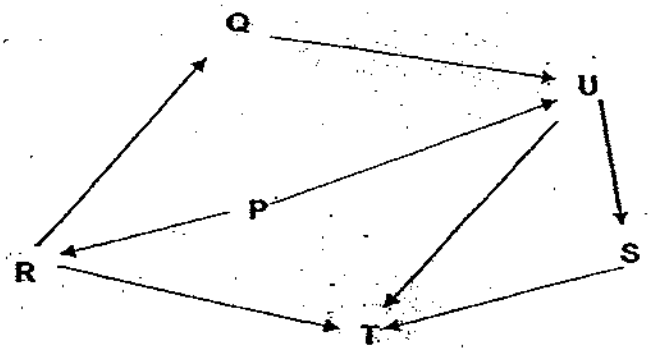
The lever was balanced in a horizontal position by X and Y. Mass X was then heated for 1 minute and Mass Y was not.
Explain whether the lever would stay in a horizontal position after Mass X was heated. (2 marks)

_____

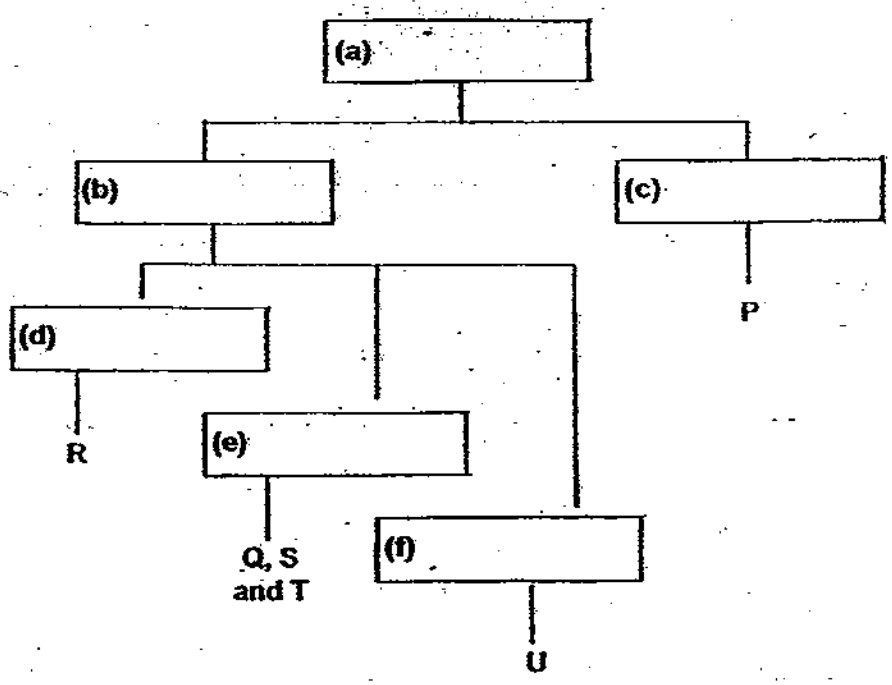
_____

_____

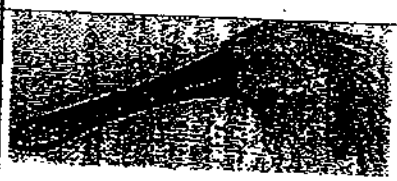
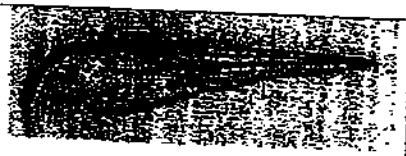
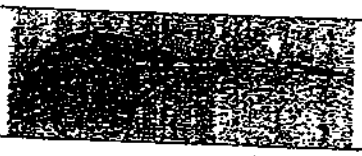
33. Study the food web below which consists of organisms P, Q, R, S, T and U.



Classify all the organisms of the food web in the classification chart below. Fill in the boxes (a) to (f) with suitable headings. (3 marks)



34. The table below describes how each bird uses its beak.

Bird		Description
Spoonbill		A spoonbill wades by the shore with its head underwater. It swings its head from side to side and scoops up tiny fish and other food from the mud and water into its mouth.
Heron		A heron also gets food in the water. It pierces fish, lifts them out of the water, and swallows them.
Parrot		A parrot can break open nuts and seeds easily with its big, strong bill.
Sparrow		A sparrow eats its finds on the ground. Its bill makes them easy to pick up.
Woodpecker		A woodpecker hammers its bill against a tree to make a hole in the bark. Then the woodpecker can eat the insects underneath.
Hummingbird		A hummingbird sticks its bill deep into a flower. Its long tongue sips up nectar.

(a) The beak of the birds work like tools we can find at home. Match the beak of each bird to the tools in the table below. (3 marks)

Birds	Tools
	Nutcracker
	Tweezers
	Straw
	Spear
	Chisel
	Shovel

34. (continue)

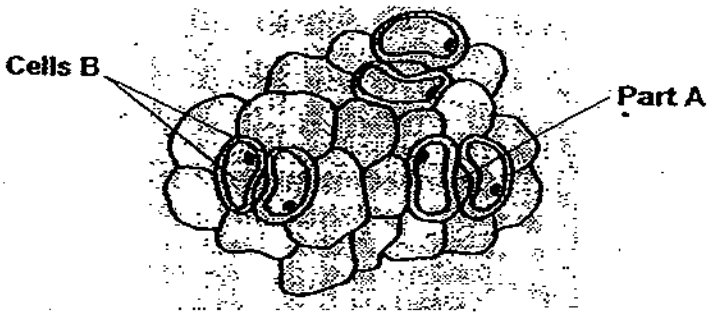
The owl and the eagle are birds of prey. They have similar adaptations to help them to catch their prey to obtain food.

(b) State and explain one common structural adaptation that both birds have to help them obtain their food. (1 mark)

_____

_____

35. In a Life Science laboratory class, Si Jie was given a specimen of plant cells. The diagram below shows the specimen under the microscope.



(a) Identify Part A and predict what will happen to it on a very hot day. (1 mark)

_____

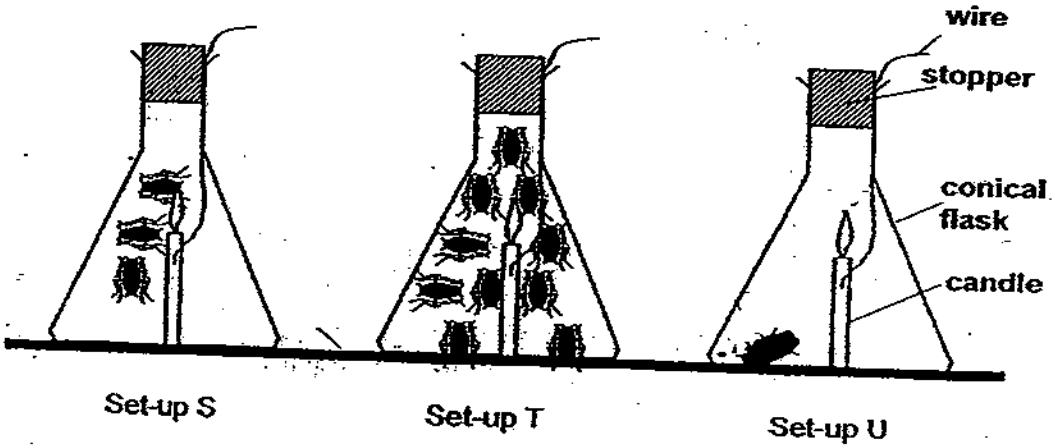
_____

(b) Explain the function of Cells B. (1 mark)

_____

_____

36. Mike set up an experiment as shown below. He placed 3 live cockroaches, 10 live cockroaches and a dead cockroach into the each of the conical flasks of set-ups S, T and U respectively. The dead cockroach in set-up U had been soaked in Formalin to prevent decay. Mike stoppered the flasks and left the set-ups for a few hours. After a few hours, he introduced a small lighted candle into each of the conical flasks as shown in the diagrams below. Immediately, after introducing the candles, the flasks were stoppered again. Mike recorded the time taken for the flame to go off in each set-up.



(a) Mike left the set-ups for a few hours before introducing the candles. Explain how this helped Mike to see greater differences in the results in the 3 flasks.
(1 mark)

_____

_____

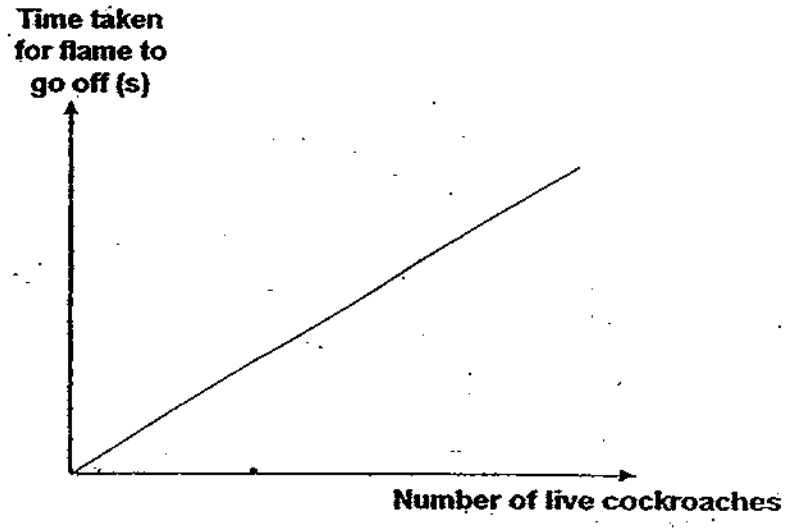
(b) What was the purpose of setting up Set-up U, which contained the dead cockroach?
(1 mark)

_____

_____

36. (continue)

(c) Draw a line graph to show the expected results of the experiment in the graph below. (1 mark)



37. Isabel wanted to test the effect of overcrowding on the growth of red bean seeds. She drew up a table as shown below before conducting the experiment.

Pot	Number of seeds	Amount of water used (ml)	Height of pots used (cm)	Amount of soil used (g)
A	5	Y	15	Z
B	X	7	15	350

(a) Write down the values represented by X, Y and Z for a fair test. (1 mark)

X - _____

Y - _____

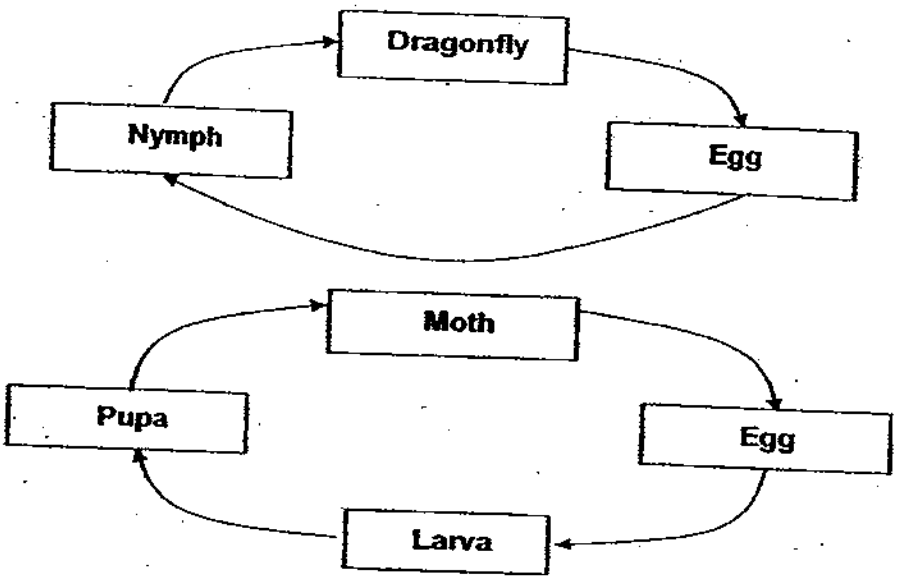
Z - _____

Her teacher told her one of the variables that she had included was not necessary for this experiment.

(b) Which one of the variable is not required in order for her to conduct a fair test? (1mark)

_____

38. Study the life cycles of the insects shown below.



State one similarity and one difference between the life cycles of these two insects. (2 marks)

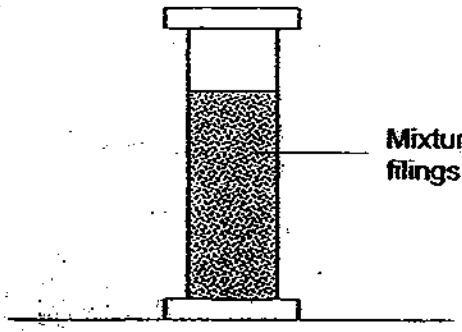
(i) Similarity: _____

_____

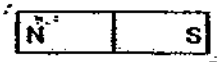
(ii) Difference : _____

_____

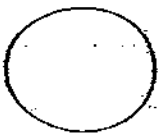
39. Adam wanted to obtain pure salt crystals from Mixture A below.



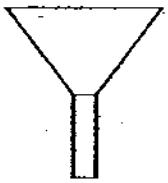
He was provided with the following materials.



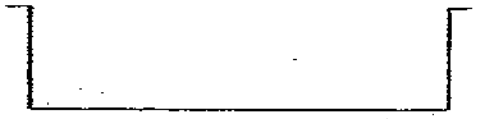
a bar magnet



a piece of filter paper



a funnel



a big basin

Using only the materials above, write down the three main steps he should carry out to obtain the pure salt crystals from Mixture A.

(2 marks)

(i) _____

_____

(ii) _____

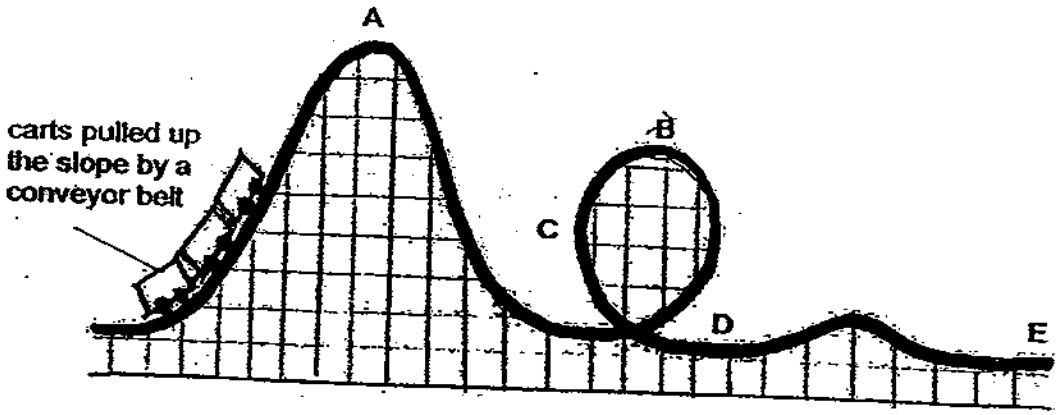
_____

(iii) _____

_____

(iv) Obtain salt in its solid state.

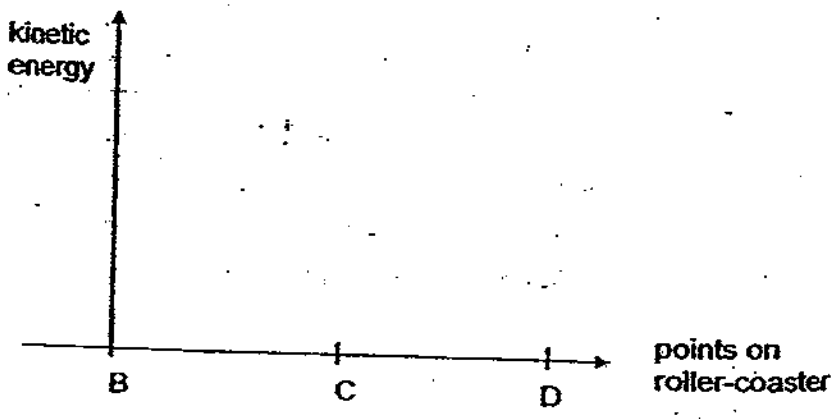
40 The diagram below shows a roller-coaster ride at an amusement park.



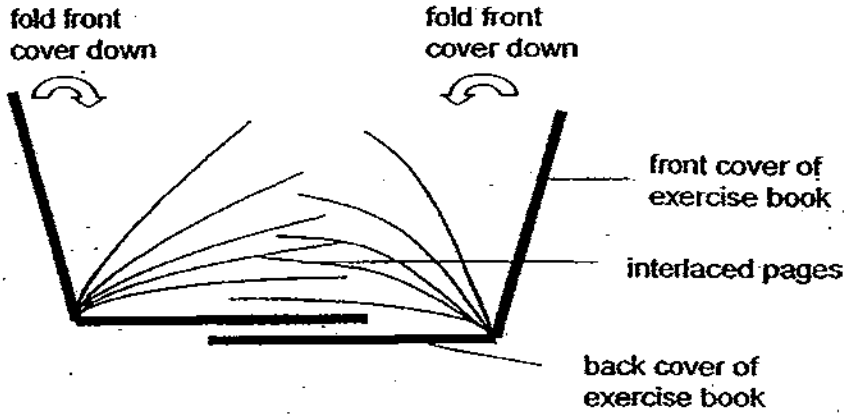
(a) Explain why the first hill (point A), must be the tallest part of the roller-coaster. (1 mark)

(b) Eventually, even without applying the brakes, the roller-coaster cart will come to a stop at point E. Explain why. (1 mark)

(c) In the graph below, draw a fine graph to show the conversion of kinetic energy of the cart as it goes through the loop (points B to D) in the roller-coaster ride. (1 mark)

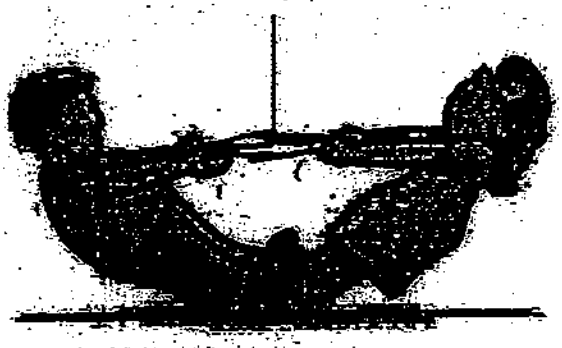


41. The diagram below shows how Derek and Diana interlaced two exercise books.



Then, they each took one end of the book and pulled hard.

interlaced exercise books



(a) State the force acting between the pages of the exercise book. (1 mark)

_____

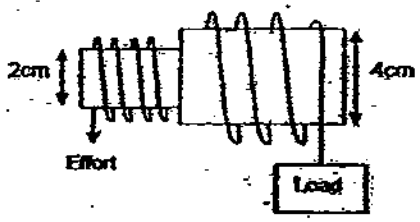
(b) Explain in terms of forces why the children were not able to separate the books by pulling. (1 mark)

_____

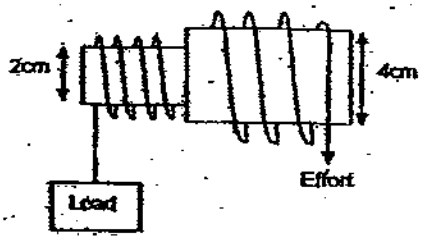
_____

_____

42. The diagrams below show two wheel and axle systems. Anna used one of the systems in an investigation to determine if the size of the wheel affected the effort required to lift a load.

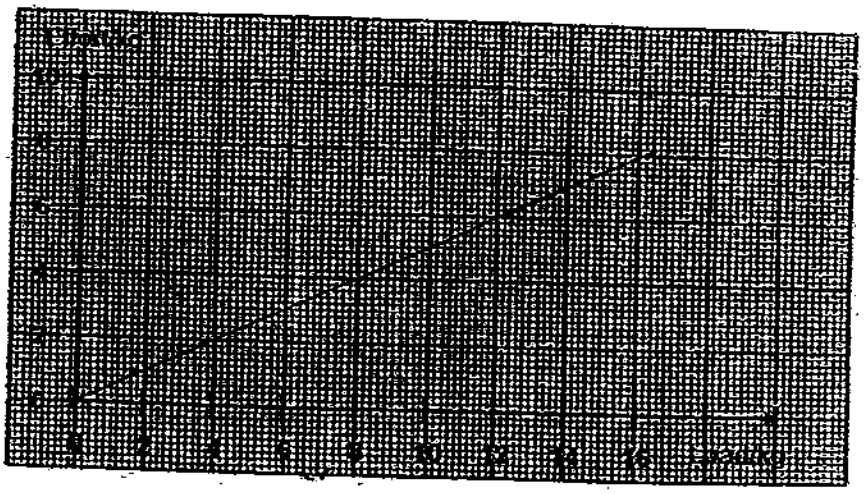


System A



System B

She plotted a graph of her results.



(a) Which wheel and axle system A or B, did Anna use? (1 mark)

_____

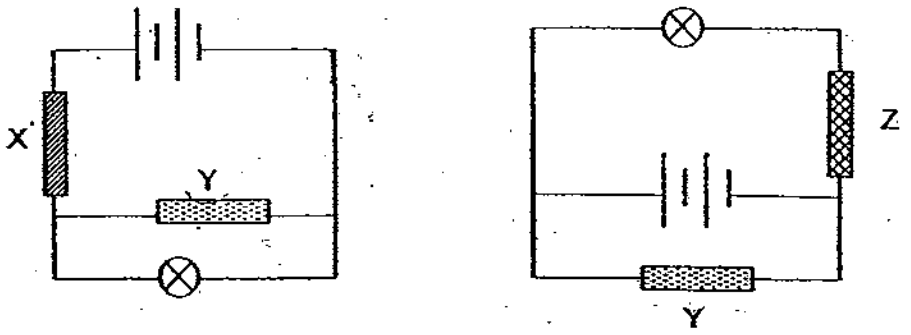
(b) Anna could not use the other wheel and axle system as the control in her experiment. Explain why. (1 mark)

_____

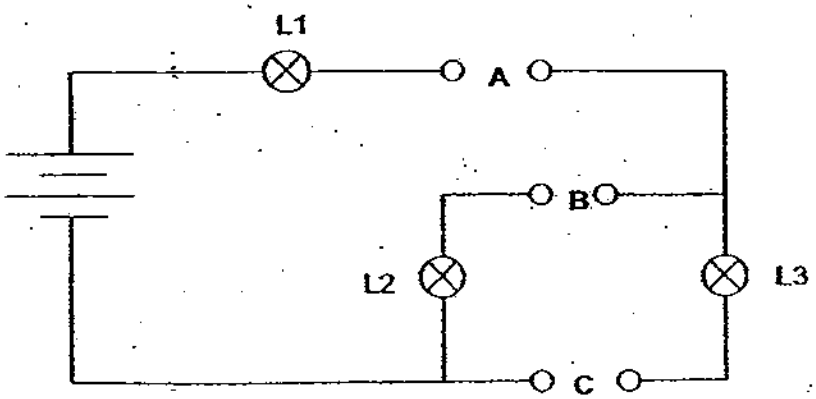
_____

_____

43. Three rods, X, Y and Z were placed in the 2 electrical circuits below. The bulbs in both the circuits lit up.



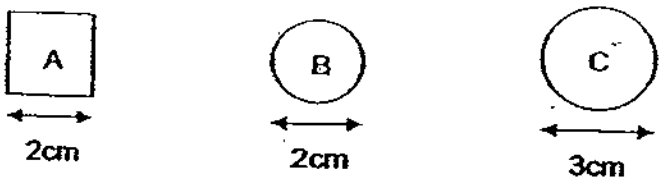
The rods were then used in another electrical circuit and placed at positions A, B and C.



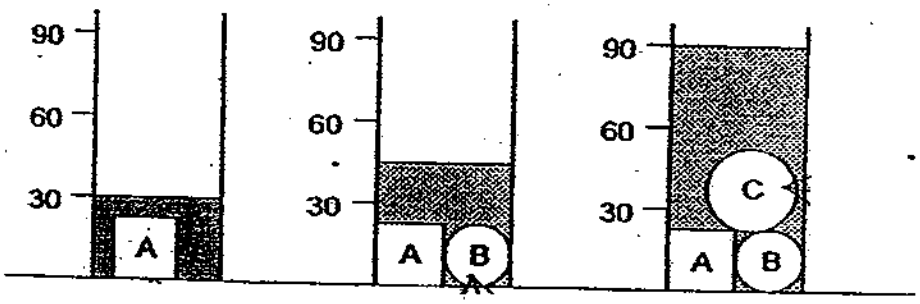
Based on the above circuit, complete the table below.
When any of the lamps L1, L2 or L3 lit up during the experiment, put a tick.(✓) in the appropriate box. (3 marks)

Positions where rods were placed			Lamp		
A	B	C	L1	L2	L3
X	Y	Z			
Y	Z	X			
Z	X	Y			

44. Ravi has 3 objects, A, B and C. They are made of different materials.



First, he puts A into a measuring cylinder containing 10ml of water. The water level rises. Then he puts object B into the same cylinder, followed by object C.

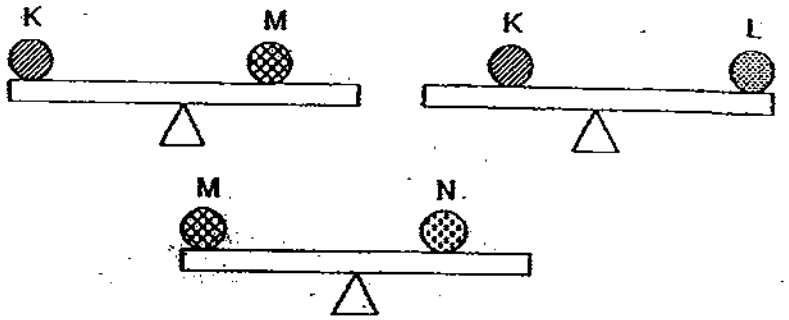


Based on the diagrams above, put a tick (✓) in the correct box for each of the statements in the table below. (1 mark)

	Statement	True	False	Not possible to tell
(a)	A occupies more space than B			
(b)	C has a greater mass than A			

44. (continued)

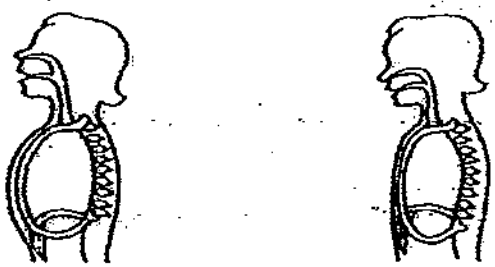
Ravi collected several more items K, L, M and N and balanced them on 3 different levers as shown below.



(c) Based on the diagram, arrange the items K, L, M and N according to their masses in ascending order. (1 mark)

_____

45. The diagram below shows how a person inhales and exhales.

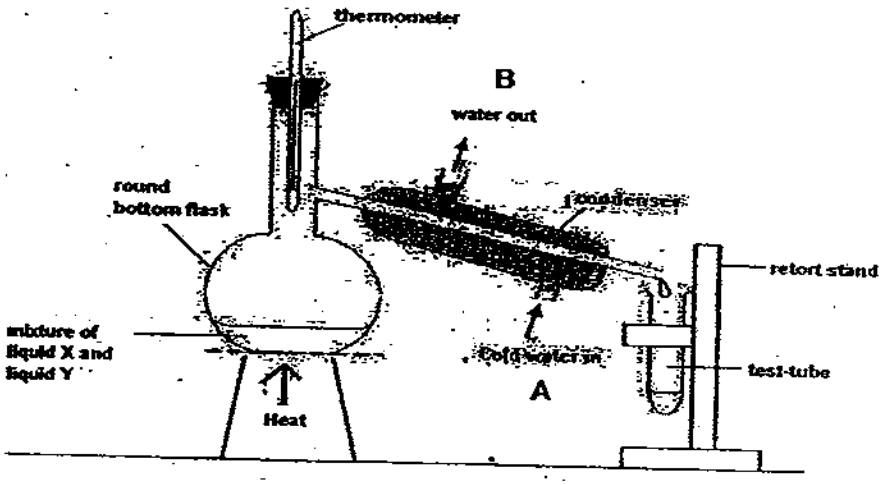


Inhale Exhale

The diaphragm and the ribcage work together in order for breathing to take place.
In the table below, circle the correct description of each structure when a person is taking a breath. (2 marks)

	Chest Cavity	Diaphragm	Ribcage
Inhale	bigger/ smaller	move upwards/ move downwards	move upwards/ move downwards
Exhale	bigger/ smaller	move upwards/ move downwards	move upwards/ move downwards

46. The diagram below shows a condenser which is used to separate a mixture of two liquids, X and Y, with different boiling points. The mixture is heated up and the vapour is then allowed to condense. The condensed liquid is collected in the test tube at the end.



The boiling points of X and Y are shown in the table below.

Liquid	Boiling Point (^{o}C)
X	80
Y	100

(a) Which liquid X or Y would be the first liquid to be collected in the test-tube? (1 mark)

_____

(b) Why must cold water be constantly pumped in at point A? (1 mark)

_____

_____

_____

END OF PAPER

Setters: Mrs Sherryl Toh
Mdm Chia Li Hoon

Answer Ke

EXAM PAPER 2009

SCHOOL : NANYANG PRIMARY
SUBJECT : PRIMARY 6 SCIENCE

TERM : SA2

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

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

31)a)P: green Q: yellow, yellow R: yellow
b)It is use as a control in the experiment to show the result is due to the hydrilla.
c)The layer of oil prevents carbon dioxide from escaping.

32)The layer would stay the balanced. Heat changes the volume but not the mass of X.

33)a)living things b)food consumers c)food produces
d)herbivoures e)carnivoures f)omnivoures

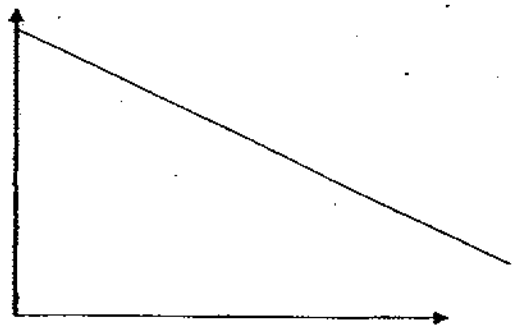
34)a)Parrot, Sparrow, Hummingbird, Heron, Woodpecker, Spoonbill
b)They have sharp and strong claws to grip firmly to its prey.

35)a)It would become smaller.
b)Cell B control the size of the stomata.

36)a)The cockroaches would give out carbon dioxide and after a few hours, there will be much carbon dioxide inside the flask and when Mike introduce the candle, he can immediately see the effect.

36)b)To act as a control to show that the result are due to live cockroaches respiring.

c)



37)a)X- 10 Y- 7 Z- 350

b)The height of pots used.

38)i)Both the dragonfly and moth lay eggs.

ii)The dragonfly has three life stages while the moth have life stages.

39)i)Use the magnet to attract the iron filings and take it out.

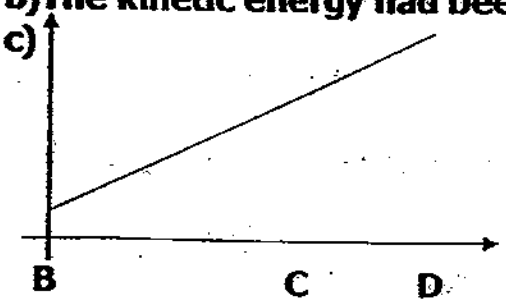
ii)Place the funnel on top at the piece of filter paper and the big basin under.

iii)Pour the remain ding of Mixture A into the fumel and the salt water will drop into the basin and let the water evaporate.

40)a)To gain the most gravitational potential energy to convert to the kinetic energy to complete the ride.

b)The kinetic energy had been converted to heat energy.

c)



41)a)Frictional force.

b)The friction between the pages of the books is greater than the pulling force.

42)a)system B.
b)Both the load and effort were placed at different at different positions.

43)

L1	L2	L3
√		√
√	√	

44)a)True b)Not c)L,K,M,N

45)

Chest Cavity	Diaphragm	Ribcage
bigger	move downwards	move upwards
smaller	move upwards	move downwards

46)a)Liquid X.
b)It is to make the condenser cold and allow the vapour to condense.