NANYANG PRIMARY SCHOOL

PRIMARY 6 SCIENCE

SEMESTRAL ASSESSMENT 1
2015

BOOKLET A

Date : 12 May 2015
Duration : 1 h 45 min

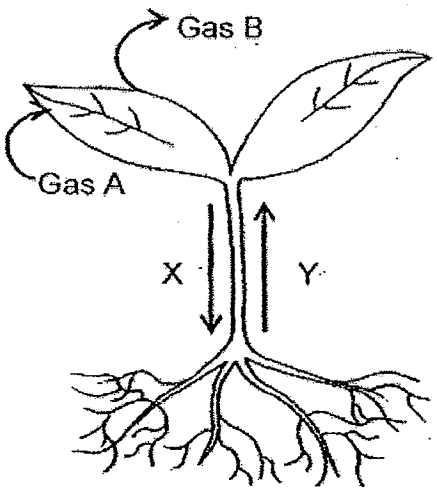
Section A (30 x 2 marks = 60 marks)
For each question from 1 to 30, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). **Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet provided.**

1. Which of the following **must** be present in order for photosynthesis to take place?

A Light
B Water
C Mineral salt
D Carbon dioxide

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

2. The diagram below shows two leaves which are undergoing the process of photosynthesis.



A and B represent the gases which are exchanged with the surrounding while X and Y represent substances moving to and from the leaves.

Which of the following correctly represent substances A, B, X and Y?

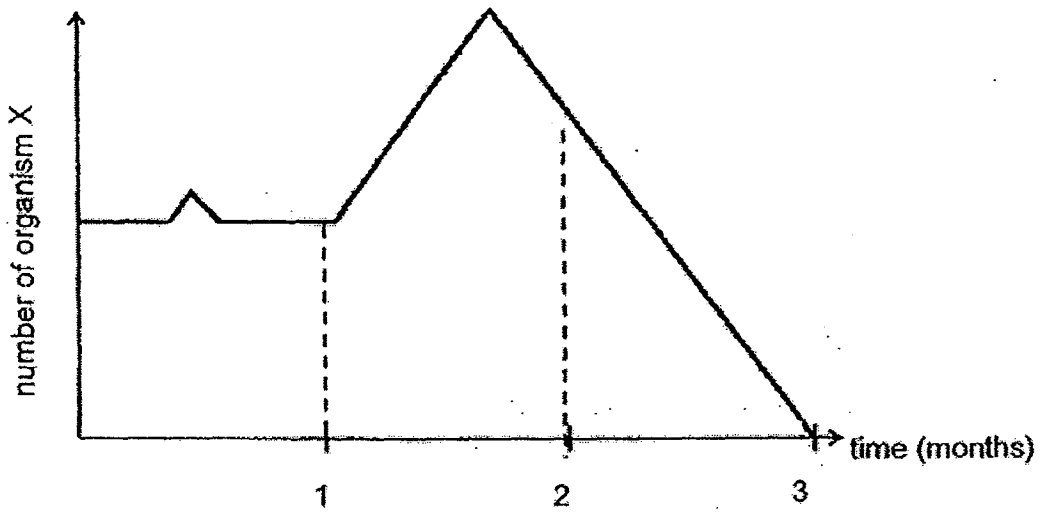
	A	B	X	Y
(1)	oxygen	carbon dioxide	water	starch
(2)	carbon dioxide	oxygen	starch	water
(3)	carbon dioxide	oxygen	sugar	water
(4)	oxygen	carbon dioxide	starch	water

3. Which of the following organisms get their energy directly from the sun?

A Grass
B Mushroom
C Coconut tree
D Bird's nest fern

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

4. The diagram below shows how the number of organism X changes over a period of 3 months.



Which of the following statements is **true** of organism X?

A The population size of X decreased to 0.
B The number of organism X increased and decreased each month.
C The smallest change in the population size occurred in the first month.

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

5. Karen wanted to carry out an experiment to find out which type of soil is more suitable for a plant. She was given 4 set-ups as shown in the table below.

Set-up	Type of soil	Amount of soil used for the experiment (g)	Arrangement of seedlings	Height of seedlings at the start of experiment (cm)
W	A	200	well-spaced	4
X	A	300	planted closely	6
Y	B	200	well-spaced	4
Z	B	300	well-spaced	4

Which two set-ups should Karen use to carry out her experiment?

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

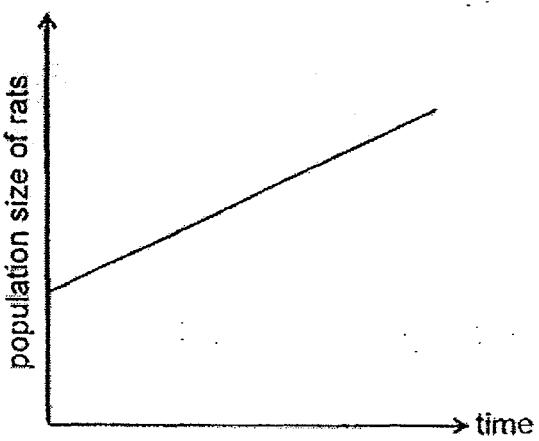
6. The table below shows some organisms that Isabel found in her garden.

Type of organism	Number of organism
Balsam plant	2
Caterpillar	2
Grasshopper	3
Bird	2
Snail	6
Ant	18
Bee	4
Butterfly	3
Worm	2

How many populations are there in the garden?

(1) 6
(2) 7
(3) 8
(4) 9

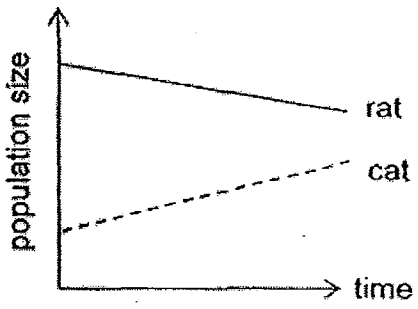
7. The graph below shows the population size of rats in a farm.



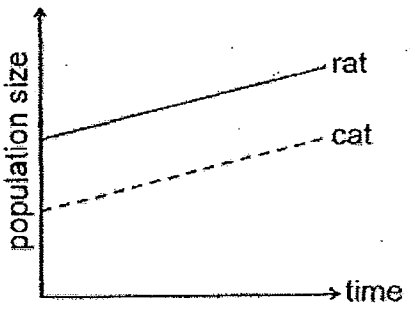
A farmer introduced a population of cats to his farm since they prey on rats.

Which one of the following graphs shows a possible change in both the population of the cats and the rats after the cats were introduced?

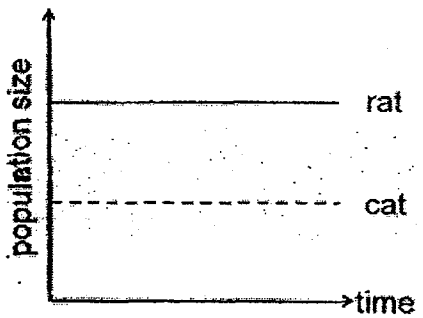
(1)



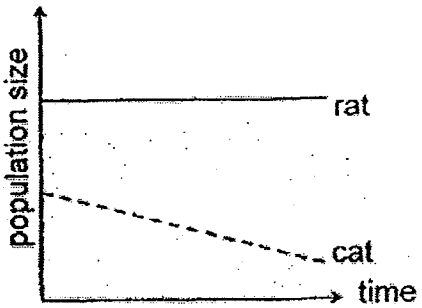
(2)



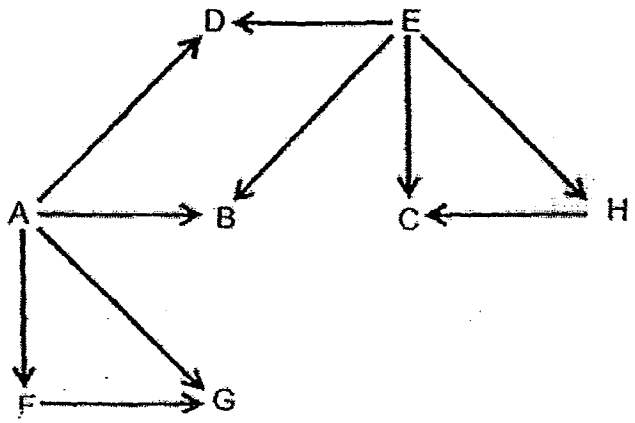
(3)



(4)



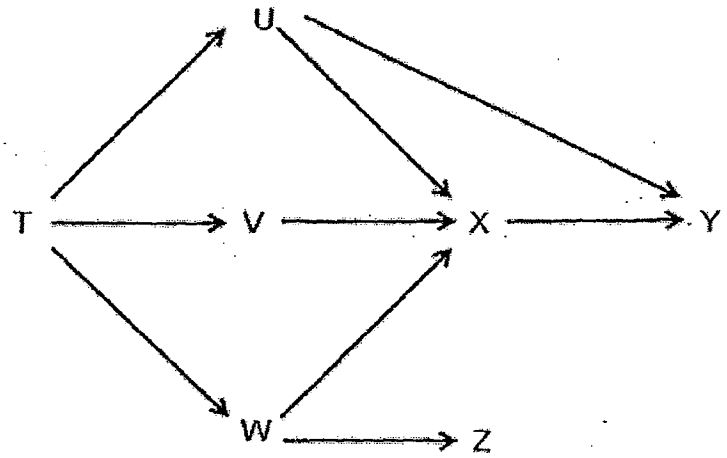
8. Study the food web as shown below.



Which of the organisms above feed on both plants and animals?

(1) B and D only
(2) C and G only
(3) F and H only
(4) B, C and G only

Study the food web below and answer questions 9 and 10.



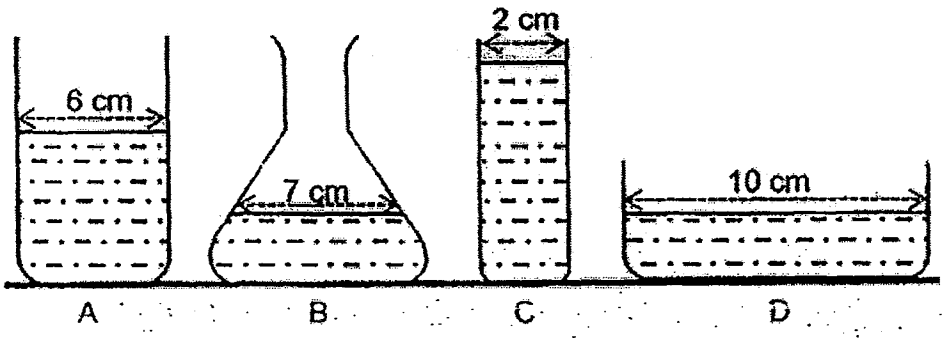
9. How many food chains are there in the food web above?

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

10. The following changes will either have a direct or indirect impact on organism Z. Which of the following changes will have a **direct** and **immediate** impact on organism Z?

(1) An increase in the reproduction of V.
(2) A disease outbreak reducing population Y.
(3) An increase in the hunting for organism W.
(4) A prolonged period of drought affecting population T .

11. Jason poured 200ml of water at room temperature into each of the four different containers as shown in the diagram below. He left the 4 containers under direct sunlight.

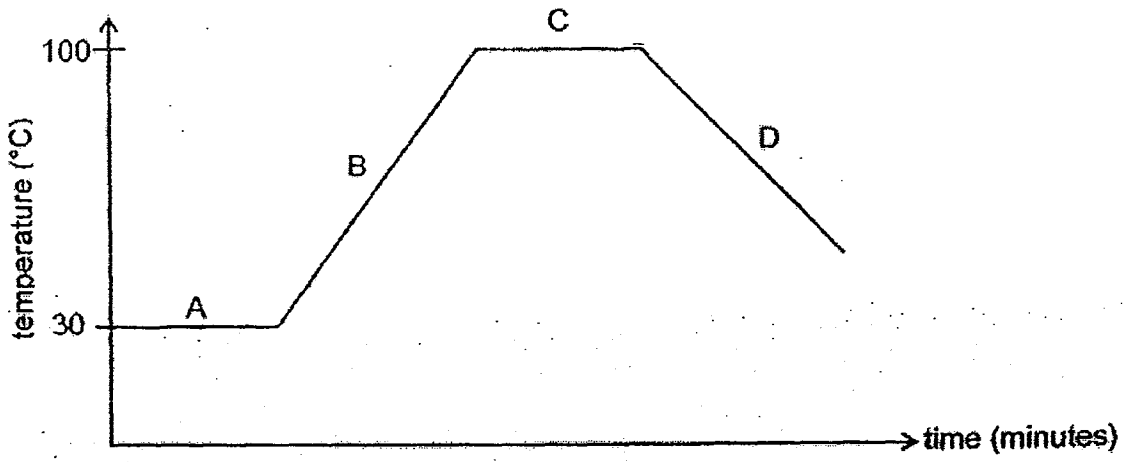


Jason measured the amount of water left in the containers after two hours.

Which of the following correctly shows the amount of water left in the containers after an hour, beginning with the container with the most amount of water to the container with the least amount of water?

	most →			least
(1)	B	D	A	C
(2)	C	A	B	D
(3)	C	B	A	D
(4)	D	A	B	C

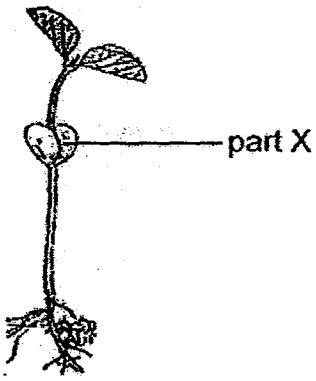
12. The graph below shows the change in the temperature of water over a period of time.



Which part of the graph A, B, C or D shows that the water is gaining heat?

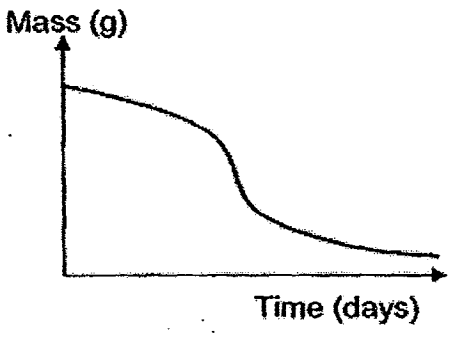
(1) D only
(2) A and C only
(3) B and C only
(4) B and D only

13. Study the diagram of a seedling below.

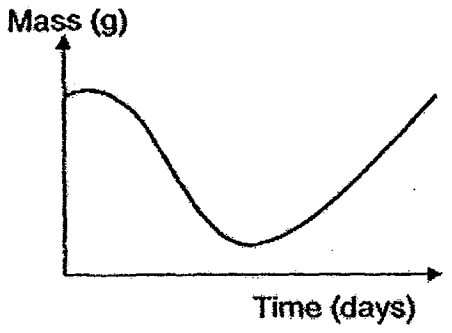


Which one of the following graphs correctly shows the mass of part X during the growth of the seedling?

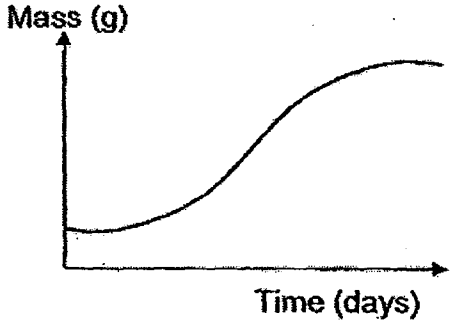
(1)



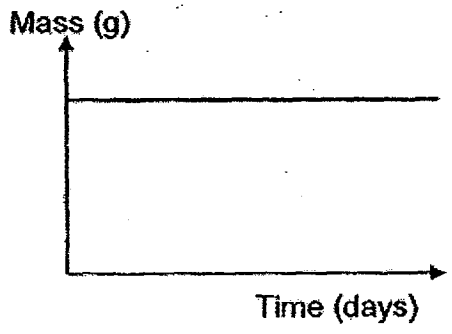
(2)



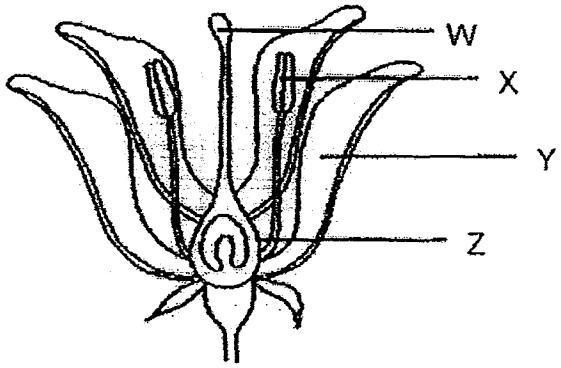
(3)



(4)



14. The diagram below shows the cross-section of flower A.

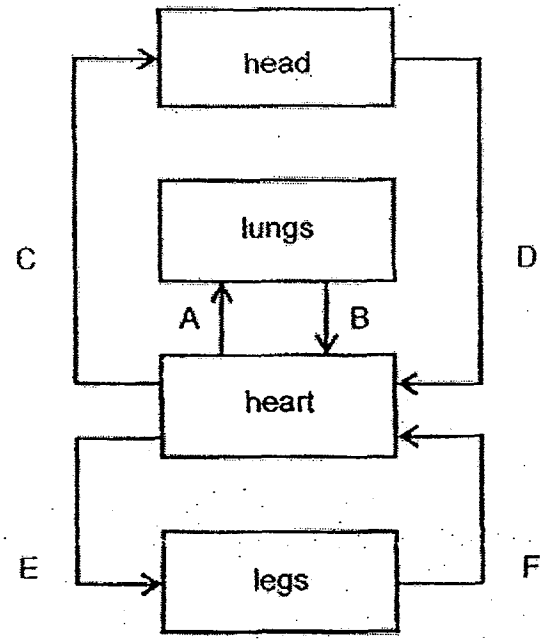


Based on the diagram above, which of the following statement(s) is/are **true**?

A Parts W and Y attract insects to flower A.
B Part X will wither and drop off after fertilisation.
C Part Z will develop into a seed after fertilisation.

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

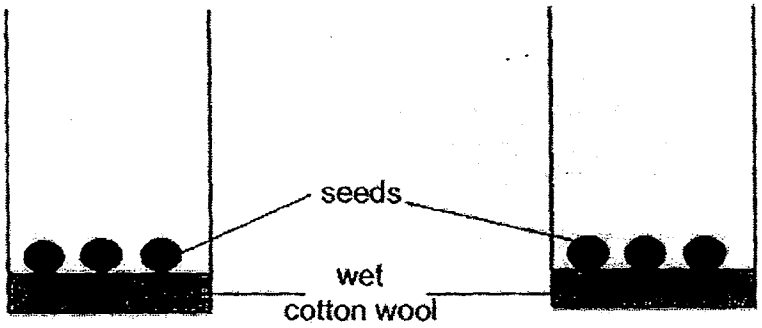
15. The diagram below represents the blood flow in some parts of the human body.



Which of the following arrows carry blood that is richer in oxygen than carbon dioxide?

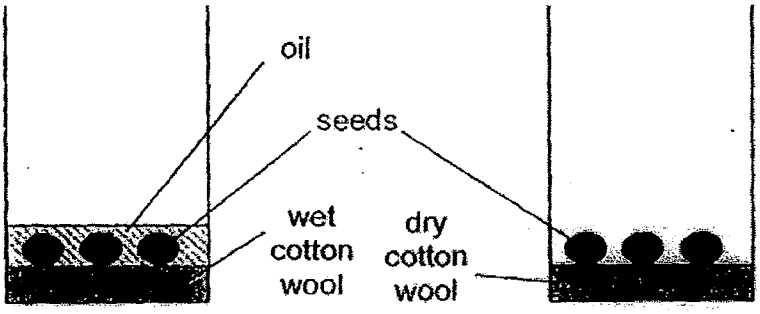
(1) A,C and E only
(2) B, C and E only
(3) B, D and E only
(4) A, B, C and D only

16. Jane prepared 4 set-ups, A, B, C, D, as shown below.



Set-up A
Placed near a window

Set-up B
Placed in a freezer



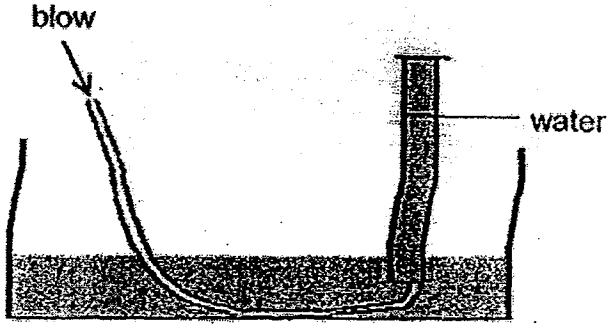
Set-up C
Placed near a window

Set-up D
Placed near a window

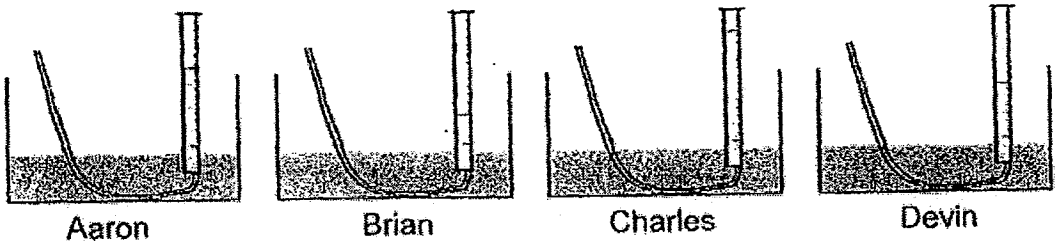
Which set-ups above should she use to find out if oxygen and water are needed for germination?

	Factors for germination	
	Oxygen	Water
(1)	Set-ups A and D	Set-ups A and B
(2)	Set-ups B and C	Set-ups C and D
(3)	Set-ups A and C	Set-ups A and D
(4)	Set-ups C and D	Set-ups B and C

17. Four boys, Aaron, Brian, Charles and Devin, were asked to take one deep breath before blowing into a set-up as shown in the diagram below.



The results for each of them were shown below.

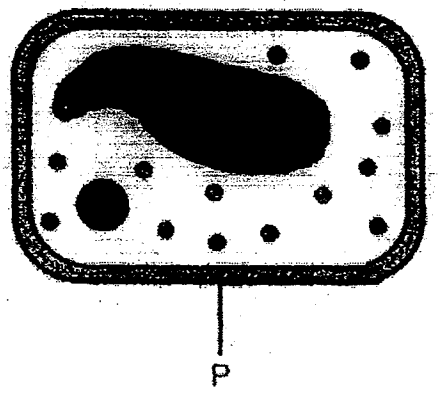


The boys were then told to inflate a balloon to a particular size and the number of deep breaths they took to inflate the balloon was recorded.

Based on the results from the set-ups above, arrange in order, starting with the boy who would take the least number of breaths to the boy who would take the most number of breaths to inflate the balloon.

	least → most			
(1)	Aaron	Charles	Brian	Devin
(2)	Brian	Devin	Aaron	Charles
(3)	Brian	Aaron	Devin	Charles
(4)	Devin	Aaron	Charles	Brian

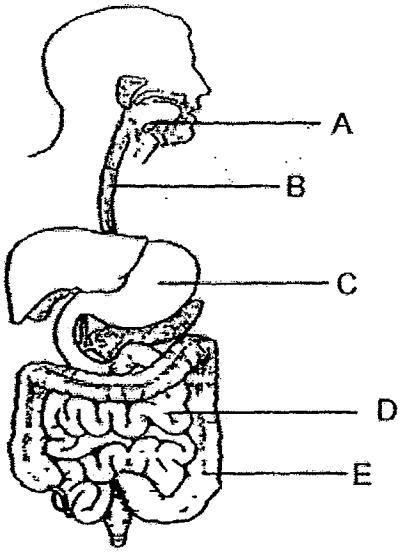
18. The diagram below represents the cell of a green plant.



What is the main function of part P?

(1) It traps sunlight.
(2) It gives the cell a regular shape.
(3) It controls all activities within the cell.
(4) It controls substances entering the cell.

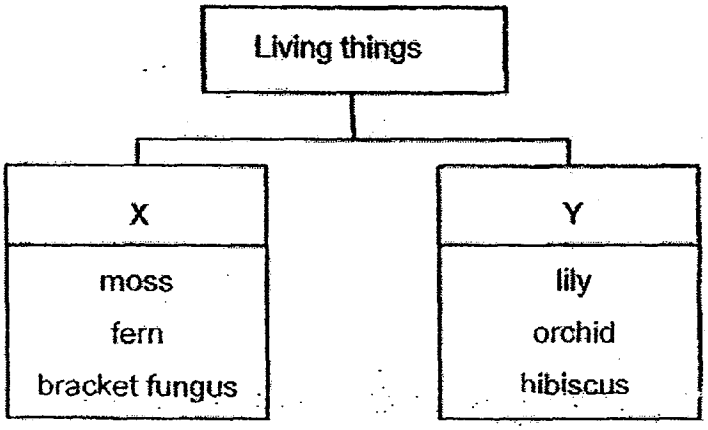
19. The diagram below shows the human digestive system.



Which one of the following represents the change in the amount of digested food as it passes parts A, B, C, D and E?

	A	B	C	D	E
(1)	increases	increases	increases	increases	increases
(2)	increases	no change	increases	increases	no change
(3)	no change	no change	increases	increases	increases
(4)	increases	no change	decreases	decreases	no change

20. The chart below shows how some living things can be grouped.

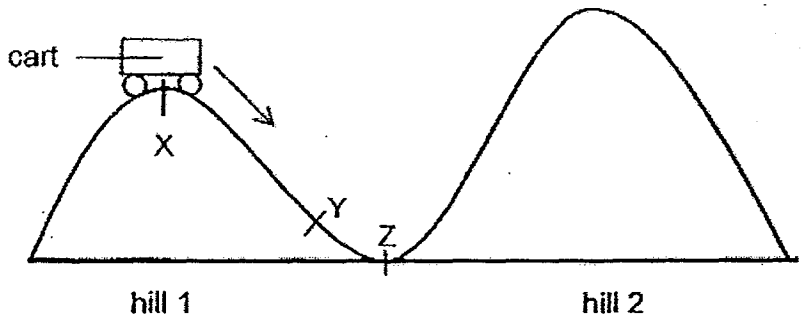


Which of the following statements **correctly** describe the living things in the chart above?

A Living things in group Y can bear fruits.
B Living things in group X reproduce by spores.
C Living things in group Y can make their own food.
D Living things in group X cannot make their own food.

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

21. The diagram below shows a cart being released from the top of hill 1.

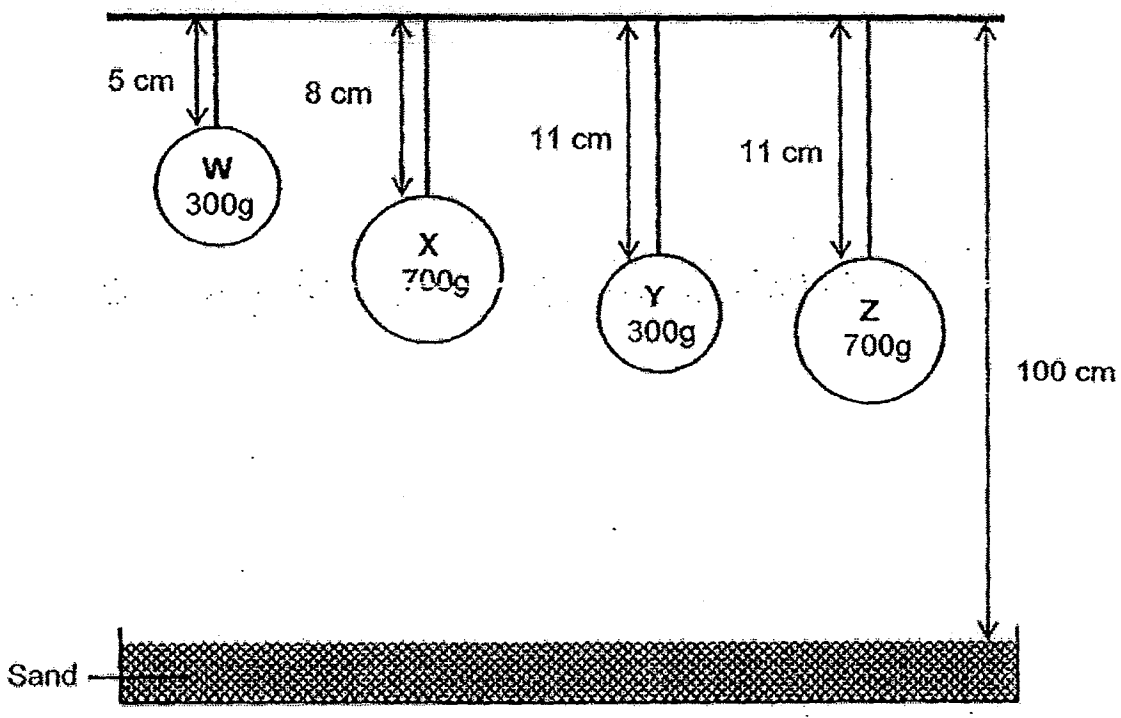


Which of the following statements **correctly** describe the energy possessed by the cart A?

A The cart has the most kinetic energy at point Z.
B The cart has enough energy to go over hill 2.
C The cart has more gravitational potential energy at point X than at point Z.
D The cart has more kinetic energy than gravitational potential energy at point Y.

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

22. John set up an experiment using strings and balls of different masses as shown in the diagram below. When the strings were released, the balls dropped and created dents in the tray of sand. (The diagram below is not drawn to scale.)

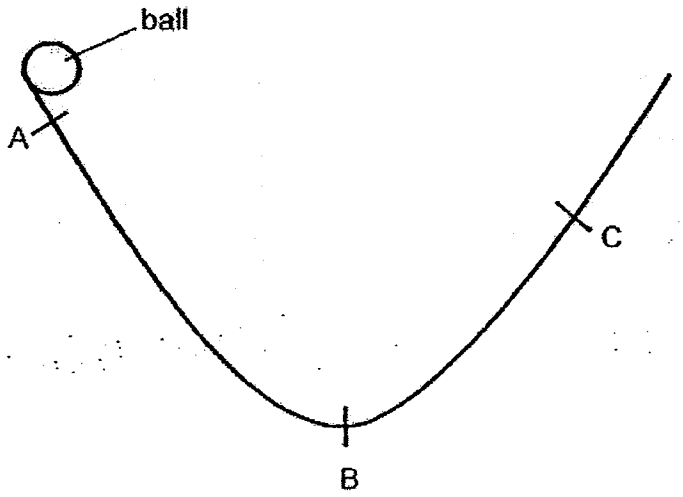


Based on the information above, which of the following statements are **correct**?

A Ball W will hit the sand at a higher speed than ball Y.
B Ball X has more gravitational potential energy than ball Z.
C Ball Y has more kinetic energy than ball Z just before hitting the sand.
D All the balls have the same amount of kinetic energy before the string was released.

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

23. Daniel released a ball at point A on the track as shown in the diagram below.



Which of the following **correctly** shows the energy conversion from point **B** to point **C**?

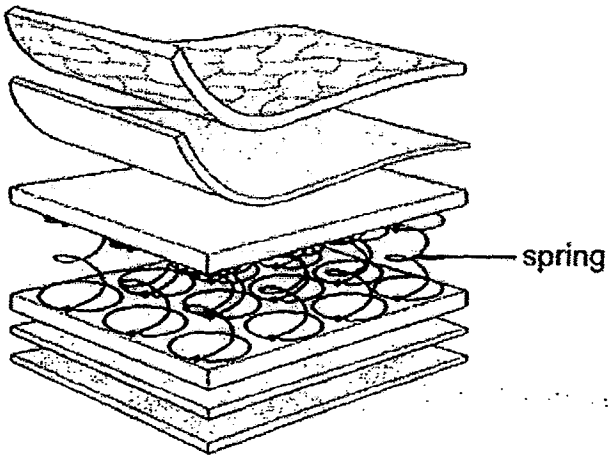
(1) kinetic energy → chemical potential energy + heat energy + sound energy

(2) kinetic energy → gravitational potential energy + heat energy + sound energy

(3) gravitational potential energy → kinetic energy + heat energy + sound energy

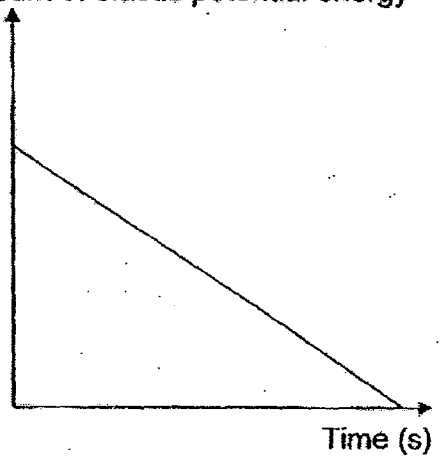
(4) gravitational potential energy → kinetic energy + heat energy + sound energy + light energy

24. The diagram below shows the cross section of a mattress.

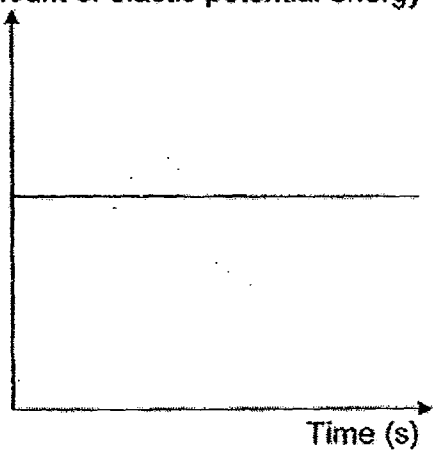


John dropped a bowling ball on the mattress. It bounced a few times before it stopped. Which one of the following graphs correctly shows the amount of elastic potential energy of the springs in the mattress as time passed?

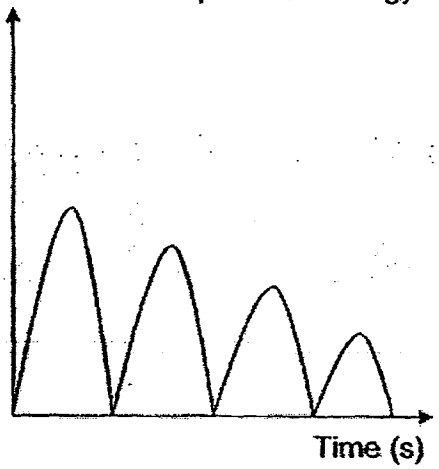
(1) Amount of elastic potential energy



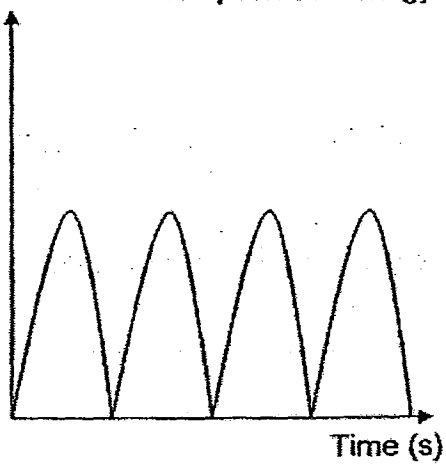
(2) Amount of elastic potential energy



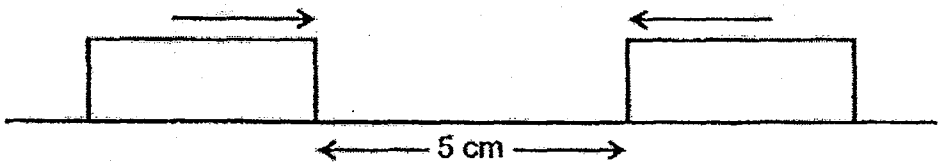
(3) Amount of elastic potential energy



(4) Amount of elastic potential energy

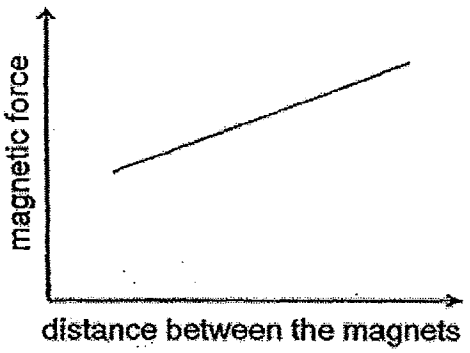


25. Jason set up the experiment below to investigate the relationship between the magnetic force and the distance between 2 magnets. The two bar magnets were placed 5 cm apart and brought towards each other until they were 1 cm apart.

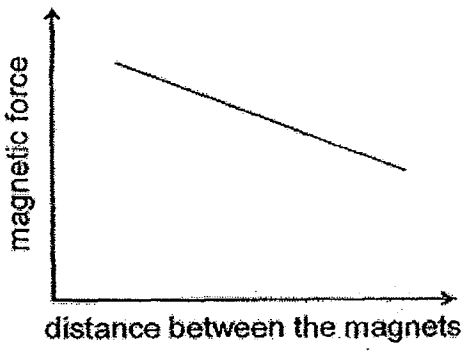


Which one of the following graphs correctly shows how the magnetic forces vary with the distance between the two magnets?

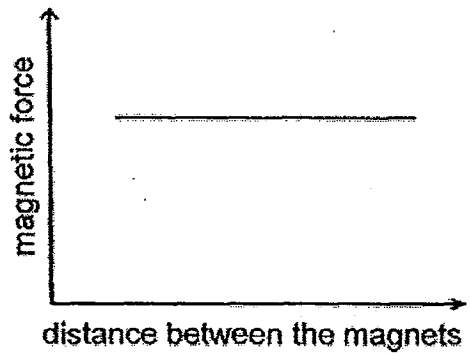
(1)



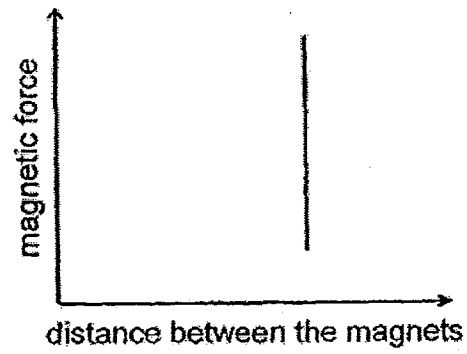
(2)



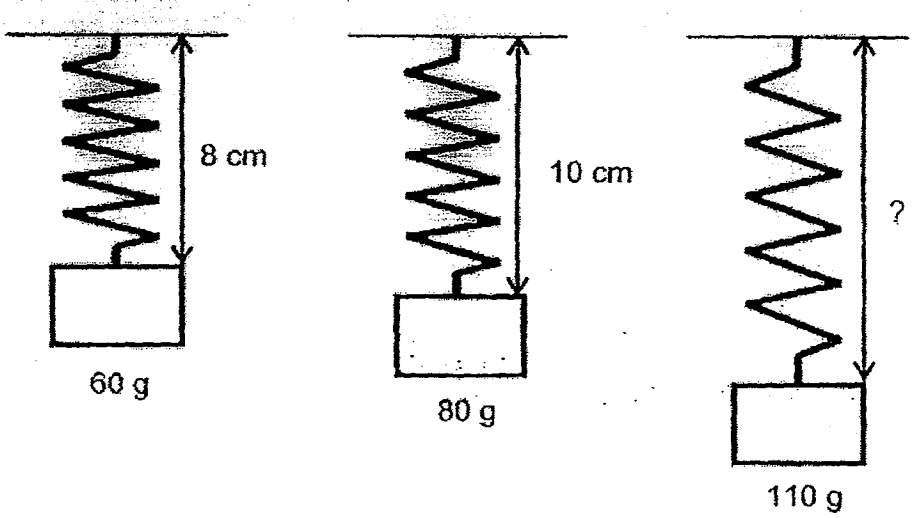
(3)



(4)



26. The diagram below shows the length of a spring when different loads were hung onto it. The spring returned to its original length each time a load was removed from it.



What was the length of the spring when a mass of 110 g was hung onto it?

(1) 11 (2) 12
(3) 13 (4) 14

27. Sarah recorded the time taken for the water to boil when placed in containers of different materials, ~~X, Y and Z,~~ A, B and C in the table shown below.

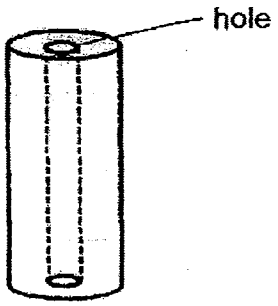
Material	Time taken for water to start boiling (min)
A	10
B	15
C	20

She wanted to create 2 separate containers, one to keep food hot and another one to keep drinks cold.

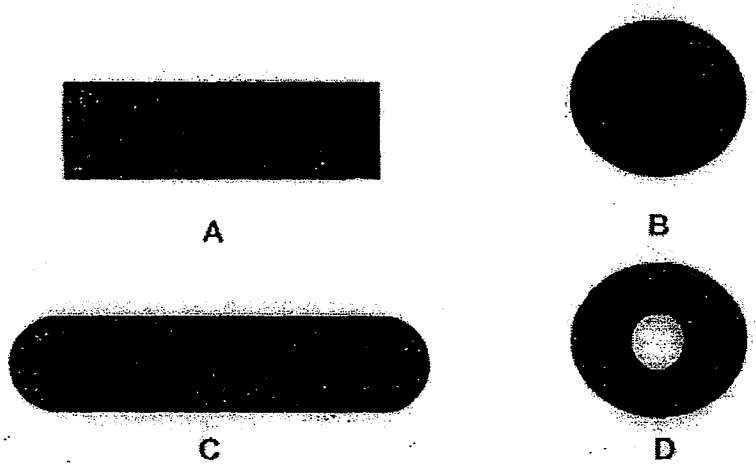
Which material would be the most suitable for making each container?

	Material of container	
	Keep food hot	Keep drinks cold
(1)	A	B
(2)	C	A
(3)	A	A
(4)	C	C

28. Peter carried out an experiment to investigate the shadows formed by the metal rod as shown below.

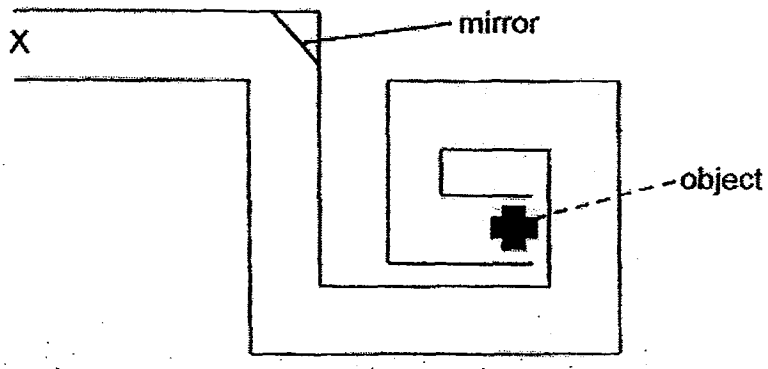


Which of the following are possible shadows that can be cast by the metal rod?



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

29. James was standing at the entrance of a maze at point X. There is already 1 mirror in the maze as shown below.



Top view of the maze

What is the **least number of mirrors that needs to be added** for James to be able to see the object **from where he is standing**?

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

30. The table below shows the states of four substances, E, F, G and H, at different temperatures.

Substances	States of substances		
	8°C	46°C	83°C
E	solid	liquid	gas
F	liquid	liquid	liquid
G	liquid	gas	gas
H	solid	solid	liquid

Which of the following statements **correctly** describe substances E, F, G and H?

A The boiling point of substance E is 84°C.
B The melting point of substance F is 15°C.
C Substance G has the lowest boiling point.
D Substance H has the highest melting point.

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

NANYANG PRIMARY SCHOOL

PRIMARY 6 SCIENCE

SEMESTRAL ASSESSMENT 1
2015

BOOKLET B

Date : 12 May 2015

Duration : 1 h 45 min

Name : _____ ( )

Class: Primary 6 ( )

Section B (40 marks)
Write your answers to questions 31 to 44 in the spaces provided.

31. Mason used 3 similar plants as shown in the diagram below to carry out his experiment.

Plant A (watered with sea water)

Plant B (watered with river water)

Plant C (watered with tap water)

He used seawater, river water and tap water to water the respective plants and placed them in the garden. He then recorded the height of the plants at the end of each week in the table below.

	Height of plant A (cm)	Height of plant B (cm)	Height of plant C (cm)
Week 1	7	7	7
Week 2	3	9	8
Week 3	1	11	9
Week 4	1	13	10

(a) What is the aim of Mason's experiment? [1]

(b) State one variable that had to be kept constant when Mason carried out the experiment. [1]

32. Michael was asked to set up an experiment to find out if large amount of duckweeds affect plants that grow at the bottom of the pond. Duckweeds are plants that float on the surface of the pond while hydrillas grow at the bottom of the pond. Michael was given the following items to use in his experiment.

- Duckweeds
- Hydrillas
- Soil
- 2 metal containers
- Pond water

(a) List down the steps that Michael has to take to carry out his experiment. (You have to use all the given items.) [2]

Step 1	Fill up each metal container with equal amount of soil. Plant 5 hydrillas into each container of soil.
Step 2	
Step 3	
Step 4	Record the number of hydrillas that are alive in each container after 1 month.

(b) Explain why a metal container should be used instead of a glass beaker to carry out the experiment. [1]

33. In the space provided below, construct a food web based on the information given. [3]

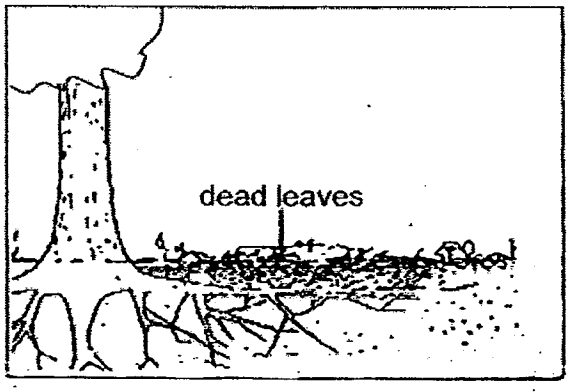
- C feeds on B.
- A feeds on B.
- D feeds on B and A.
- A and D are eaten by E.

(a)

C A

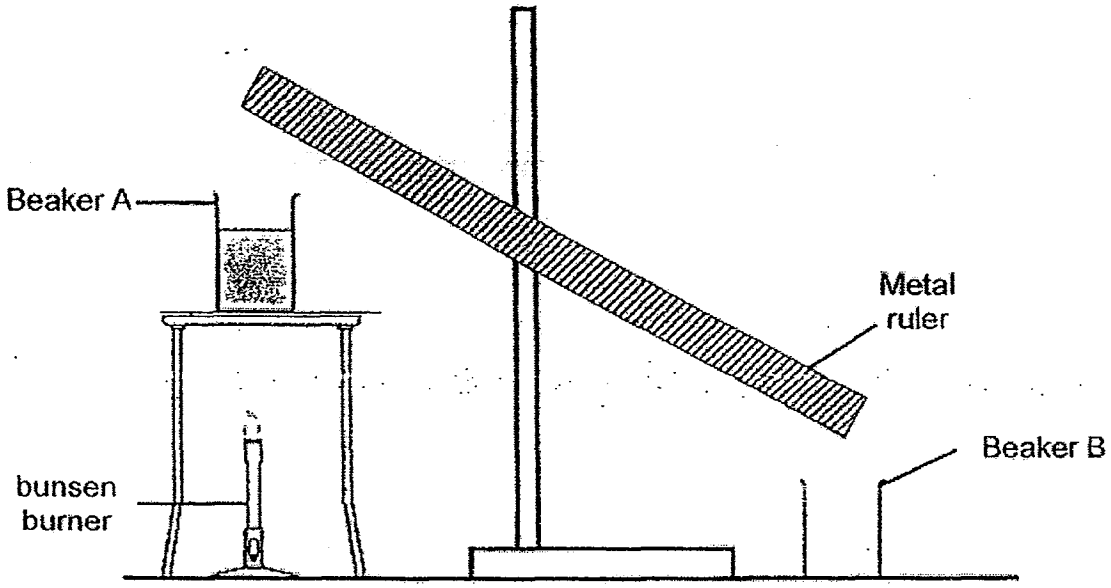
B

The gardener at Amy's house would often sweep the fallen leaves into a pile underneath the tree as shown in the figure below.



(b) Suggest how the presence of the dead leaves may be helpful to the tree. [1]

34. Christopher was able to transfer water from beaker A to beaker B using the set-up below. Beaker A contained 50 ml of water initially.



(a) Based on the set-up above, explain how the water was transferred from beaker A to beaker B. [2]

(b) After some time, beaker A was empty but there was only 35 ml of water in beaker B. Explain this observation. [1]

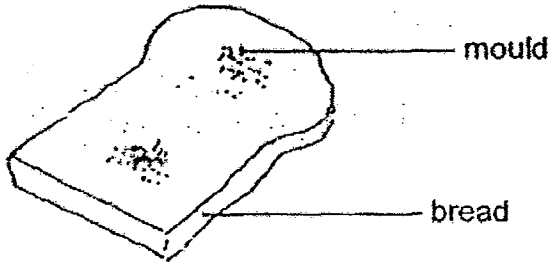
(c) Suggest **two** changes that would allow Christopher to transfer the water to beaker B in a **shorter** time. [1]

i)

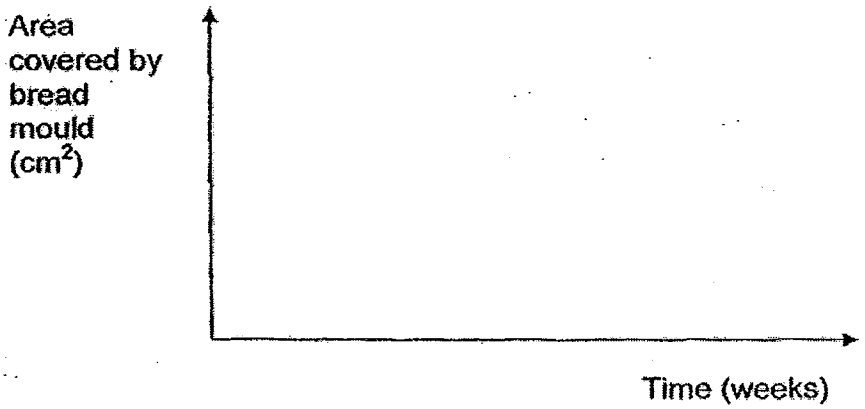
ii)

35. (a) State a similarity in how ferns and moulds reproduce. [1]

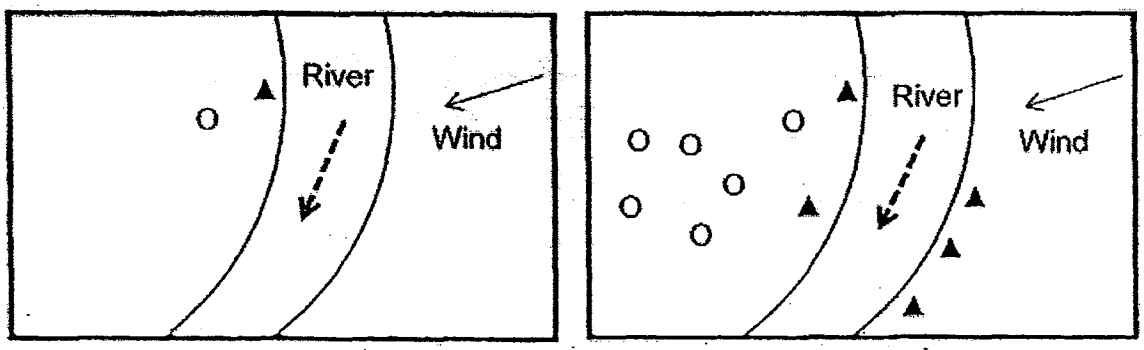
(b) A piece of bread with some mould growing on it was kept in a dark room for a few weeks.



Draw on the graph below, how the area covered by the bread moulds will change over time. [1]



36. The following diagrams represent the distribution of 2 types of plants, X and Y, in an unknown location.



Year 2009 Year 2012

Key
Plant X: O
Plant Y: ▲
Flow of river: ----->
Direction of wind: ——→

(a) Based on the diagrams above, state the most likely dispersal method and physical characteristics of the fruits of plants X and Y. [2]

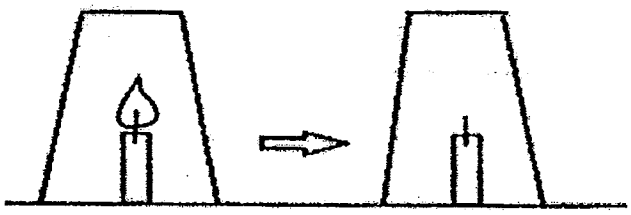
Plant	Dispersal method	Physical characteristics
X		
Y		

(b) Explain why seeds need to be dispersed further away from the parent plants as shown above. [1]

_____

_____

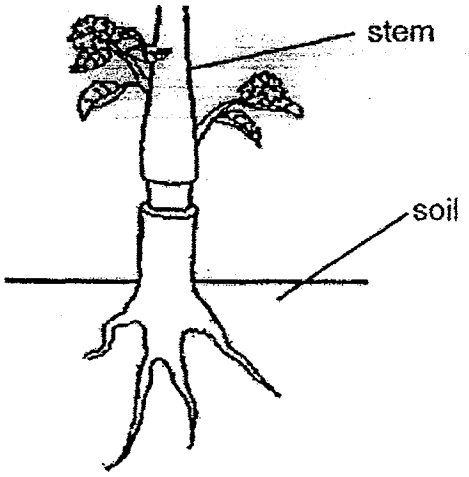
37. Tommy placed a cup over a burning candle as shown below. He observed that the candle stopped burning after sometime.



(a) Explain why the candle stopped burning. [1]

(b) When a person was trapped in a tightly shut lift, it was observed that his breathing rate increased. Explain why this change happened. [2]

38. Naomi removed a section from the stem of a plant which contained the food-carrying tubes as shown in the diagram below.

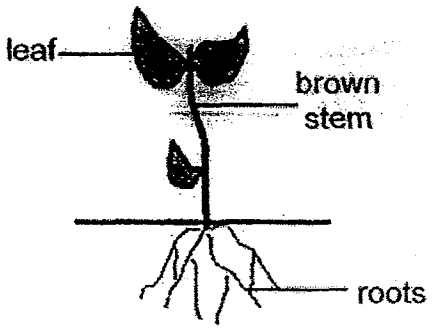


A few days later, Naomi noticed that a section of the stem had swelled up.

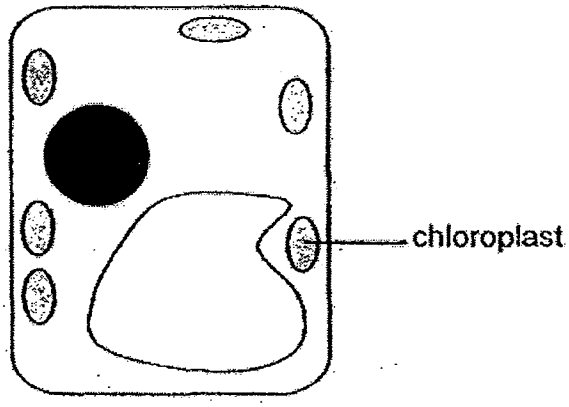
(a) In the diagram above, **mark an "X"** to indicate where Naomi was most likely to observe the swell. [1]

(b) Explain why the plant died after 3 weeks. [1]

39. The diagram below shows a plant. A cell was taken from a specific part of the plant.



plant



cell from plant (enlarged view)

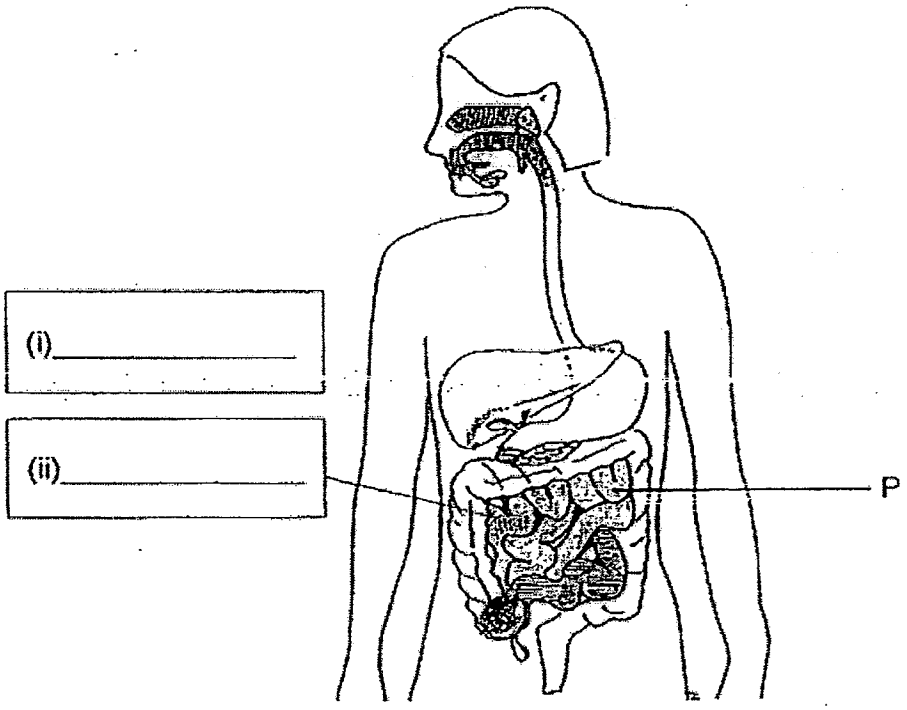
(a) Which part of the plant was the cell most likely to be taken from? Explain your answer. [1]

_____

_____

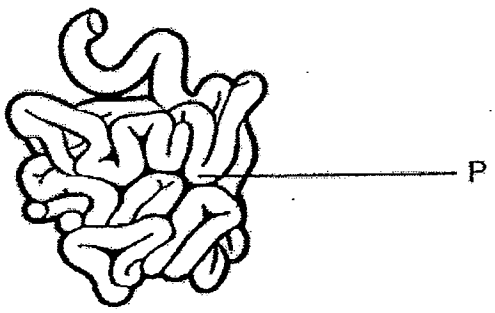
(b) In the diagram above, name and label the part of the plant cell which controls all activities in the plant cell. [1]

40. The diagram below shows the digestive system of a human.



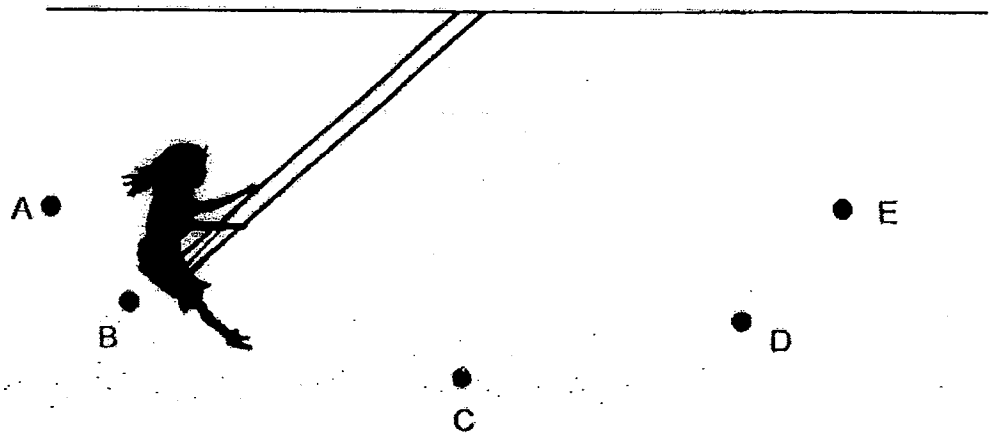
(a) **Name** and **label** on the diagram using the boxes provided above,

(i) the part where digestion begins.
(ii) the part where digestion ends. [1]



(b) Part P has many folds. How do the "folds" in part P help it to perform its function in the digestion process? [1]

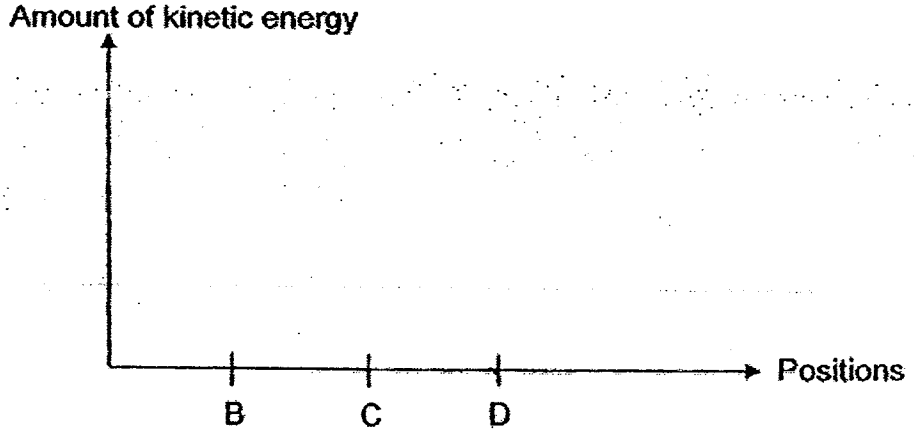
41. Jane was sitting on a swing and was released from point B as shown in the diagram below. When she was released, she swung to point D.



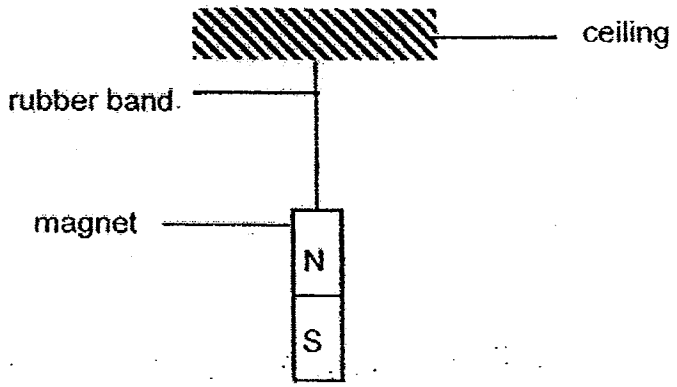
(a) If Jane wanted to reach point E, where should she be released from? Explain your answer in terms of energy conversion. [2]

(b) Explain, in terms of energy conversion, why after swinging for some time, Jane eventually came to a stop. [1]

(c) Draw on the graph below to show how the kinetic energy that Jane possessed changed from point B to point D. [1]

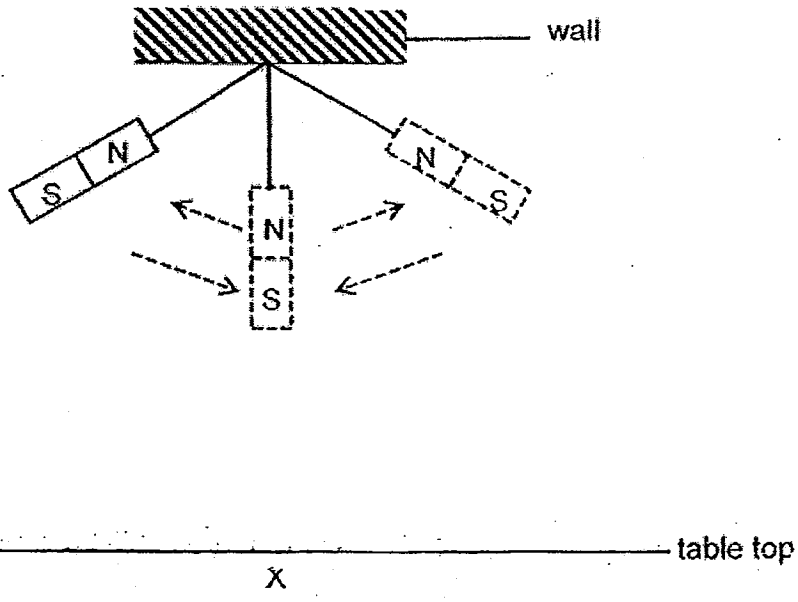


42. A magnet was attached to a rubber band as shown in the diagram below.



(a) In the diagram **above**, use **arrows** to **indicate** the direction of the force(s) that is/are acting on the magnet. Identify the force(s). [2]

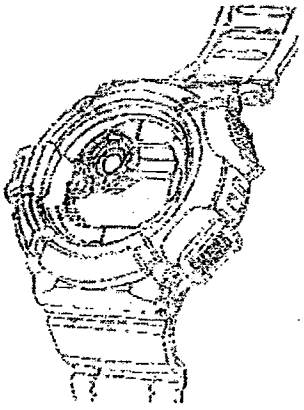
The magnet was then lifted up and allowed to swing from one end to the other end as shown in the diagram below.



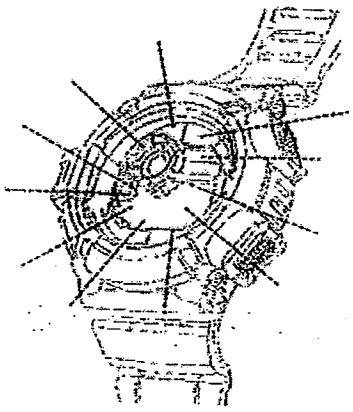
A magnet was then placed on the table top at position X to stop the swinging magnet.

(b) **Draw** and **label** the poles of this magnet such that the swinging magnet would take the shortest time to come to a stop. [1]

43. Matthew has a new wrist watch which has an inbuilt light sensor. The watch display will light up only when it senses that the surrounding is dark.



wrist watch in a well-lit room



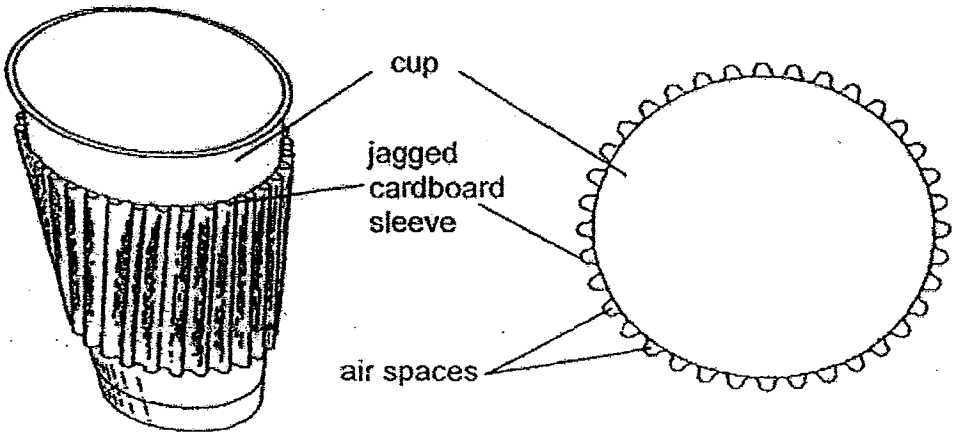
wrist watch in a dark room

(a) Explain, using the property of light, how Matthew is able to see the wrist watch in a well-lit room. [1]

(b) Describe how Matthew is able to see the wrist watch in a dark room. [1]

(c) A piece of cardboard is placed between Matthew and the wrist watch. Explain why he is unable to see the wrist watch anymore. [1]

44. Tammy bought a cup of coffee and it came in a cup sleeve as shown in the diagram below.



(a) Explain how the design of this cup sleeve helps customers to hold the hot cup of coffee in their hands without being burnt. [2]

(b) Explain how the material of the sleeve above helped to keep drinks warm for a longer period of time compared to a metal sleeve. [1]

EXAM PAPER 2015

SCHOOL : NANYANG

SUBJECT : P6 SCIENCE

TERM : SA1

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
3	3	3	2	2	3	1	2	2	3
Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
2	3	1	1	2	3	2	2	2	3
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
3	3	2	3	2	3	4	1	1	2

31)a)He wanted to find out which type of water was best for watering plants.

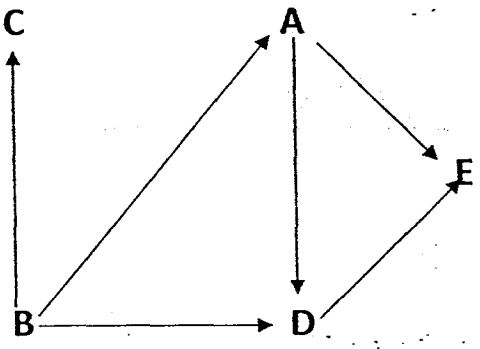
b)The type of soil used.

32)a)Step 2: Pour an equal amount of pond water into each metal container.

Step 3: Plant duckweeds in one container.

b)To ensure that the hydrillas are only able to receive light from the opening of the container.

33)a) C



b)The dead leaves would decompose and return to the ground as mineral salts for the tree.

34)a)The water in beaker A gained heat from the Bunsen burner and evaporated into water vapour. When the water vapour rose, it came into contact with the cooler surface of the metal ruler and condensed, forming tiny water droplets which dripped down the ruler and into beaker B.

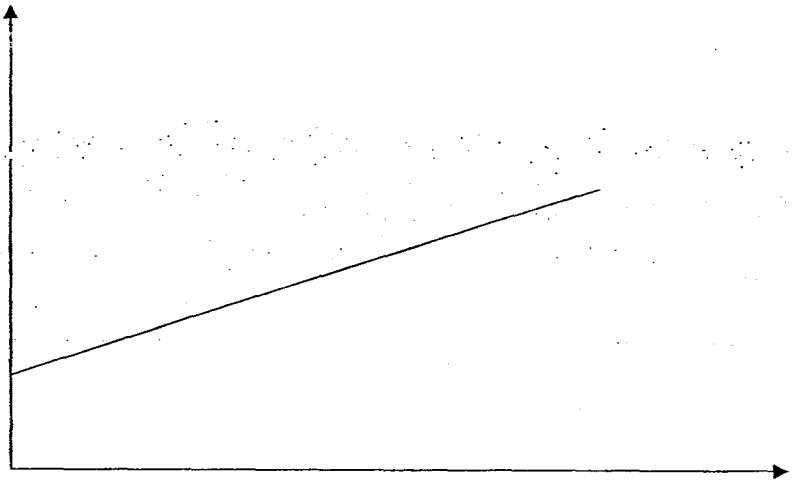
b)When the water vapour in beaker A evaporated into water vapour, some vapour did not condense on the ruler, but it became part of the surrounding air.

c)i)Move beaker A closer to the Bunsen burner.

ii)Increase the intensity of the Bunsen burner's flame.

35)a)Both reproduce spores.

b)



36)a)X : Wind / Wing-like structures

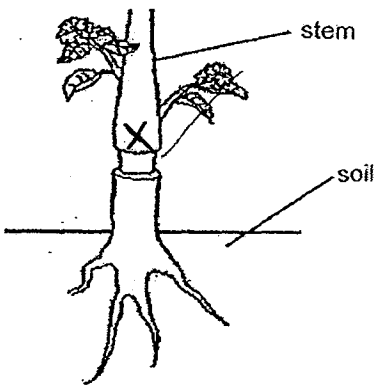
Y: Water/ Fibrous husk

b)To prevent overcrowding and reduce competition for water, space, light and mineral salts.

37)a)The candle stopped burning due to lack of oxygen.

b)As the lift tightly shut, no air could enter or escape, hence the amount of oxygen inside the lift would decrease and the carbon dioxide would increase as he respired, thus he would have to respire faster in order to get enough oxygen.

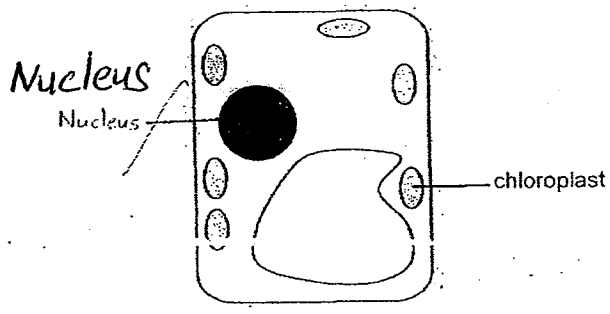
38)a)



b)The roots of the plants were unable to receive the food made by the leaves and the roots died and stopped taking in water which was needed by the plant to survive.

39)a)Leaf. The cell contains chloroplast, which are mostly found in the leaves of plants to help them make food.

39)b)



cell from plant (enlarged view)

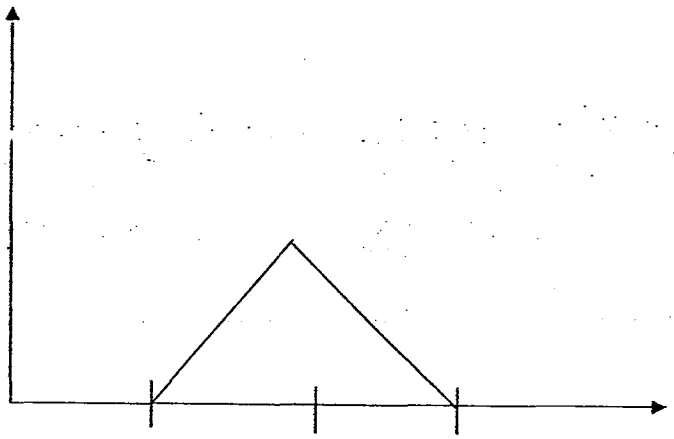
40)a)i)Mouth ii)Small intestine

b)It slows down the passage of food along the intestines for greater absorption of digested food.

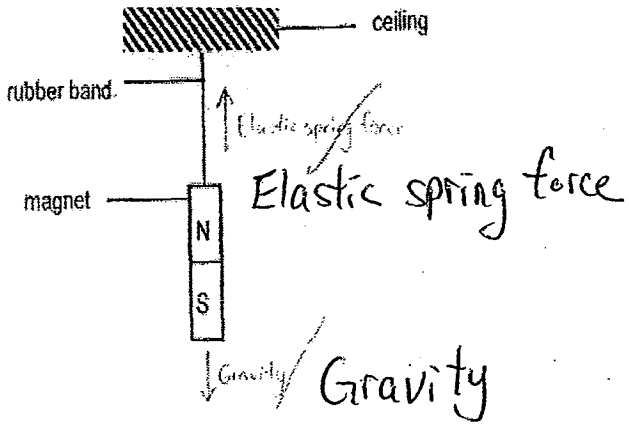
41)a)Point A is the highest point, hence Jane will possess more gravitational potential energy which will be converted to more kinetic energy.

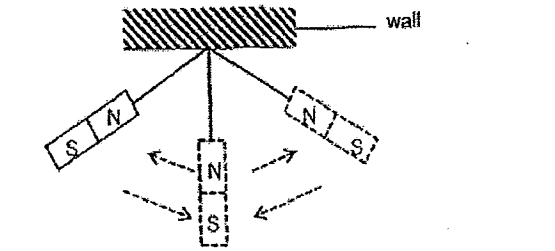
b)All the kinetic energy possessed by the swing had been converted to other forms of energy such as sound energy and heat energy, hence the swing came to a stop.

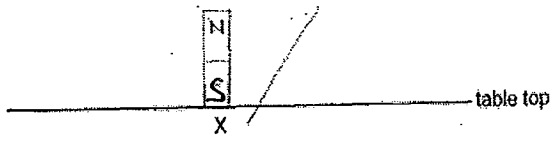
c)



42)a) b)







43)a)Light is reflected into his eyes from the watch.

b)The watch display lights up and the light is reflected into his eyes.

c)Cardboard is opaque, hence the light cannot pass through it.

44)a)The jagged cardboard sleeve reduces the surface area in contact with the hand hence less heat will be lost to the hand.

b)The cardboard sleeve is a poorer conductor of heat than a metal sleeve and the cup of hot coffee will lose heat slower to the surroundings.