PRIMARY 4 SCIENCE

SEMESTRAL ASSESSMENT 1
2016

BOOKLET A

Date : 4 May 2016
Duration : 1 h 45 min

Name : _____ (   )

Class: Primary 4 (   )

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

Booklet A consists of 18 printed pages including this cover page.

For each question from 1 to 28, 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. R is a living thing and its characteristics are given below.

    Reproduces by spores
    Cannot make its own food
    Can be seen with the naked eye
    Absorbs food from the surrounding

    Which one of the following could represent living thing R?

    (1) Moss
    (2) Grass
    (3) Yeast
    (4) Mushroom

2. Ali bought a solar toy plant that moves its leaves when light is shone on it. His classmates made the following statements about the solar toy plant.
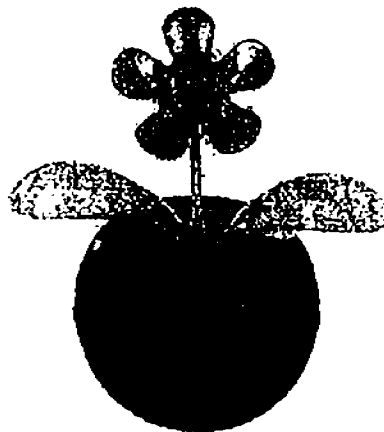
    Abby   The plant is a living thing because it can move.
    Betty   The plant is a living thing because it responds to light.
    Chris   The plant is a non-living thing because it cannot grow.
    Daud   The plant is a non-living thing because it does not need air, food and water to survive.

    Which pupils had made the correct statement?

    (1) Abby and Betty
    (2) Abby and Chris
    (3) Betty and Daud
    (4) Chris and Daud

3. Which one of the following statements is false?

(1) All plants have roots, stems and leaves.
(2) The stem of some plants are found underground.
(3) The roots of all plants are found underground only.
(4) The flowers of the plant are needed for the production of fruits.

4. The table below shows some characteristics of animals P, Q and R.
A tick (√) shows that the animal has that characteristic.

Animal	Has 3 body parts	Lays eggs	Feeds its young with milk
P	√	√	
Q		√	
R			√

Which of the following animals could P, Q and R represent?

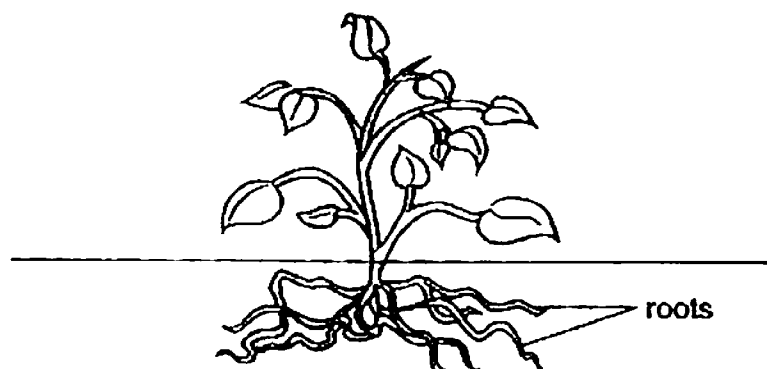|	P	Q	R
(1)	snake	ant	cat
(2)	grasshopper	bat	toad
(3)	goldfish	eagle	turtle
(4)	ant	goldfish	elephant

5. Some animals were classified as shown below.
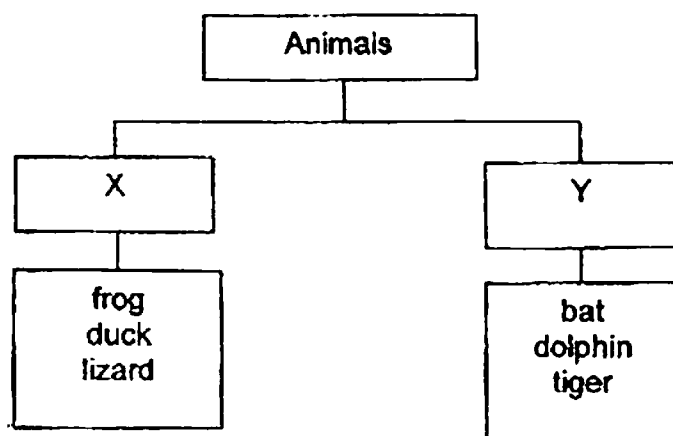
Which one of the following could correctly represent X and Y?

	X	Y
(1)	lay eggs	give birth to live young
(2)	have scales	have hair
(3)	live in water	live on land
(4)	have feelers	do not have feelers

3

6. Study the diagram shown below.

roots

Based on the way that the roots had grown, which of the following are the correct functions of the roots?

A   make food for the plant
B   take up water for the plant
C   release nutrients to the soil
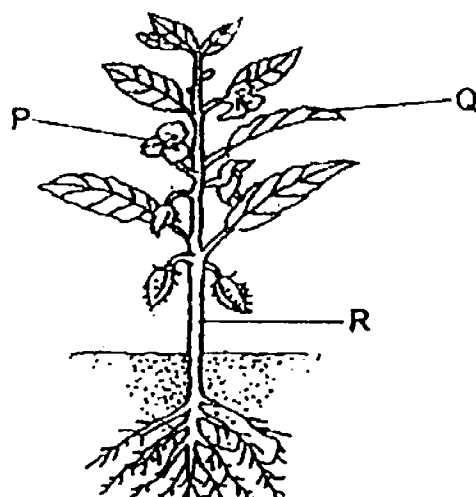D   hold the plant firmly to the soil

(1) A and C only
(2) A and D only
(3) B and C only
(4) B and D only
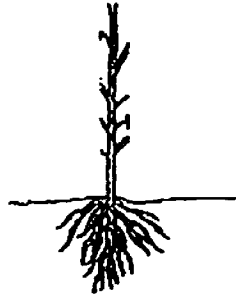
7. The diagram below shows a plant.

Which of the following correctly represents the parts marked P, Q and R?

	P	Q	R
(1)	fruit	stem	leaf
(2)	fruit	leaf	stem
(3)	flower	stem	leaf
(4)	flower	leaf	stem

8. Mary cut off all the leaves of a healthy plant in her garden as shown below.

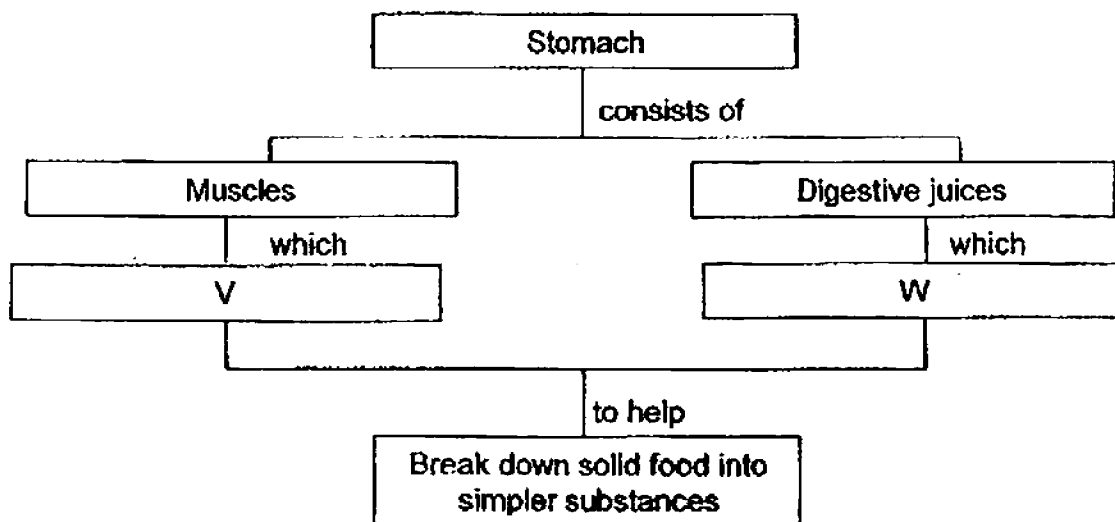

After two weeks of watering, she noticed that the plant died.
Which one of the following could be a possible reason the plant died?

(1) The plant could not bear fruit.
(2) The plant could not make food.
(3) The plant could not take in the surrounding soil.
(4) The plant could not absorb sunlight to make oxygen.

9. The lungs take in oxygen and remove carbon dioxide from the body. Which of the following systems directly enable the body to carry out the function mentioned?

(1) Skeletal System
(2) Digestive System
(3) Muscular System
(4) Respiratory System

10. Which of the following correctly describes the difference between the small intestine and large intestine?

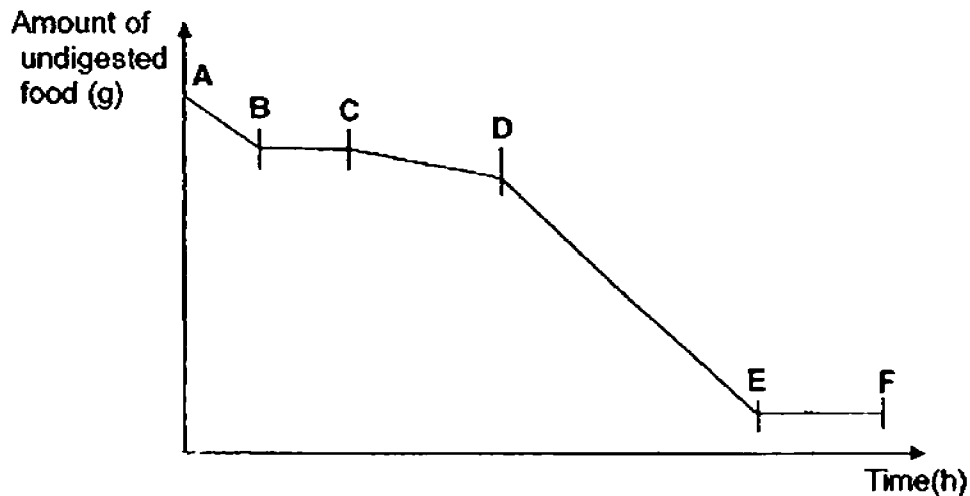|	Small Intestine	Large Intestine
(1)	Digestion begins here	Digestion ends here
(2)	Digestion takes place	No digestion takes place
(3)	Absorbs food and water only	Absorbs water only
(4)	Does not contain digestive juice	Contains digestive juice

11. Study the concept map below carefully.

```
                        ┌─────────────────┐
                        │     Stomach     │
                        └─────────────────┘
                                 │ consists of
            ┌────────────────────┴────────────────────┐
  ┌───────────────────┐                    ┌───────────────────┐
  │     Muscles       │                    │  Digestive juices │
  └───────────────────┘                    └───────────────────┘
            │ which                                  │ which
  ┌───────────────────┐                    ┌───────────────────┐
  │        V          │                    │        W          │
  └───────────────────┘                    └───────────────────┘
            └────────────────────┬────────────────────┘
                                 │ to help
                  ┌───────────────────────────────┐
                  │  Break down solid food into   │
                  │      simpler substances       │
                  └───────────────────────────────┘
```

Which of the following best describes V and W?

|	V	W
(1)	Absorbs water	Absorbs nutrients
(2)	Shapes food into small balls	Pushes food down
(3)	Pushes food down	Helps to churn food
(4)	Churns food with digestive juices	Digests the food

6

12. The graph below shows the amount of undigested food found in different parts of the digestive system after a student had taken his breakfast.

Which one of the following represents the parts of the digestive system correctly?

|	AB	CD	DE	EF
(1)	gullet	mouth	small intestine	large intestine
(2)	mouth	stomach	small intestine	large intestine
(3)	large intestine	small intestine	stomach	mouth
(4)	mouth	gullet	stomach	small intestine

13. Peter set up 2 bar magnets as shown below. He brought compass X towards one end of the bar magnet as shown in the diagram below.
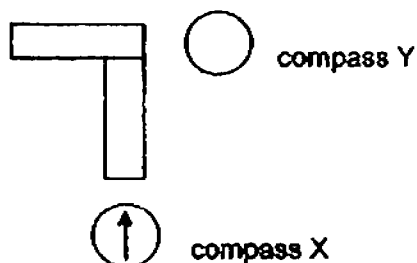
Which one of the following diagrams correctly represents the direction that compass Y will point to?

(1)

(2)

(3)

(4)

14. Minnet wanted to find out if the number of coils around a rod affects its magnetic strength. She used identical rods, batteries and wires in her set-ups as shown below.

set-up P   rod

set-up Q   rod

set-up R   rod

set-up S   rod
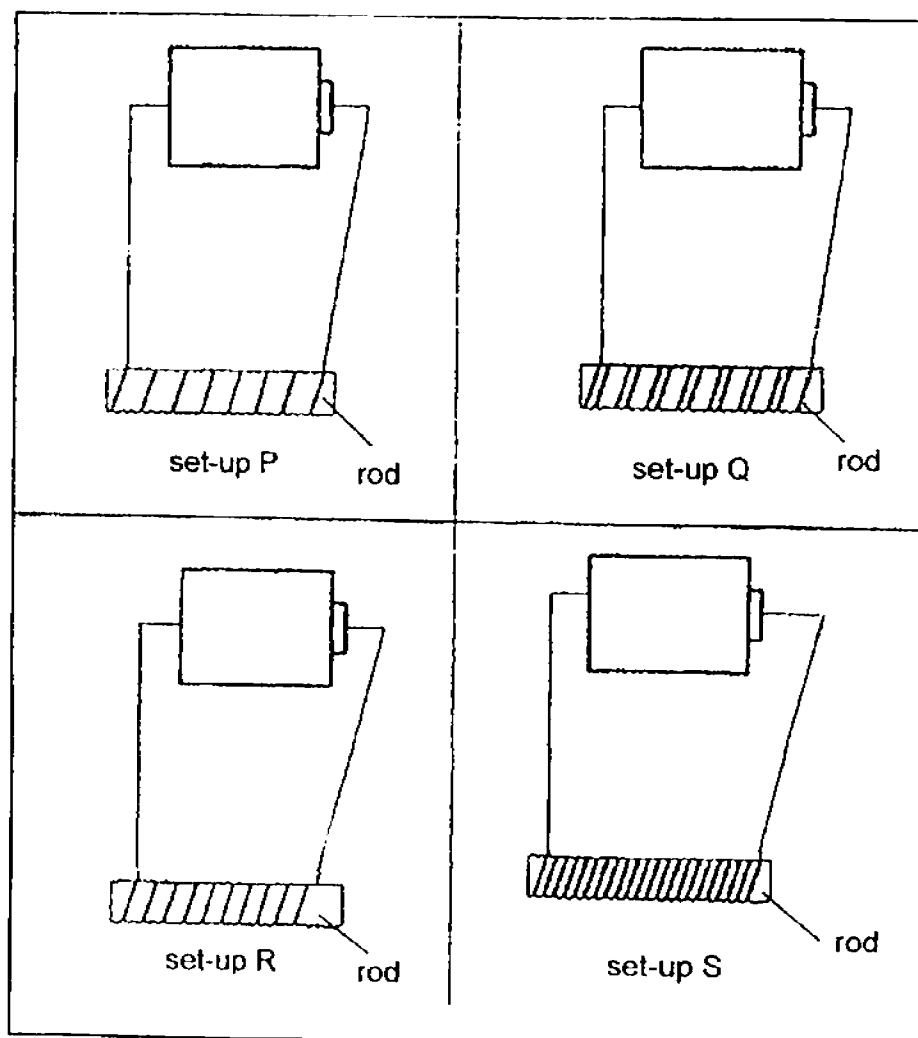
Which one of the following shows the correct arrangement of the magnetised rods according to their magnetic strengths starting from the weakest to the strongest?

	weakest ⟶			strongest
(1)	P	Q	R	S
(2)	P	R	Q	S
(3)	R	P	Q	S
(4)	S	Q	R	P

15. Study the classification table below.

Group A	Group B
lit match	table
fire	moon
street lamp	ruler
object P	object Q

Which of the following below incorrectly identifies objects P and Q?

	Object P	Object Q
(1)	firefly	battery
(2)	highlighter	Sun
(3)	lightning	mirror
(4)	candle light	highlighter

16. Which of the following statements explain why Melissa can see the balloon using the periscope?
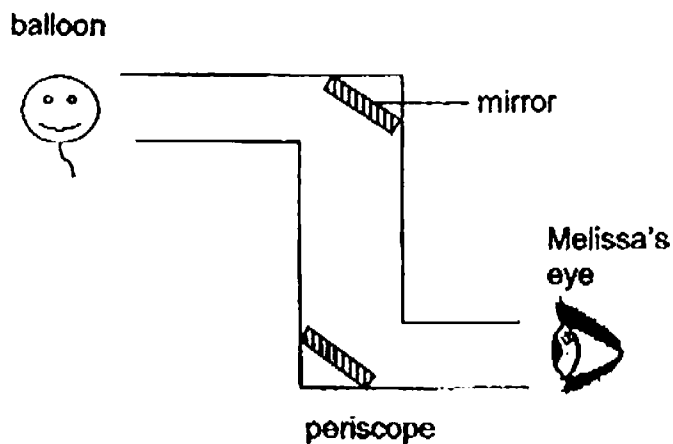
balloon

A   Light travels in a straight line.
B   Light reflects from Melissa's eyes.
C   The mirrors reflect the light from Melissa's eyes into the balloon.
D   The mirrors reflect the light that falls on the balloon into Melissa's eyes.

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

17. Pauline forms a shadow on a screen by positioning an object X in the path of light from a torch.
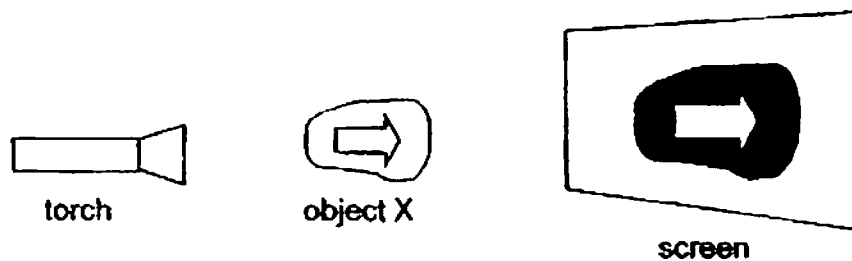
Which of the following actions will **decrease** the size of the shadow?

A   change the batteries in the torch
B   move the torch nearer to the object
C   move the screen nearer to the torch
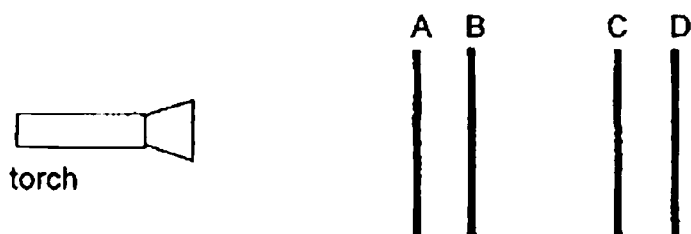D   move the object closer to the screen

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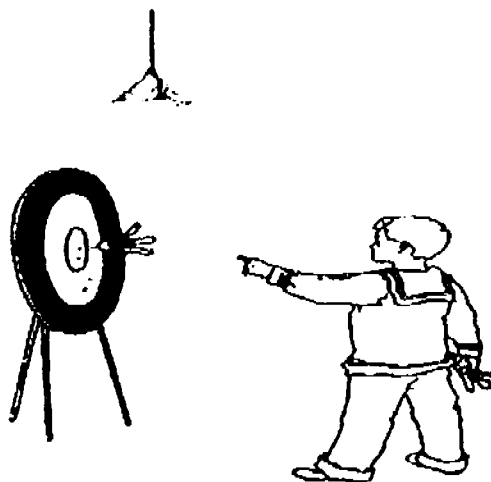(3)   B and D only   (4)   C and D only

10

18. Anisah used 4 different materials to cut out the shapes as shown below.

material A	material B	material C	material D
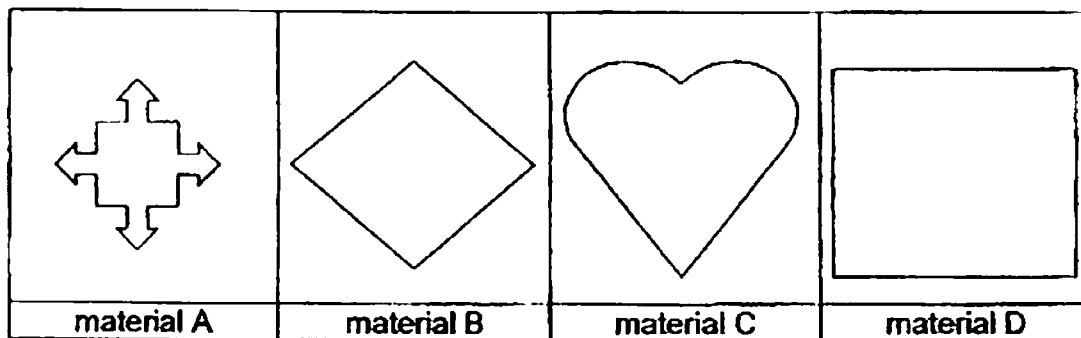
She placed the 4 materials one in front of the other as shown in the diagram below and shone a torch in front of them.

A B   C D

torch

Anisah then recorded her observations on material B and material D as shown below.

observation on material B	observation on material D

Which of the following shows the degree of transparency of materials A, B, C and D?

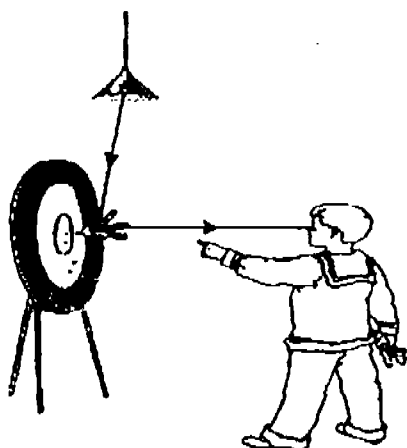|	Allows light to pass through	Does not allow light to pass through
(1)	C	A, B and D
(2)	A and B	C and D
(3)	A, C and D	B only
(4)	A, B, and D	C only

11

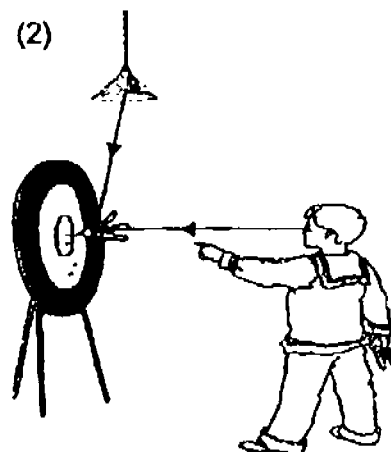19. Look at the picture below.

Which of the following shows the correct light rays to explain why Tom can see the dart on the dart board?
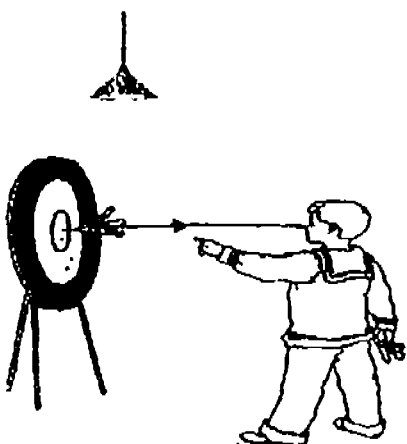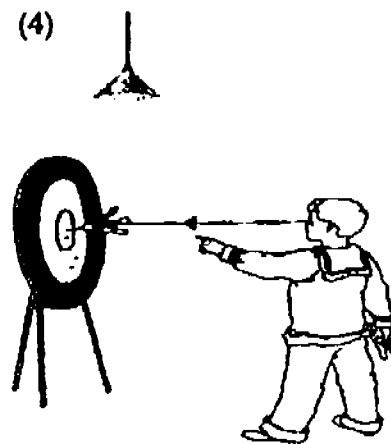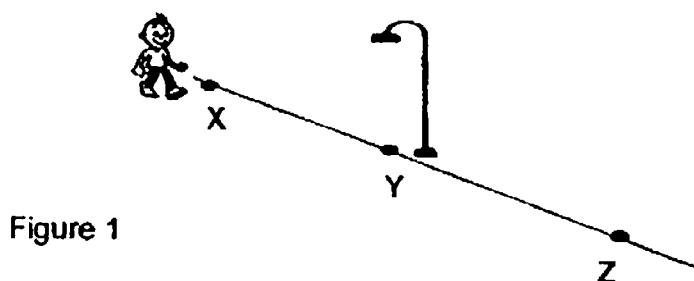
(1)

(2)

(3)

(4)

20. Jerome walked in a straight line from points X to Z as shown in Figure 1 below. At point Y, he was directly under the lamp. The distance between X and Y is the same as the distance between Y and Z.

Figure 1

Based on the diagram in Figure 1, which one of the following statements about Jerome's walk is **correct**?

(1) The length of his shadow is the longest at position Y.
(2) The longest length of the shadow is at both positions X and Z.
(3) The faster he walked towards the lamp, the longer his shadow would be.
(4) As he walked away from the lamp from Y to Z, his shadow became shorter.

21. Naresh set-up an experiment as shown below.

torch   object   datalogger
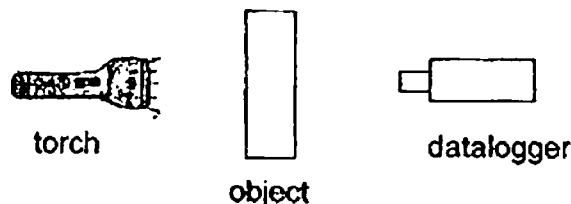
He shone the torch at the datalogger and it detected a reading of 4000 lux. He then put object A and shone the torch on it. The datalogger was placed behind the object to measure the amount of light passing through Object A. He repeated the experiment with objects B, C and D.

The table below shows the readings which measured the amount of light passing through each object.

Object	Amount of light (lux)
A	0
B	967
C	3345
D	0

Which one of the following materials could object B mostly likely made of?

(1) wood   (2) clear plastic
(3) frosted glass   (4) stainless steel

22. A bridge was being built near a bus-stop at Rania's house. As a result, the pedestrian pathway had to be blocked as shown in the diagram below.
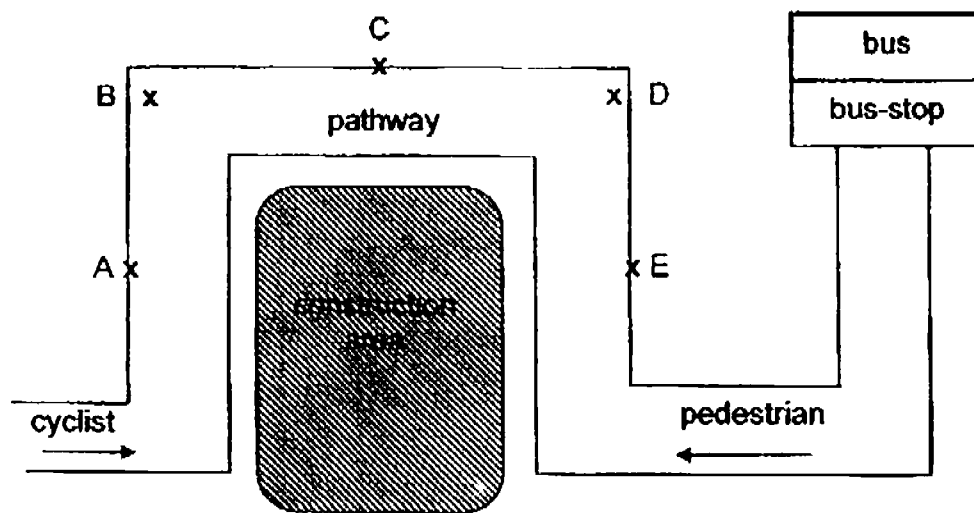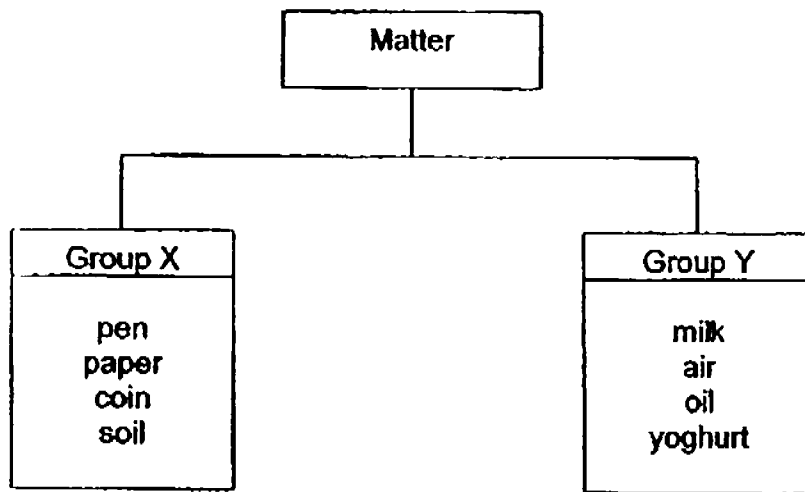

Top view

The pathway is used by both cyclists and pedestrians. At which points must a mirror be placed to prevent the cyclists and pedestrians from bumping into one another?

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

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

A   Not all matter can be seen.
B   Both matter and non-matter have mass.
C   Matter takes up space but non-matter does not take up space.
D   Living things are not solid, liquid or gas so they are not matter.

(1) A only   (2) A and C only
(3) B and D only   (4) A, C and D only
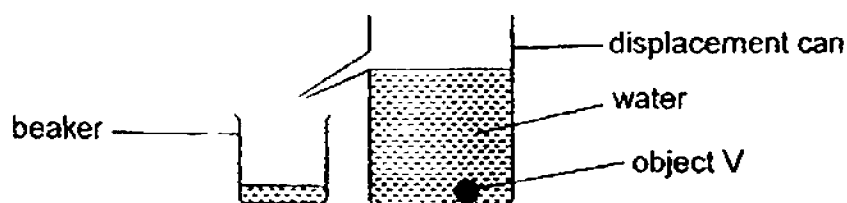
24. Study the following classification chart.

```
                    ┌─────────────┐
                    │   Matter    │
                    └──────┬──────┘
              ┌────────────┴────────────┐
    ┌─────────────────┐       ┌─────────────────┐
    │ Group X         │       │ Group Y         │
    │                 │       │                 │
    │      pen        │       │      milk       │
    │      paper      │       │      air        │
    │      coin       │       │      oil        │
    │      soil       │       │      yoghurt    │
    └─────────────────┘       └─────────────────┘
```

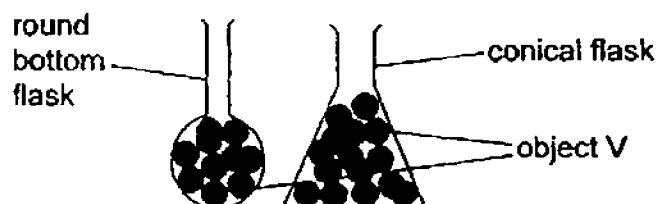Based on the classification chart, what can we conclude about Group X and Group Y?

(1)   Group X has definite mass but Group Y does not have definite mass.
(2)   Group X has definite shape but Group Y does not have definite shape.
(3)   Group X has definite volume but Group Y does not have definite volume.
(4)   Group X takes the shape of the container but group Y does not take the shape of the container.

15

25. Ray En carried out three different experiments, A, B and C, on round object V. The diagrams below show the results of her experiments.
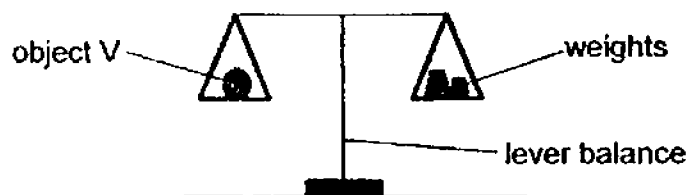
A

beaker

displacement can

water

object V

B

round bottom flask

conical flask

object V

C

object V

weights

lever balance

Which of the following conclusion(s) about the experiments is/are correct?

| Experiment	Conclusion
A	Object V occupies space.
B	Object V does not have definite shape
C	Object V has mass

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

26. Rahim hung two objects, S and T, and a 500g weight on a lever balance. The following diagrams show what he observed.
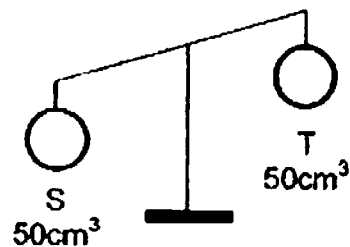

He then compared the 50cm³ of object S with object T of different volumes. Which of the following observations are possible?
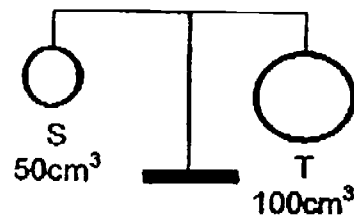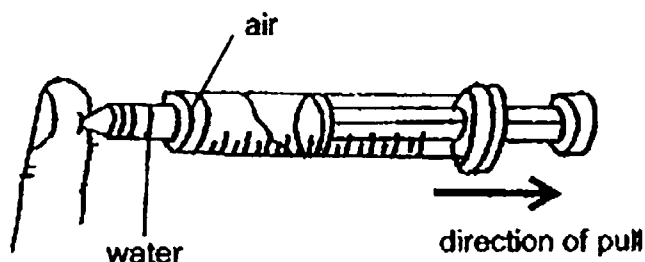
A
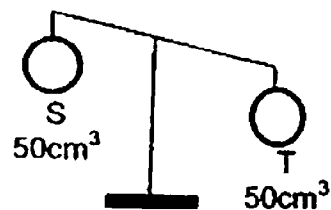
B

C

(1)   A only
(3)   A and C only

(2)   B only
(4)   B and C only

27. Maryanne filled a syringe with some tap water. She blocked the tip and pulled the plunger of the syringe outwards as shown in the diagram below.

air

water

direction of pull

Which of the following correctly describe what would happen to the volume of the air and water in the syringe when she pulled the plunger?

	Volume of Air	Volume of Water
(1)	Remains the same	Remains the same
(2)	Decrease	Increase
(3)	Increase	Decrease
(4)	Increase	Remains the same

28. Edison had two 250ml beakers, P and Q. A stone was tied with a string and lowered into beaker P. A metal rod was tied with a string and lowered into beaker Q. Water was then added until the water levels for both beakers reached the 250ml mark as shown in the diagram below.

250ml

P   Q
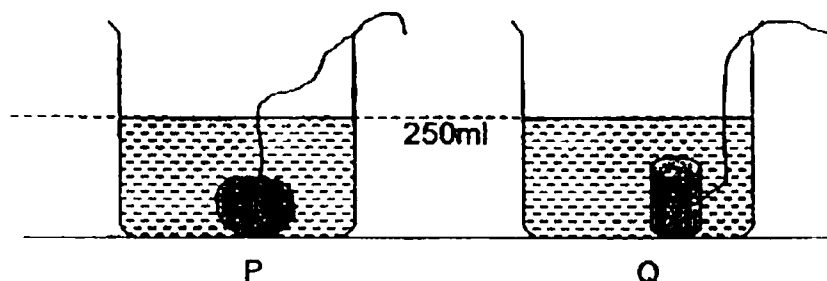
With the help of the string, the stone and the metal rod was removed from the beaker and the amount of water left was measured.

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

A   Both the stone and the metal rod have the same volume

B   Both the stone and the metal rod has a volume of less than 250ml

C   Both the stone and the metal rod has a volume of more than 250ml.

D   The volume of the water left in beaker P and Q is the volume of the stone and the metal rod.

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

18

PRIMARY 4 SCIENCE

SEMESTRAL ASSESSMENT 1
2016
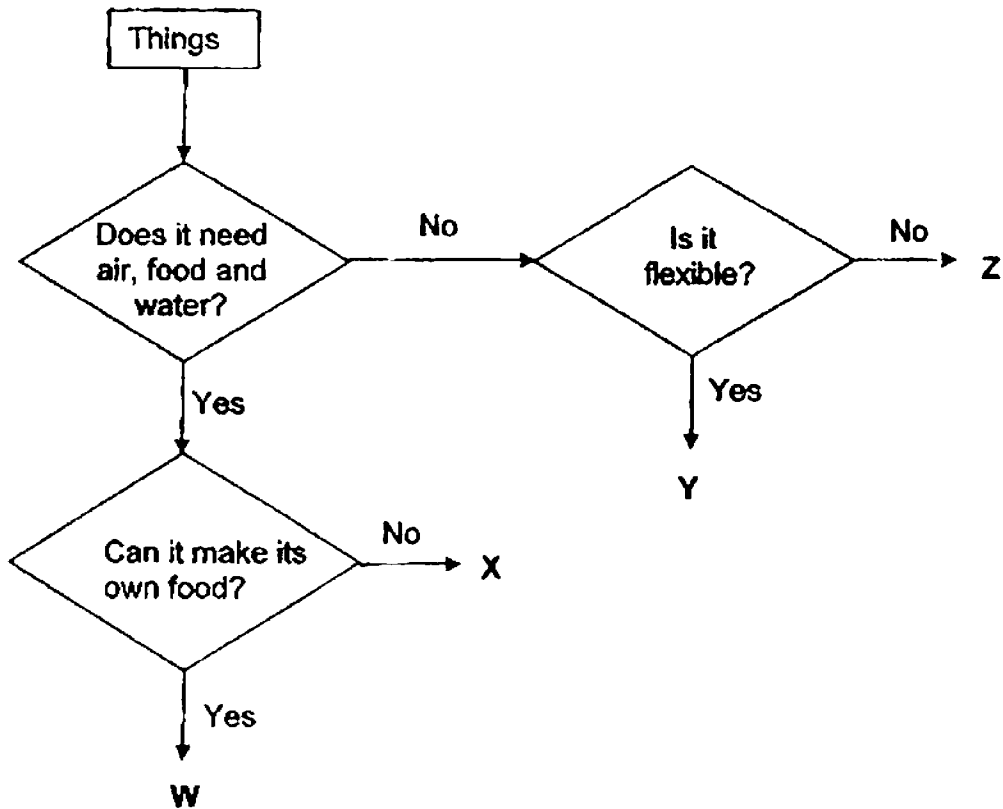
BOOKLET B

Date : 4 May 2016

Duration : 1 h 45 min

Section B (44 marks)

Write your answers to questions 29 to 41 in the spaces provided.

29. Study the flow chart below.

(a) State all the characteristics of X. [1]

_____

_____

(b) State the difference between W and Z. [1]
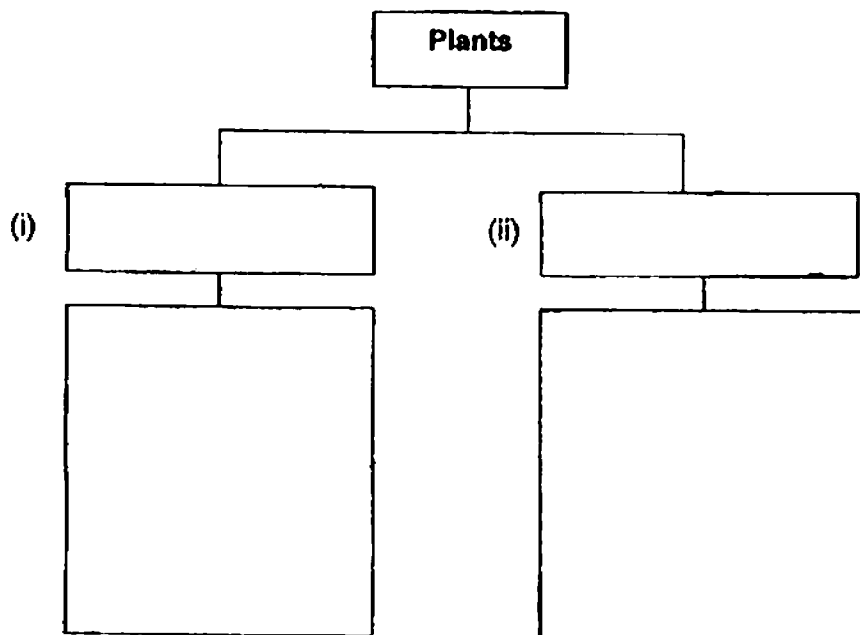
_____

_____

(c) State the similarity between Y and Z. [1]

_____

(d) Give an example of W. [1]

_____

30.   Study the living things given below.

- moss
- coconut tree
- bird's nest fern
- rose plant
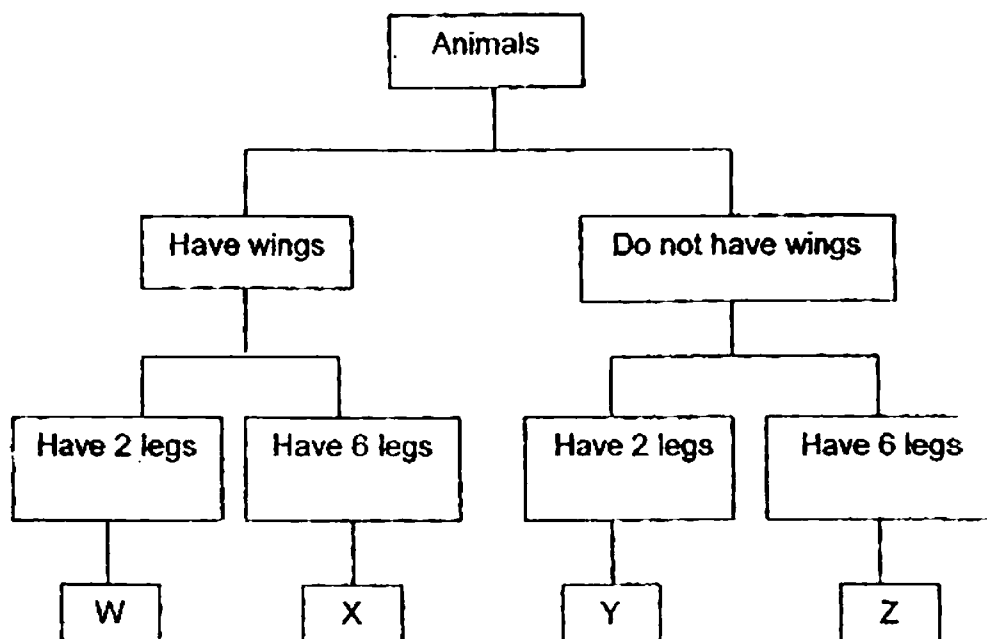
(a)   Fill in the classification chart to show how all the living things above can be classified. Give the chart a suitable heading.   [2]

```
                          ┌──────────┐
                          │  Plants  │
                          └────┬─────┘
              ┌────────────────┴────────────────┐
     ┌────────┴────────┐              ┌──────────┴─────────┐
(i)  │                 │         (ii) │                    │
     └────────┬────────┘              └──────────┬─────────┘
     ┌────────┴────────┐              ┌──────────┴─────────┐
     │                 │              │                    │
     │                 │              │                    │
     │                 │              │                    │
     │                 │              │                    │
     └─────────────────┘              └────────────────────┘
```

(b)   Can toadstool be placed in any of the group above? Explain your answer.
                                                                              [1]

_____

_____

(c)   State how non-flowering plants reproduce.   [1]

_____

31. Study the classification diagram below.

```
                        ┌──────────┐
                        │ Animals  │
                        └────┬─────┘
                 ┌───────────┴────────────┐
          ┌──────────┐             ┌────────────────┐
          │Have wings│             │Do not have wings│
          └────┬─────┘             └───────┬────────┘
          ┌────┴─────┐             ┌────────┴────────┐
    ┌──────────┐┌──────────┐  ┌──────────┐┌──────────┐
    │Have 2 legs││Have 6 legs│  │Have 2 legs││Have 6 legs│
    └────┬─────┘└────┬─────┘  └────┬─────┘└────┬─────┘
       ┌─┴─┐      ┌─┴─┐         ┌─┴─┐      ┌─┴─┐
       │ W │      │ X │         │ Y │      │ Z │
       └───┘      └───┘         └───┘      └───┘
```

(a) Based on the classification diagram above, state two characteristics of Animal W. [1]
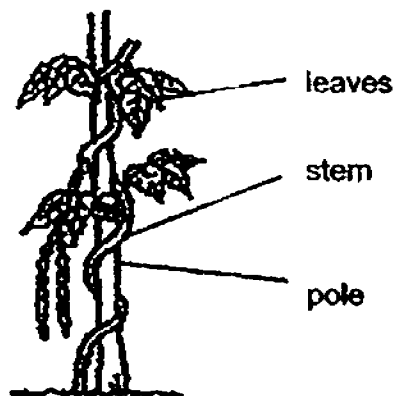
(i) _____

(ii) _____

(b) Which letter, W, X, Y or Z, could represent 'Man'? Explain your answer. [1]

_____

_____

(c) Identify the group of animals that X belongs to. [1]

_____

(d) A student stated that groups X and Z belong to the same animal group. State another characteristic of this group of animals. [1]

_____

_____

4

32. Study the picture of Plant X below.

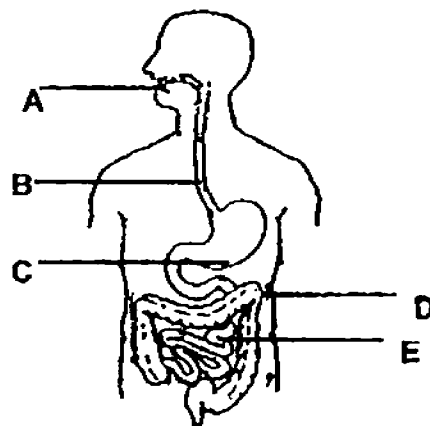(a) State 2 functions of the stem of plant X.   [2]

(i) _____

(ii) _____

(b) Explain how the pole helps plant X.   [1]

_____

33. The diagram below shows parts A, B, C, D and E in the human digestive system.

(a) In the table below, identify points A, B, C, D and E based on the functions stated. Each letter may only be used once. [2]

	Function	Part
i)	Larger pieces of food are moistened and broken down to smaller pieces.	
ii)	Water is absorbed here from the remaining undigested food.	
iii)	Partial digestion of food takes place here. It releases acid and enzymes for the chemical breakdown of the food.	
iv)	Small pieces of food are pushed down the tube.	
v)	Most of the digestion occurs here and nutrients are absorbed into the bloodstream.	

(b) Parts B and C work closely with the muscular system in the digestion of food.
Explain how the muscles in parts B and C help in digestion. [2]

Part B : _____

_____

Part C : _____

_____

6

34. Mili wanted to find out which part of a bar magnet has the greatest magnetic strength. She conducted an experiment using the set-up as shown below.
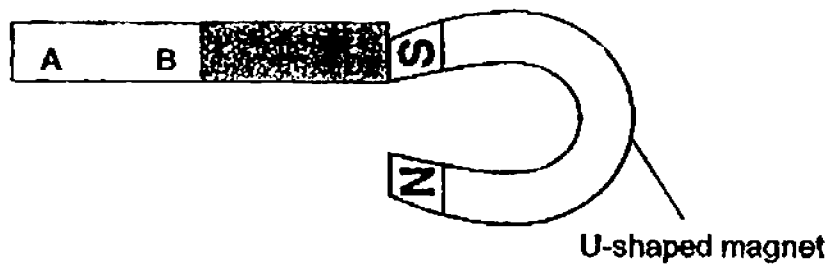

bar magnet
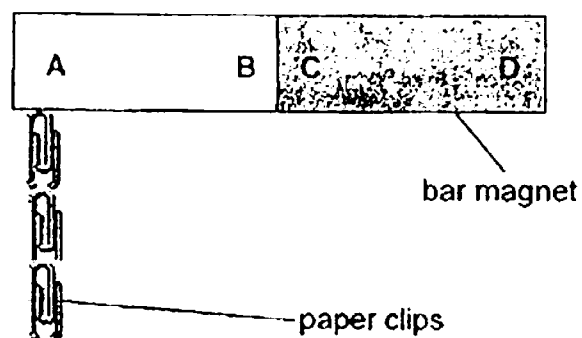
paper clips

She recorded the number of paper clips attracted by the magnet at part, A, B, C and D in the table below. She repeated her experiment using pins and recorded her results in the same table.

Part of magnet	A	B	C	D
Number of paper clips	10	4	5	11
Number of pins	19	11	11	20

(a) Based on the results above, what conclusion can Mili make about the strength of the different parts of a bar magnet? [2]

_____

_____

Mili then bought a U-shaped magnet with its S-pole close to the bar magnet. She observed that the bar magnet moved towards the U-shaped magnet as shown below.

U-shaped magnet

(b)   State the pole of part D of the bar magnet and the property of magnets that is demonstrated in Mili's observation above.   [2]
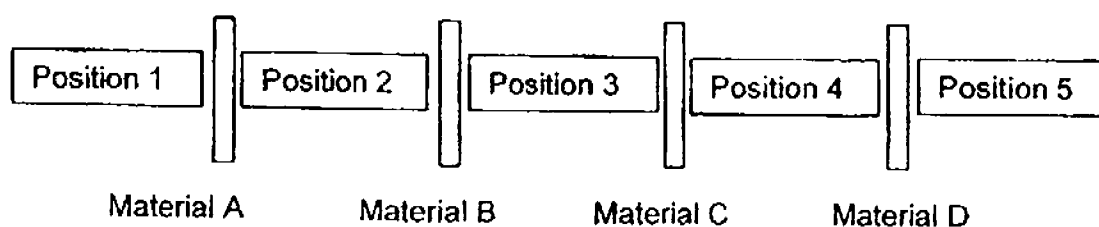
(i)   Pole of part D: _____ pole

(ii) Property demonstrated:

_____

_____

35. The table below shows the readings which measured the amount of light passing through each material.

Material	Amount of light (lux)
A	286
B	1497
C	4305
D	0

5 boys, **Peter, Quentin, Ryan, Sam and Terence**, are separated by each material as shown in the diagram below. They are allowed to look in both directions.

| Position 1 | Position 2 | Position 3 | Position 4 | Position 5 |

Material A   Material B   Material C   Material D

The boys recorded their observations that they had made as stated below:

i)   Quentin can see both Peter and Sam.
ii)   Terence cannot see any of the boys.
iii)   Sam can see Quentin, Ryan and Peter.
iv)   Ryan can only see Sam.

Based on the above observations, write down the **Position 1, 2, 3, 4 or 5** of the boys in the space provided below. [2]

Peter   Position _____
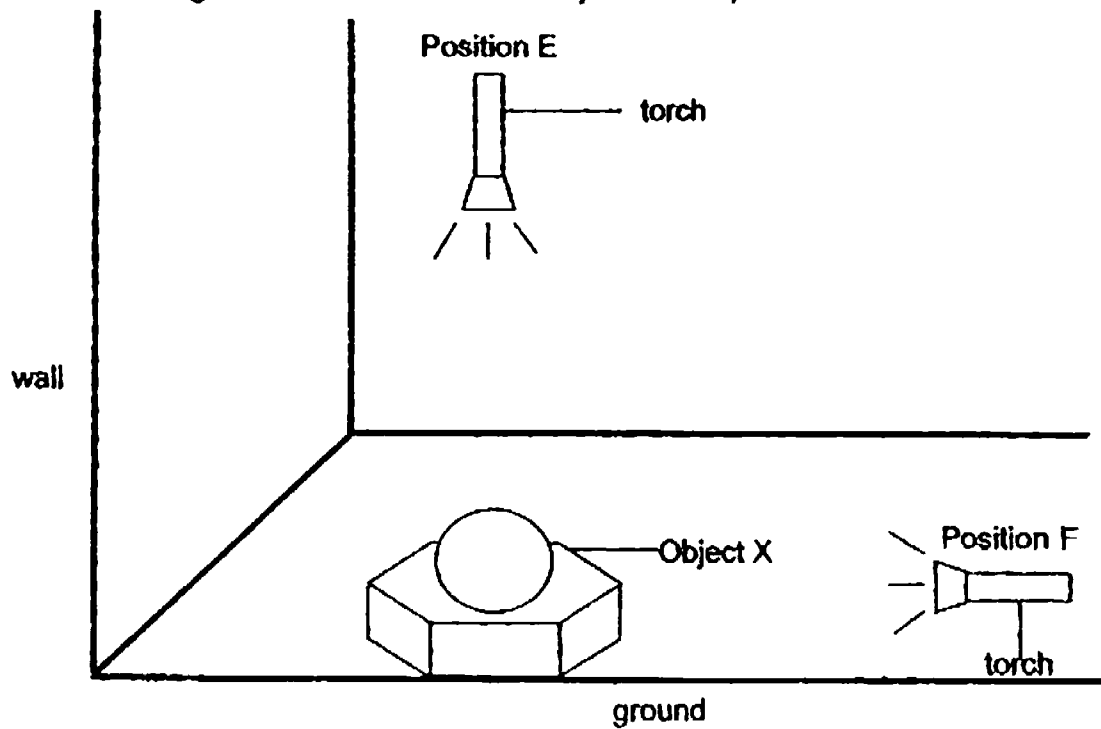
Quentin   Position _____

Ryan   Position _____

Sam   Position _____

Terence   Position _____

9

36. Mr Leong used a torch to shine on object X from positions E and F.

Position E

torch

wall

Object X

Position F

torch

ground

(a) Draw the shadow of the object

(i) cast on the wall when he shone the torch from Position E. [1]

(ii) cast on the ground when he shone the torch from Position F. [1]

(i) Shadow cast on the wall	(ii) Shadow cast on the ground

(b) Explain how the shadow on the wall is formed. [1]

_____

_____

10

37. The set-up below uses a light barcode scanner to count and record the number of identical object S on a moving belt.
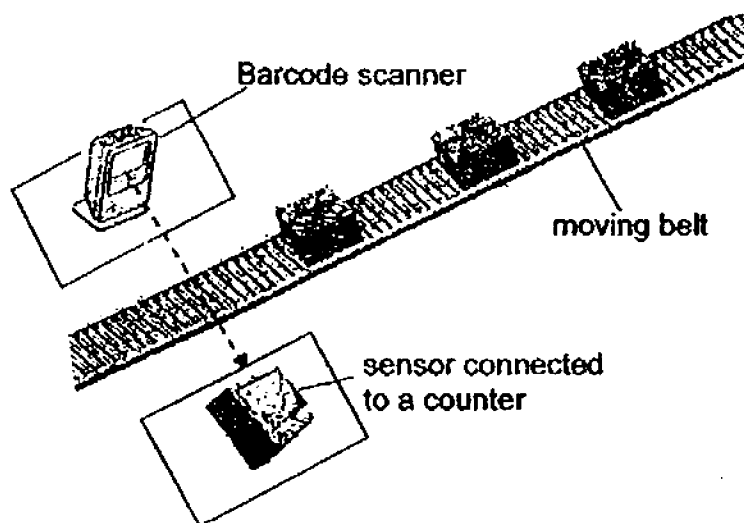
The moving belt is moving at a same speed. When the object S is blocking the light that is produced by the barcode scanner, the data recorded is shown in the table below.

| Time (min)	1	2	3	4	5
Number of Object S	30	60	90	120	150

(a) Without changing the speed, what could be done to enable the scanner to count more object S per minute? [1]

_____

_____

(b) Based on the set-up, write down one property of light. [1]

_____

_____

The barcode scanner is placed 4 cm above the belt.

(c) Explain why an object that is less than 4 cm in height cannot be counted.[1]

_____

_____

11

38. Devi set up an experiment as shown in the diagram below.
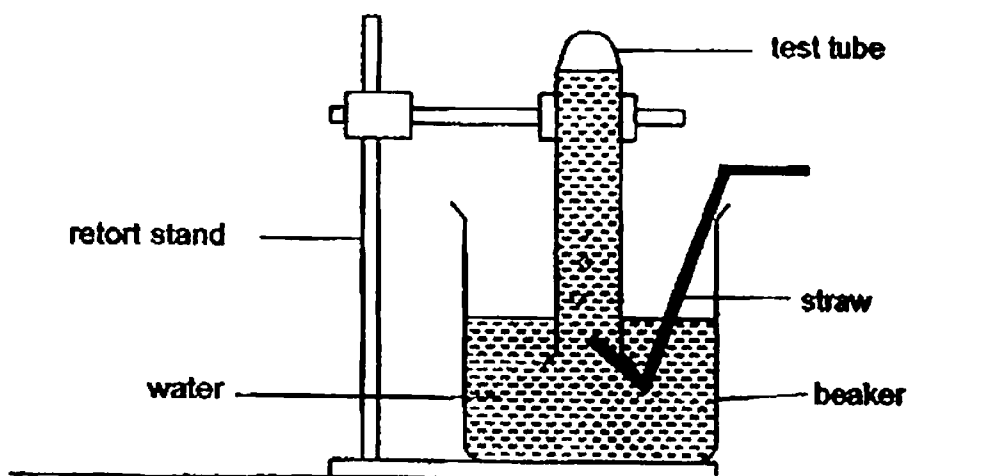
Devi blew through the straw into the test tube.

(a) Using the table below, put a tick in the correct box to show Devi's observations after she blew into the delivery tube two times. [2]

|	rises	drops	remains the same
water level in test tube			
water level in beaker			

Devi then continued to blow into the straw until she saw the water in the beaker starts "bubbling".

(b) Explain this observation. [1]

_____

_____

39. Kai Ling conducted an experiment using 3 plastic cups, X, Y and Z, and a basin of water. Kai Ling made a hole at different positions of cups, X and Y. The cups were then pushed into the basin of water as shown in the diagram below.
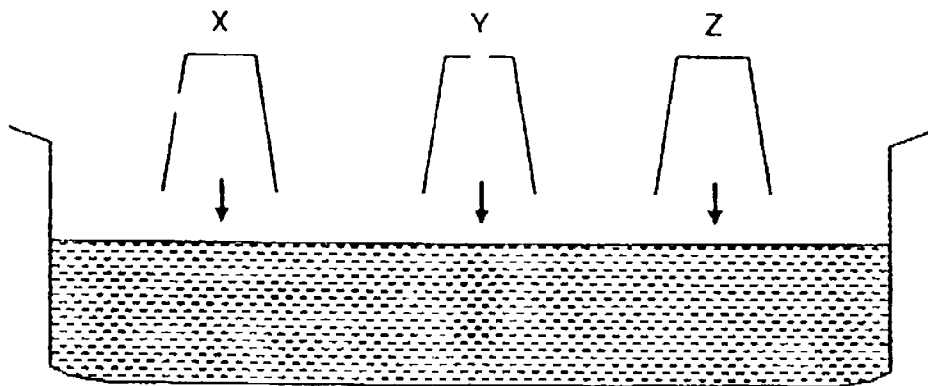
(a)   In the diagram below, **draw** the correct water level that would be observed in cups X, Y and Z. [3]
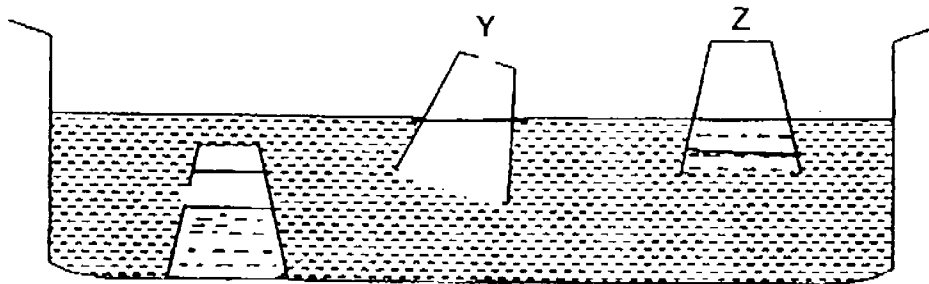

(b)   Write down 1 property of air and 1 property of water that explains your answer in (a). [2]

Air : _____

Water : _____

13

40. Shawn did an experiment on two pieces of cloth, A and B, of the same size and material. He wet cloth A in water and wringed it till there was no water dripping from it. Cloth B remained dry. He hung the two pieces of cloth on a lever balance.
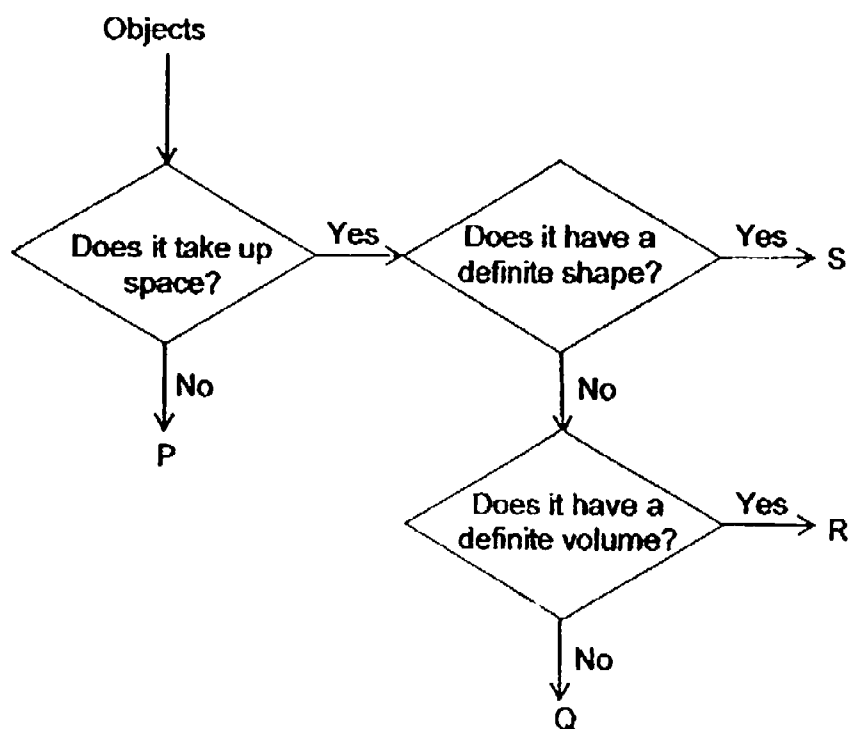
(a) Which of the following diagrams show the result that he would obtain? Tick the correct box. [1]
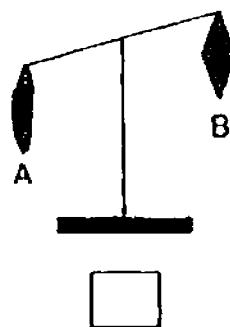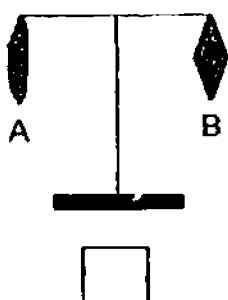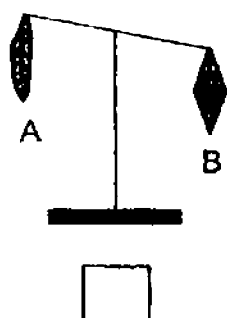
(b) Explain your choice in (a) [1]

_____

_____

_____

_____

41. Objects P, Q, R and S have been classified in the flowchart below based on their properties.

(a) Give an example of object P. [1]

_____

(b) How is object Q different from object S? [1]

_____

_____

(c) Based on the information in the flow chart, describe object R. [1]

_____

_____

EXAM PAPER 2016

SCHOOL :NANYANG

SUBJECT :P4 SCIENCE

TERM : SA1

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

Analysis of selected open-ended questions 2016 P4 Science SA1

29. *Since a flowchart is given, answers have to be from the flowchart.*

29a. Answer : X is a thing that does not need air, food and water and cannot make its own food.

  Note : All characteristics of X in the flowchart has to be listed in order for X to be identified. Use the wordings in the flowchart to craft the answers.

29b. Answer : W does not need air, food and water but Z needs air food and water.

  Note : Make use of the information in the flowchart to answer the question. When making comparison, use the characteristics of the animals.

29c. Answer : **Both Y and Z** does not need air, food and water.

  *Note : For similarity question, start the answer with : **Both** Y and Z.....*

29d. *Specific example has to be given.*

  General examples are not acceptable. Eg : fern, plant, tree

31b. Answer : Y. Man has 2 legs and does not have wings, **like Y**. *(Must show comparison)*

32a. Answer : It helps the plant to climb up the pole *(what the stem is doing)* to get more sunlight *(purpose)* for making food.

  It transports water, mineral salts and food to all parts of the plants.

  Note : Answer has to be with reference to the weak stem plant, Plant X.

  Incorrect answer : It helps to hold/support the plant upright. (This is the function of a ~~stem~~ but not for a weak stem plant)

32b. Answer : Plant X use the pole as a support to climb higher *(how pole is useful to plant)* to get/ reach for more sunlight *(purpose)* for making food *(reason)*.

34a. Answer : **Poles/ Ends** of magnets are the strongest and the **centre** of the magnet is the weakest.

  Incomplete answer : A and D are strongest but B and C are weakest. *(pupils must draw conclusion that A and D are poles of magnets while B and C are the centre of the magnet)*

  Unaccepted answers : A and D attracted the most numbers of paper clips followed by C than B. *(Observations stated instead of a conclusion.)*

34bii. Answer : Unlike poles of magnet attract.

  Note : diagram only demonstrate attraction between unlike poles of magnet. Additional information given will be penalised.

36a. Shadow drawn should be in pencil, shaded fully and covers 2/3 of space given. Ruler should be used.

36b. *Note : Pupils need to apply what they have learnt to the situation given. How shadow of Object X is formed on the wall?*

  Answer : Light from torch at Position F *(be specific as there are 2 torches given in the diagram)* is blocked by object X so a shadow is cast on the wall.

37a. Answer : Place object S nearer to each other.

Incorrect answer : Place more object S on the belt (*this does not increase the counting if the speed is not changed or the distance between the objects remains the same)*

Place more scanner and sensor (*this will create more confusion in counting rather than counting more)*

37b. *Note : correct property of light has to be given not any property of light.*

Answer : Light travels in a straight line.

Light can be blocked by an opaque object.

37c. *Note : Light has to be blocked by object S before it can be counted.*

Answer : The **light produced by the scanner cannot be blocked by object S** if it is below 4cm, and it will not be scanned and recorded by the counter.

38b. *Note : Straw is inside the test tube so air blown in will be released in the test tube. The test tube has to be filled with air first before bubbling will be seen on the water surface.*

Answer : The test tube is already filled with water so the excess air that that is blown in escape as bubbles out of the water.

39a. X — water level is above the hole with some air trapped in the cup. *(it is just like a shorter cup with its opening at the hole)*

Y — same level as water level in the container

Z — water level is below water level in container with air trapped in the cup.

Note : Water level **MUST** be drawn in **pencil** using a **ruler**

39b. *Note : Correct property must be stated.*

Unacceptable property : Water has definite volume. Water cannot be compressed. *(these are not demonstrated in this experiment)*

40. Answer : Water and cloth are both matter and have mass. The wet cloth will have greater mass than the dry cloth.

Note : Terms 'heavier' and 'lighter' are for weight comparison. For mass, 'greater mass' or 'less mass' is used.