

**PRELIMINARY EXAMINATION
2016**

Section A	60
Section B	40
Your score out of 100 marks	
Parent's signature	

Name : _____ Index No: _____ Class: P 6 _____

25 Aug 2016

SCIENCE

Attn: 1h 45min

SECTION A (30 X 2 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 on the Optical Answer Sheet.

1. The table below provides some information on organisms X, Y and Z.

A tick (✓) in the box indicates the presence of the characteristics.

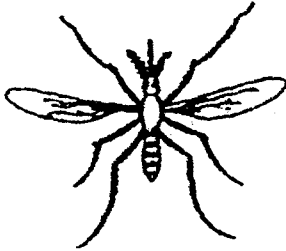
Organisms	Makes its own food	Feeds on dead matter	Reproduces from spores
X	✓		✓
Y		✓	✓
Z		✓	

What are X, Y and Z most likely to be?

	X	Y	Z
(1)	mushroom	bacteria	bird's nest fern
(2)	bird's nest fern	mushroom	bacteria
(3)	bacteria	mushroom	bird's nest fern
(4)	bird's nest fern	bacteria	mushroom

2. Which one of the following animals is **not** an insect?

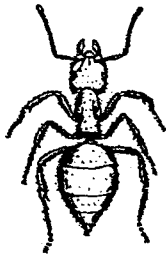
(1)



(2)



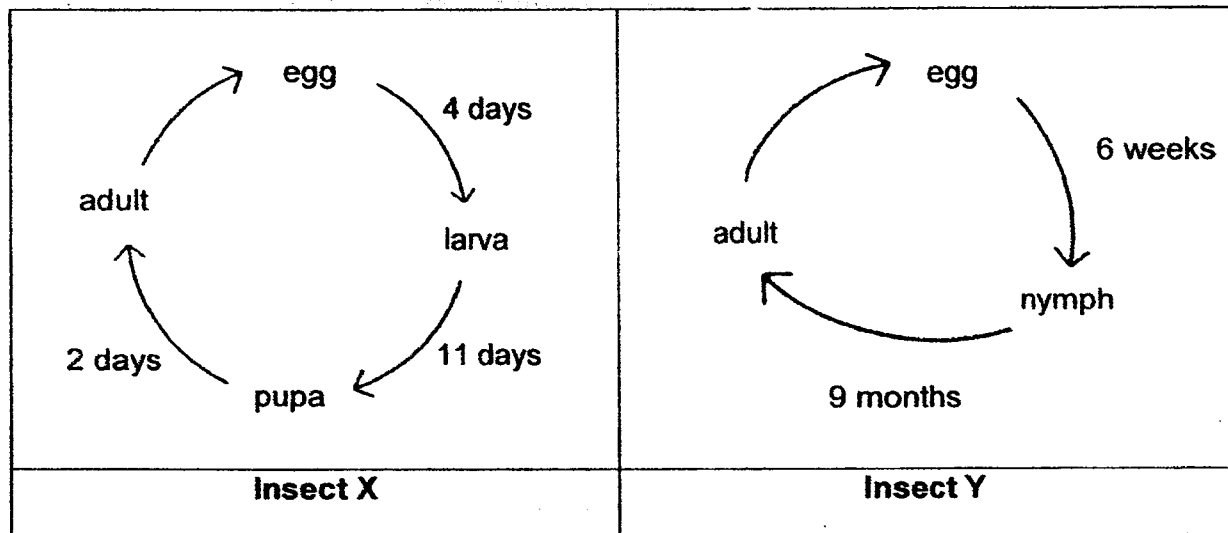
(3)



(4)



3. Study the life cycles of insects X and Y below.

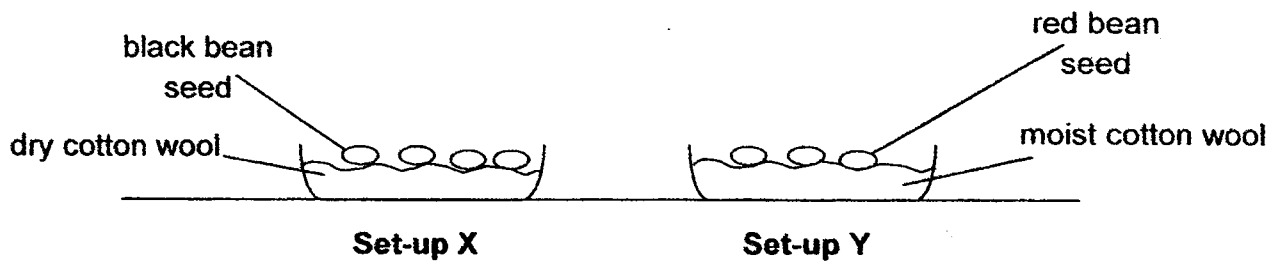


Based on the diagrams above only, which of the following statements are true?

- A X and Y do not give birth to their young alive.
- B X and Y have different number of stages in their life cycles.
- C The young of Y resembles its adult but the young of X does not.
- D The young of X takes a longer time to develop into the adult stage than the young of Y.

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

4. Jenny conducted an experiment to find out if the presence of water would affect seed germination. She prepared the experimental set-ups as shown below.

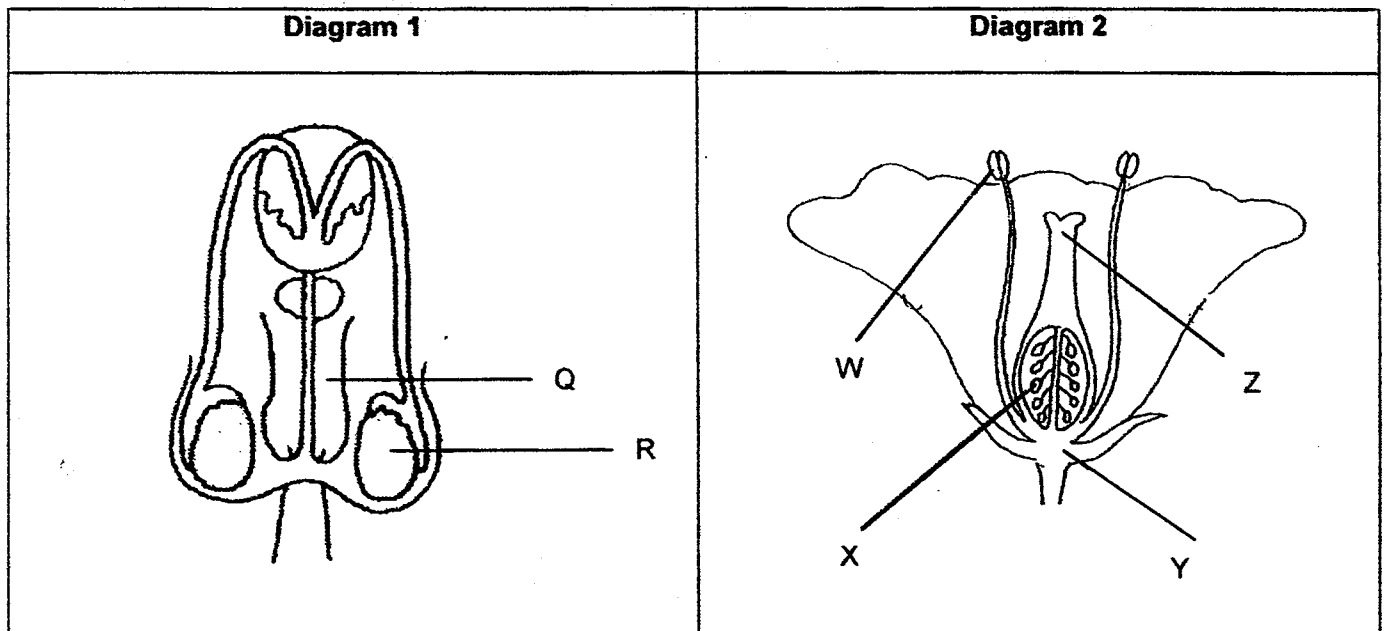


Her classmates commented that her experimental set-ups were incorrect.

Which of the following should she do to ensure a fair test?

- A Add one more seed to set-up Y.
 - B Add water to the cotton wool in set-up X.
 - C Reduce the amount of cotton wool in set-up X.
 - D Replace the black bean seed in set-up X with red bean seeds.
-
- (1) A and B only
 - (2) A and D only
 - (3) B and D only
 - (4) C and D only

5. Diagrams 1 and 2 show the reproductive parts of a human and a plant respectively:



Identify the part where the male sex cells are produced in the reproductive system of a human and plant respectively.

	Reproductive system of human	Reproductive system of plant
(1)	Q	X
(2)	Q	Z
(3)	R	W
(4)	R	Y

6. The diagrams below show the parts of a river bank. Diagram 1 shows the areas where two different types of plants, A and B, were introduced in 2015, while Diagram 2 shows the same river bank and the growth of the plants in some other areas of the land in 2016.

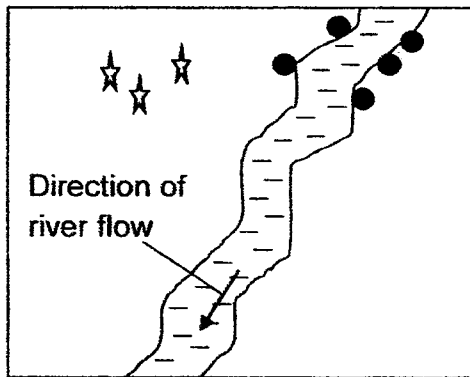
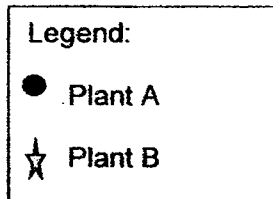


Diagram 1
(Year 2015)

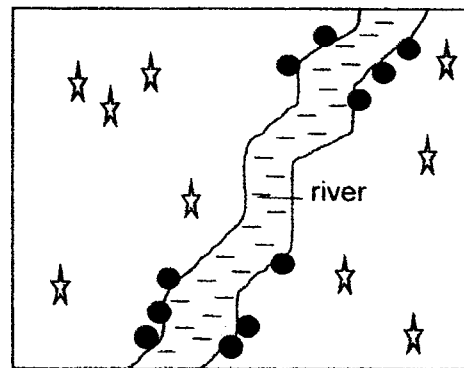
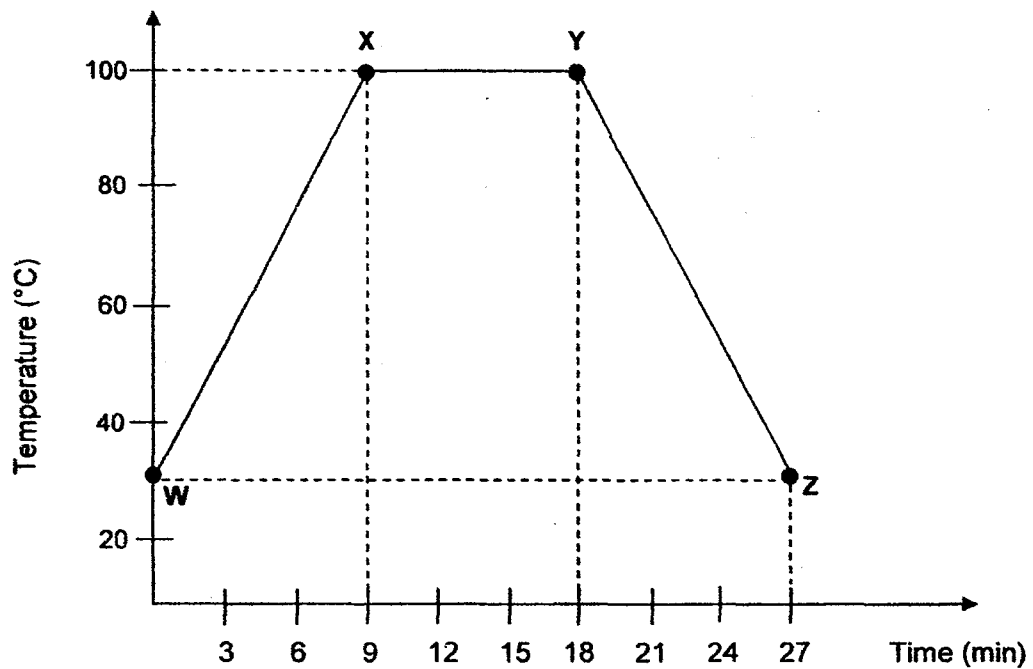


Diagram 2
(Year 2016)

Based on the diagrams above, which one of the following shows the possible characteristics of the fruits of Plants A and B?

	A	B
(1)	Has hooks	Has fibrous husk
(2)	Has wing-like structure	Is brightly coloured and juicy
(3)	Has stiff hairs	Has wing-like structure
(4)	Has fibrous husk	Is small and light

7. Mary heated some water in a beaker until it boiled. The results of her experiment are recorded in the graph below.



Based on the information above, which of the following statements correctly describes what happened to the water at the different stages?

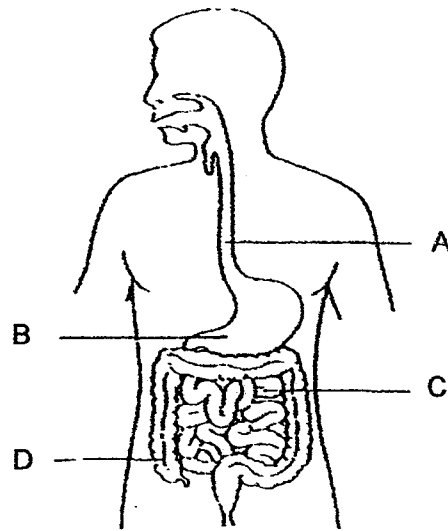
- A Evaporation takes place only from Y to Z.
- B The water in the beaker gained heat energy from W to X.
- C Mary heated the water in the beaker for more than 20 minutes.
- D The water in the beaker started to boil after it had been heated for 18 minutes.

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

8. The lungs and heart are two organs in the human body. Which one of the following statements on the function of the lungs or heart is correct?

- (1) The heart removes carbon dioxide from the lungs.
- (2) The heart takes in oxygen from the surrounding air into the body.
- (3) The lungs remove carbon dioxide from the body when we breathe out.
- (4) The lungs transports oxygen from the heart to the other parts of the body.

9. The diagram below shows the digestive system of a human body.



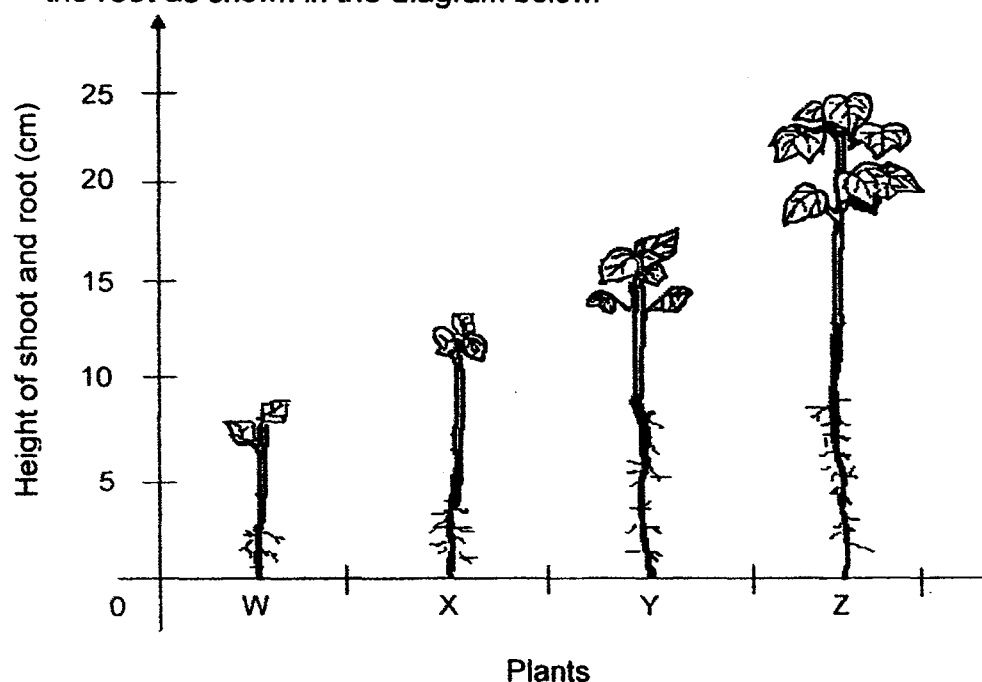
Digestion is completed at _____.

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

10. Peter wanted to find out how the length of the root affected the growth of plants. He planted four similar plants, W, X, Y and Z. He added the same amount of water to the plants. The table below shows when each plant was harvested.

Plant	Day on which the plant was harvested
W	10 th
X	20 th
Y	30 th
Z	40 th

He then recorded the height of the plant, number of leaves and the length of the root as shown in the diagram below.

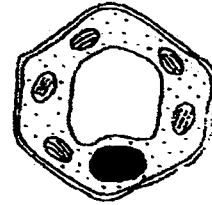
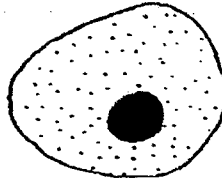
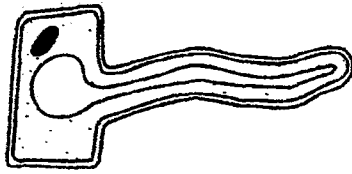


Based on the information above, which of the following conclusions are correct?

- A As the length of the root increases, the height of the plant increases.
- B As the length of the root increases, the number of leaves increases.
- C The longer the length of the root, the greater the volume of water the plant was able to absorb.

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

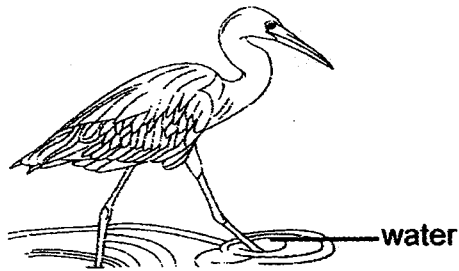
11. Study the three cells below.



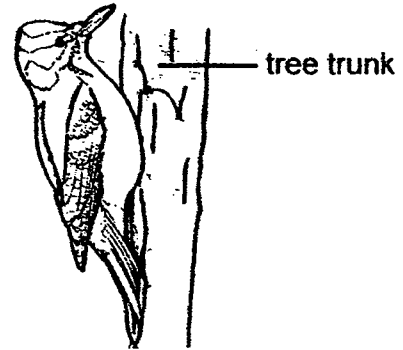
Which of the following cell parts are found in all three cells?

- (1) cell wall and nucleus only
- (2) nucleus and cell membrane only
- (3) cytoplasm and cell membrane only
- (4) cytoplasm, nucleus and cell membrane only

12. Jack saw two different types of birds, Y and Z. Bird Y was seen feeding in the pond while bird Z was seen feeding on the tree trunk. Bird Y waddled through shallow waters and does not swim. Bird Z perched on the tree trunk and feed on tiny organisms.

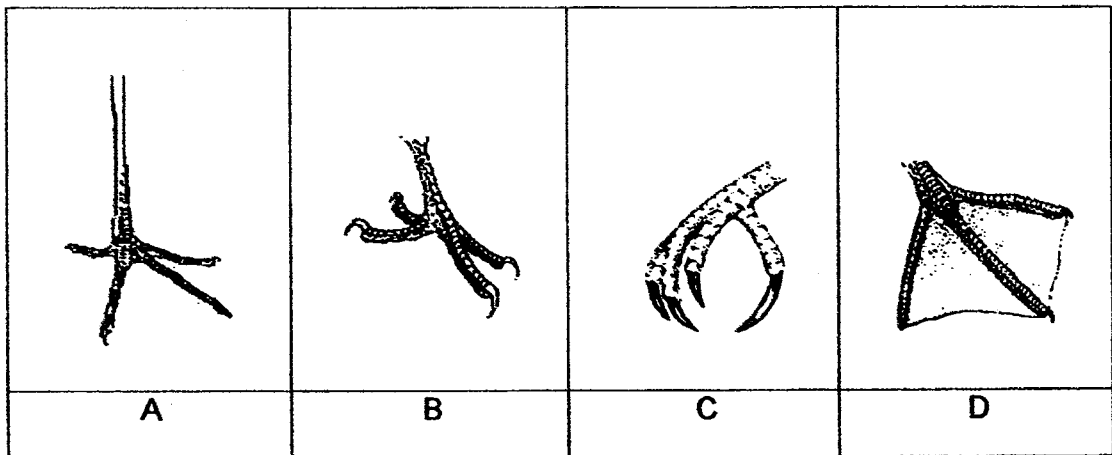


Bird Y



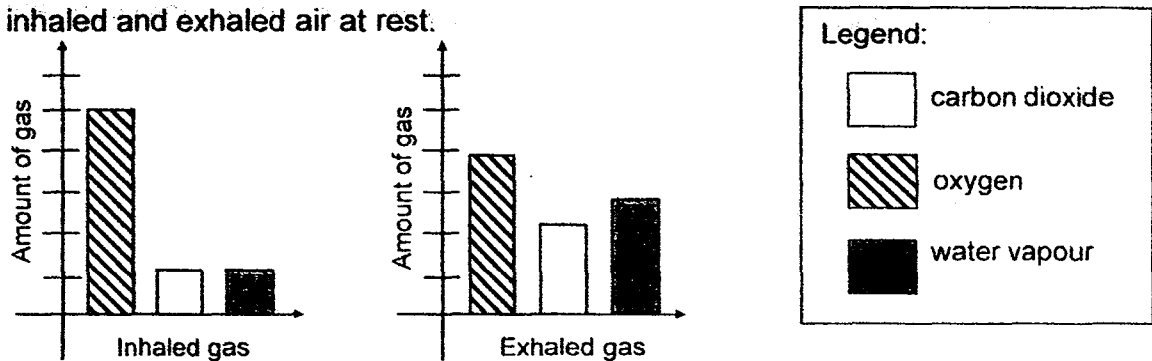
Bird Z

Which of the bird feet, A, B, C and D shown below represents the feet of bird Y and Z?

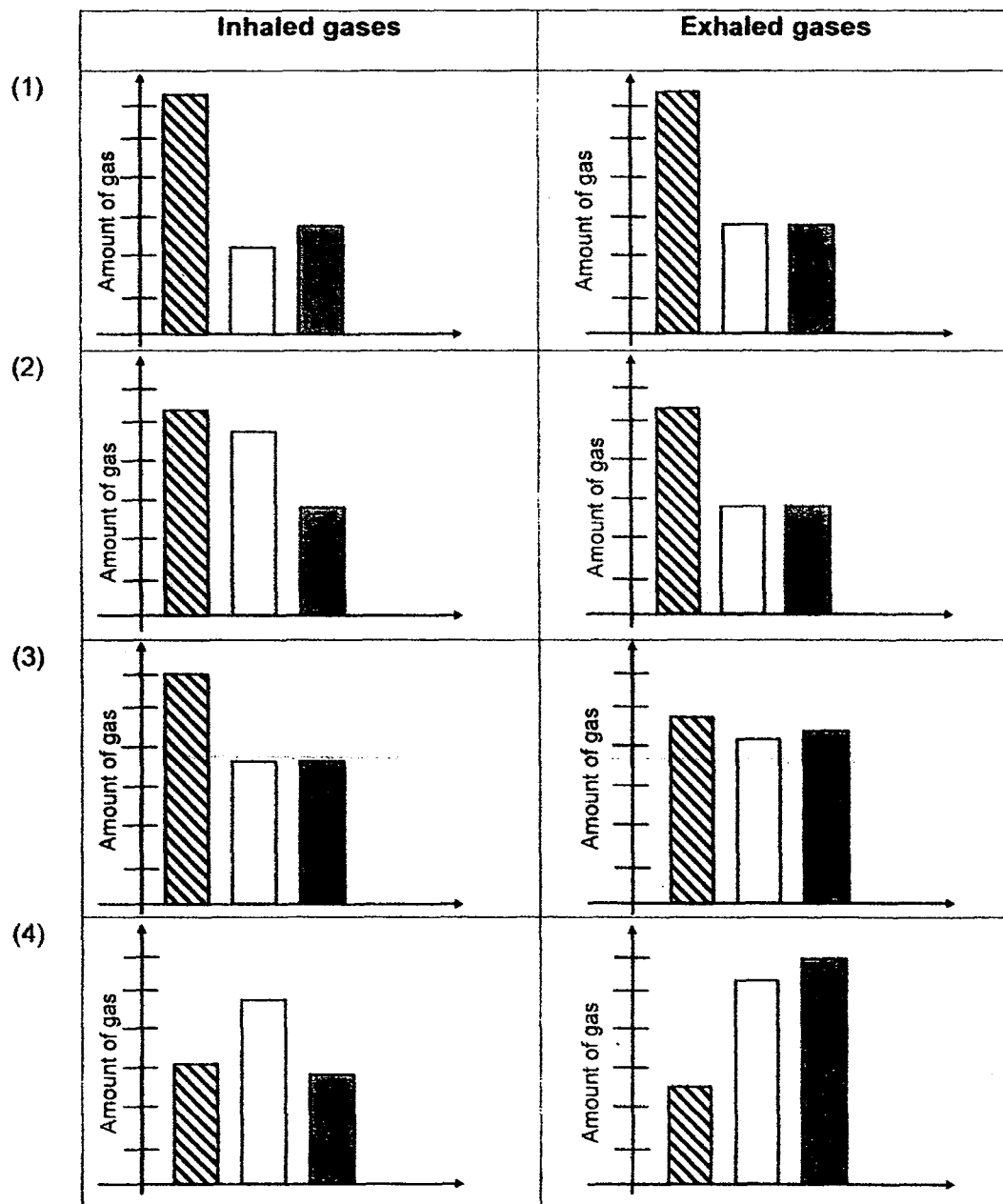


	Bird Y	Bird Z
(1)	A	B
(2)	A	C
(3)	D	C
(4)	B	D

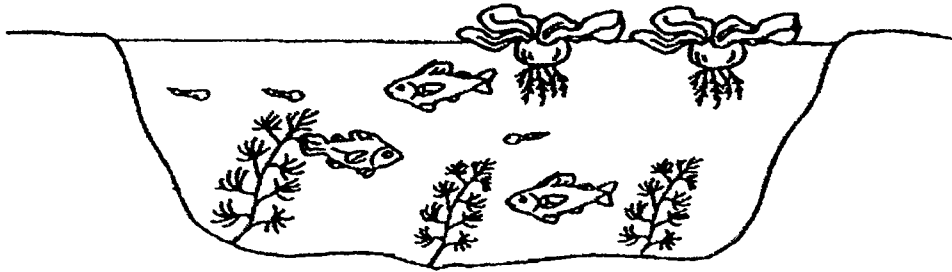
13. Mary was trapped in a small lift. She started to kick the lift door and shout for help continuously. The graph below shows the percentage of gases in Mary's inhaled and exhaled air at rest.



Which one of the following graphs below shows the percentage of gases in Mary's inhaled and exhaled air after 15 minutes in the lift?



14. The diagram below shows an aquatic habitat.



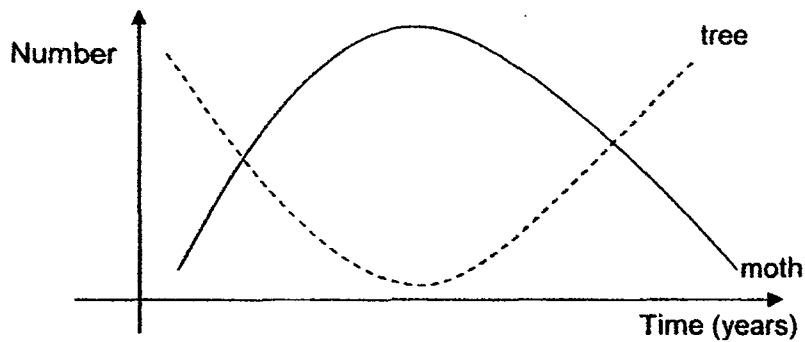
Four friends made the following statements about the aquatic habitat.

- A There are a total of two different populations in the aquatic habitat.
- B The fishes and the tadpoles form two communities in aquatic habitat.
- C The tadpoles, fishes and aquatic plants form one community in the aquatic habitat.
- D The tadpoles, fishes and aquatic plants form three different populations in the aquatic habitat.

Which of the above statements is/are correct?

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

15. The table below shows the changes between the number of moths and the number of trees in the forest over a period of 5 years.



Based on the table above, which of the following reasons possibly explain for the changes in the population of moths and trees over a period of 5 years?

- A The trees provides food for the moths.
 - B The number of trees decreased due to a fire in the forest.
 - C The number of moths increases faster than the number of trees.
 - D As the number of moths decreases, the number of trees increased.
- (1) A and B only
 - (2) A and D only
 - (3) B and C only
 - (4) C and D only

16. The characteristics of a desert frog are listed below:

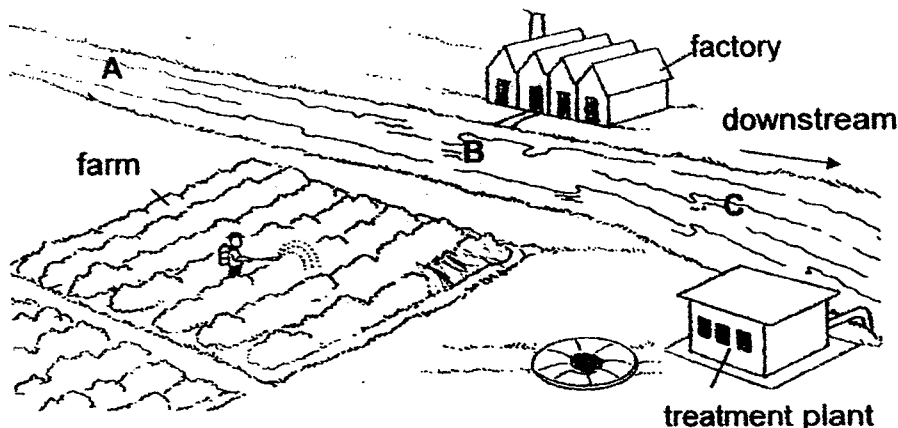
- feeds in the day
- hides in its burrow at night.
- stays in the burrow when the temperature rises above 40°C.

Which of the following statements explain the above behaviour of the desert frog?

- A Availability of water in the burrow.
B Availability of prey above the ground in the day.
C Availability of shelter to hide from predators in the burrow:

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

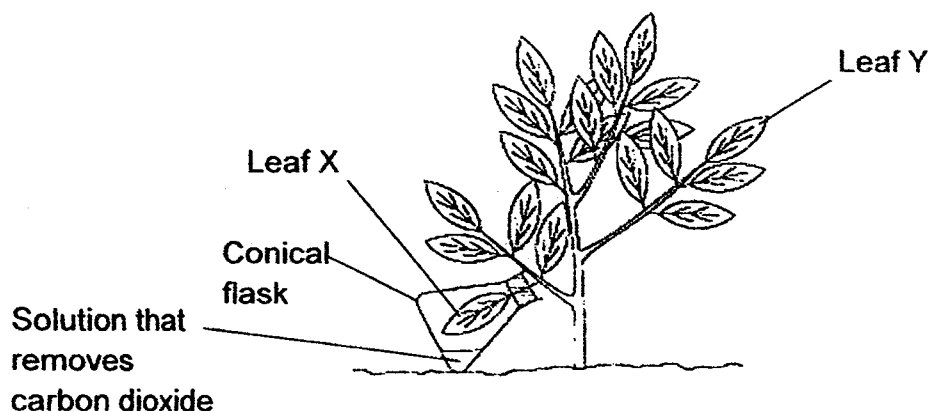
17. Pollution affects the environment. The diagram below shows three points, A, B and C, of the river.



Which points, A, B and/or C will be the most polluted?

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

18. Siti set up an experiment to find out if carbon dioxide is needed for photosynthesis. She placed a plant in a dark room for two days and then moved it to the school garden. She inserted one of its leaves, Leaf X, in a conical flask containing a solution that removes carbon dioxide as shown in the diagram below.



After 6 hours, Siti removed leaves X and Y from the plant, discoloured the leaves and then tested them for starch using iodine.

Which one of the following correctly shows the results of Siti's experiment?

Colour of iodine on leaves		
	Leaf X	Leaf Y
(1)	yellowish-brown	yellowish-brown
(2)	blue-black	blue-black
(3)	yellowish-brown	blue-black
(4)	blue-black	yellowish-brown

19. Marie conducted an experiment using three rods, A, B and C and four bars made of materials W, X, Y and Z. She used each rod to scratch each bar. Her observations are shown in the table below.

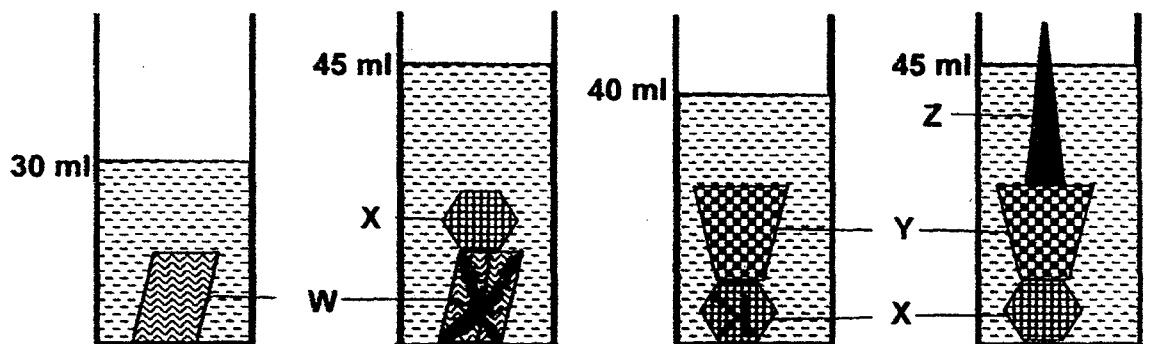
A tick (✓) indicates the presence of scratch marks on the bar.

		Scratch marks observed on bar			
Rod	Material of Bar	W	X	Y	Z
A		✓		✓	✓
B					✓
C				✓	✓

Based on Marie's experiment, which material, W, X, Y or Z, is most suitable for making a safety helmet?

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

20. Germaine poured an equal amount of water into four similar measuring cylinders. She then placed four blocks, W, X, Y and Z, in the cylinders in the following order.



Which of the following statements are definitely correct?

- A The volume of block Z is 5 ml.
- B The volume of block X is 15 ml.
- C The original volume of water was 20 ml.
- D The volume of block W is greater than the volume of block Y.

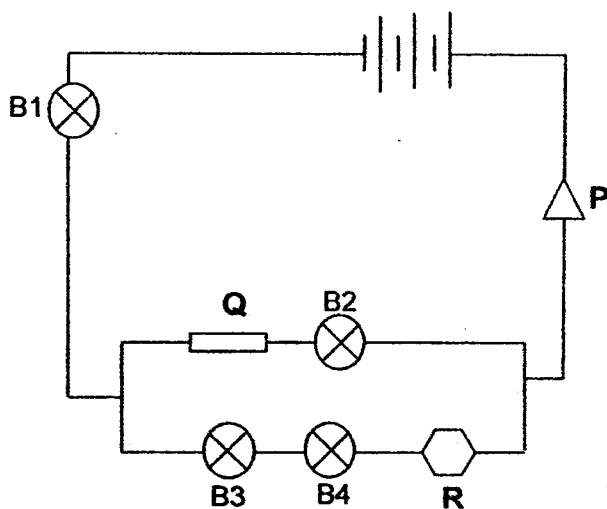
- (1) A and C only
 - (2) B and D only
 - (3) C and D only
 - (4) A, B and D only
21. Cheryl has a container filled with a mixture of two substances, X and Y. The table below shows the melting point and boiling point of the substances.

Substance	Melting point ($^{\circ}\text{C}$)	Boiling point ($^{\circ}\text{C}$)
X	217	700
Y	420	900

At what temperature should Cheryl heat the mixture such that one substance becomes a liquid and the other substance becomes a solid?

- (1) 300°C
- (2) 500°C
- (3) 800°C
- (4) 900°C

22. Study the circuit diagram below carefully. Materials P, Q and R were connected to the circuit below.

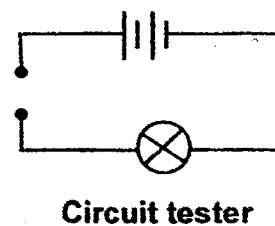


Which one of the following most likely represents the materials, P, Q and R, and the number of bulbs that lighted up?

	P	Q	R	Number of bulbs that lighted up
(1)	steel	glass	aluminium	4
(2)	aluminium	iron	glass	3
(3)	glass	copper	steel	2
(4)	copper	glass	iron	3

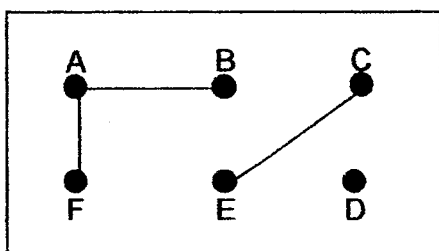
23. A circuit card with six metal pins, A, B, C, D, E and F, are connected by wires on its underside. It is tested with a circuit tester and the results are recorded below.

Metal pins connected to the circuit tester	Did the bulb light up?
A and B	no
A and F	yes
B and D	no
C and E	no
D and E	yes

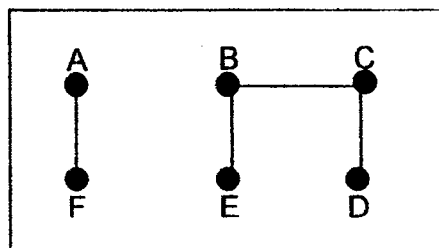


Which one of the following correctly identifies the circuit card used?

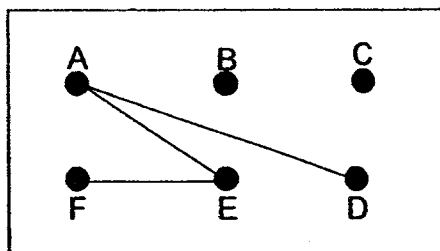
(1)



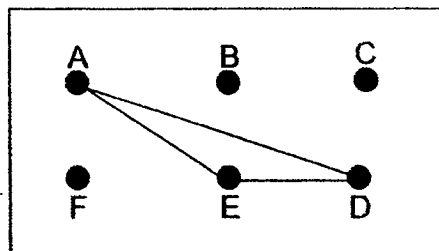
(2)



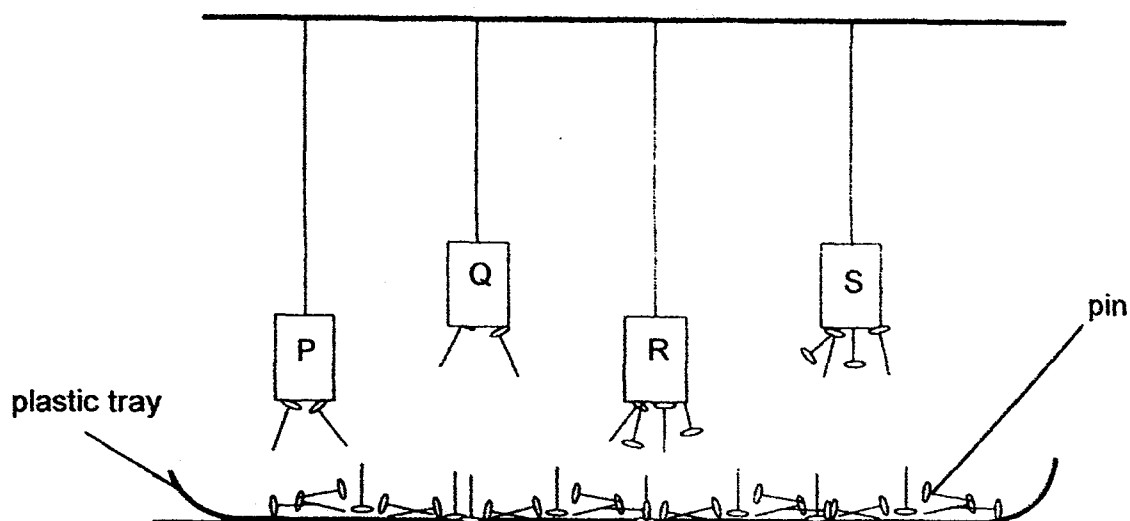
(3)



(4)



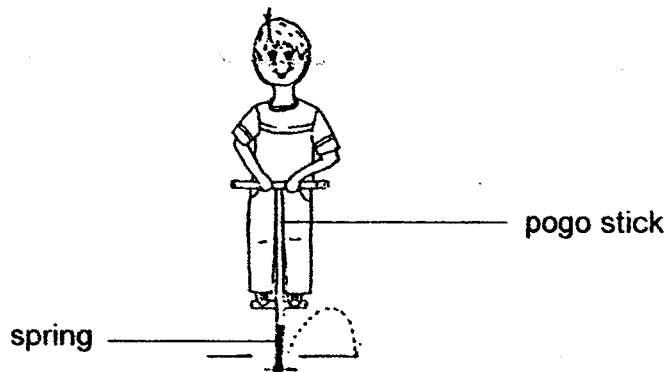
24. Wendy hung four magnets, P, Q, R and S, above a tray of identical iron pins. Her observation is shown below.



Which of the following statements are correct?

- A Magnet S is the strongest magnet.
 - B Magnet P is weaker than Magnet R.
 - C Magnet R is stronger than Magnet Q.
 - D Both Magnets P and Q have the same strength.
-
- (1) A and B only
 - (2) B and D only
 - (3) A, B and C only
 - (4) A, C and D only

25. Tom is riding on his pogo stick as shown below.

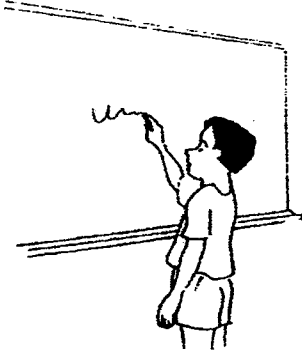
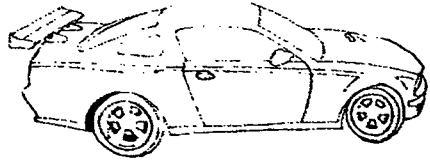
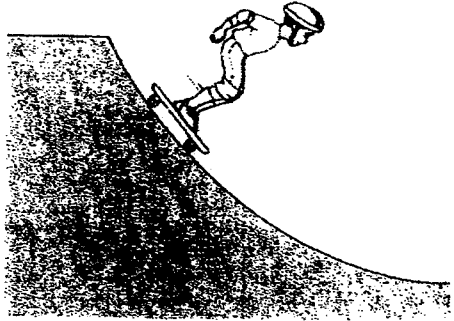
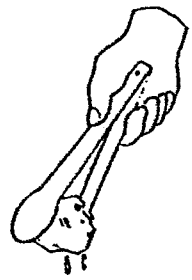


Which of the following statements is/are correct?

- A Gravitational force increases as Tom jumps into the air.
- B There is gravitational attraction between Tom and the Earth.
- C Only elastic spring force is needed for Tom to move over a distance.

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

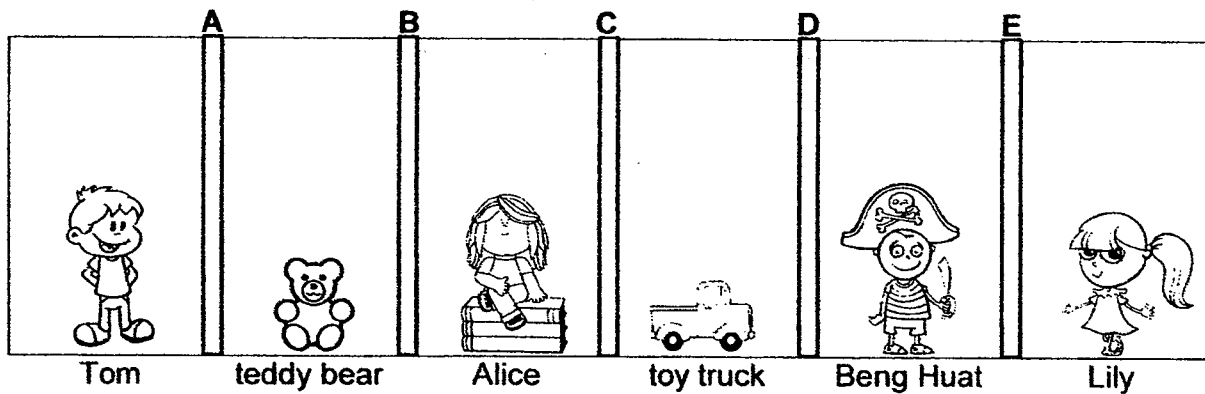
26. The diagrams below show four examples of forces in our daily life.

 <p>(A) Writing on the white board</p>	 <p>(B) A stationary car on level ground</p>
 <p>(C) Skateboarding down a ramp</p>	 <p>(D) Using tongs to pick up an ice cube</p>

Which of the following has friction acting on it?

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

27. Study the diagram below.



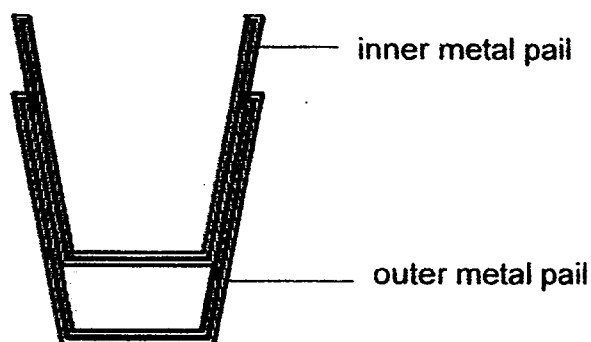
Four children and two of their toys are separated by screens, A, B, C, D and E. Given that the screens are made of different materials,

- Tom is unable to see Alice.
- Lily is unable to see the toy truck.
- Alice can see both the teddy bear and the toy truck.

Based on the information above, which one of the following could possibly be the materials which have been used to make the screens?

	A	B	C	D	E
(1)	clear plastic	metal	clear plastic	wood	clear glass
(2)	wood	clear plastic	clear glass	metal	clear plastic
(3)	clear plastic	clear glass	metal	wood	clear glass
(4)	metal	metal	wood	clear plastic	clear glass

28. Gopal always has difficulty separating two metal pails which are stacked together as shown in the diagram below.

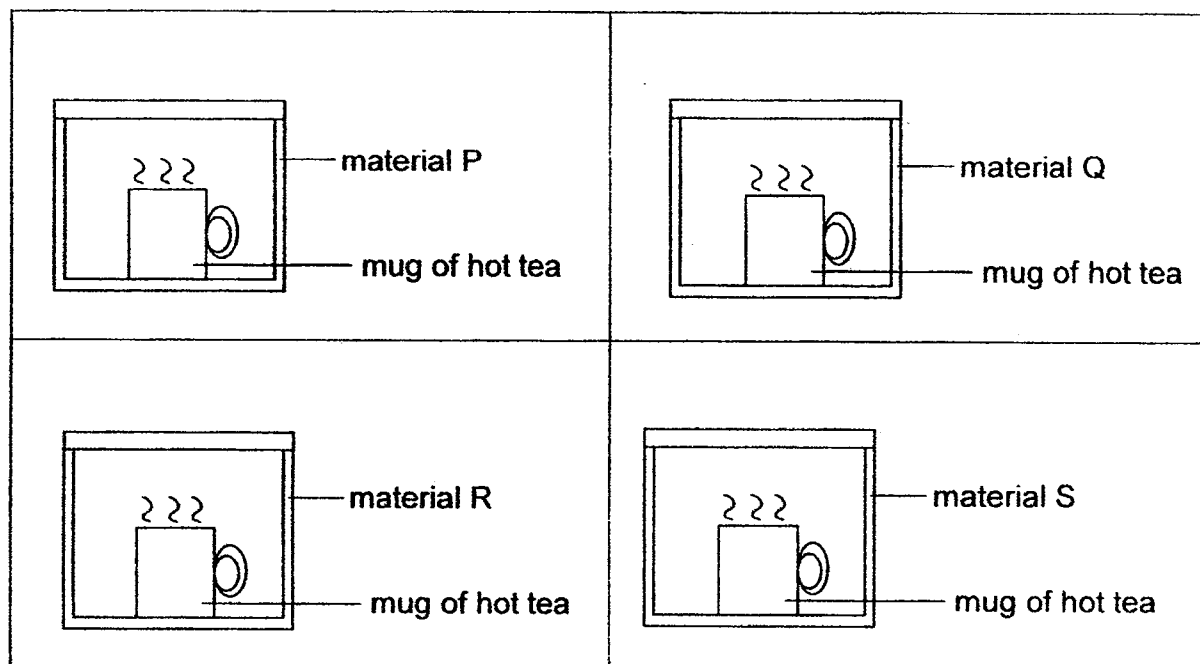


Which one of the following ways is the best in separating the two pails easily?

- A Pour hot water into the inner pail.
- B Pour cold water into the inner pail.
- C Place the outer pail in a tub of hot water.
- D Place the outer pail in a tub of cold water.

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

29. Four mugs of hot tea of the same temperature were placed inside four boxes which were made of different materials, P, Q, R and S, as shown in the diagrams below.



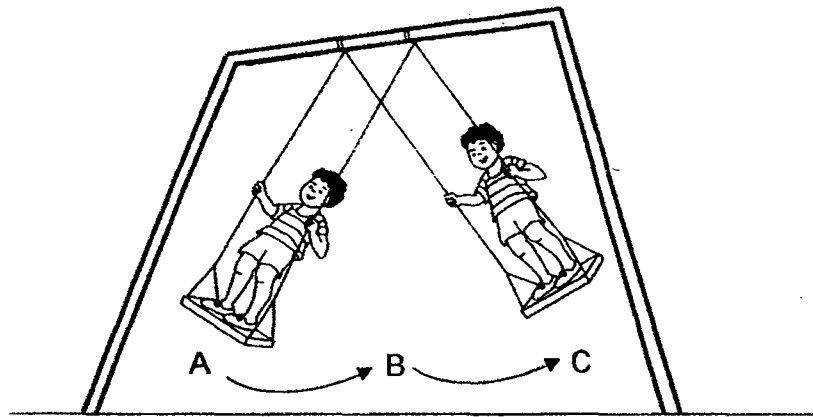
The time taken for the hot tea to reach room temperature of 30°C was recorded in the table below.

Materials	Time taken to reach room temperature (min)
P	25
Q	51
R	38
S	46

Which one of the materials is the most suitable to be used to make a container which can keep a bottle of water cold for the longest time?

- (1) P
- (2) Q
- (3) R
- (4) S

30. Denny was playing on a swing as shown in the diagram below.



Which one of the following statements is true when Denny swung from position A to B and then to C?

- (1) The potential energy at A, B and C are the same.
- (2) Potential energy was the highest at A and was lost at B.
- (3) Kinetic energy increased from A to B and again from B to C.
- (4) Kinetic energy increased from A to B and decreased from B to C.

Name : _____ Index No : _____ Class : P6 _____

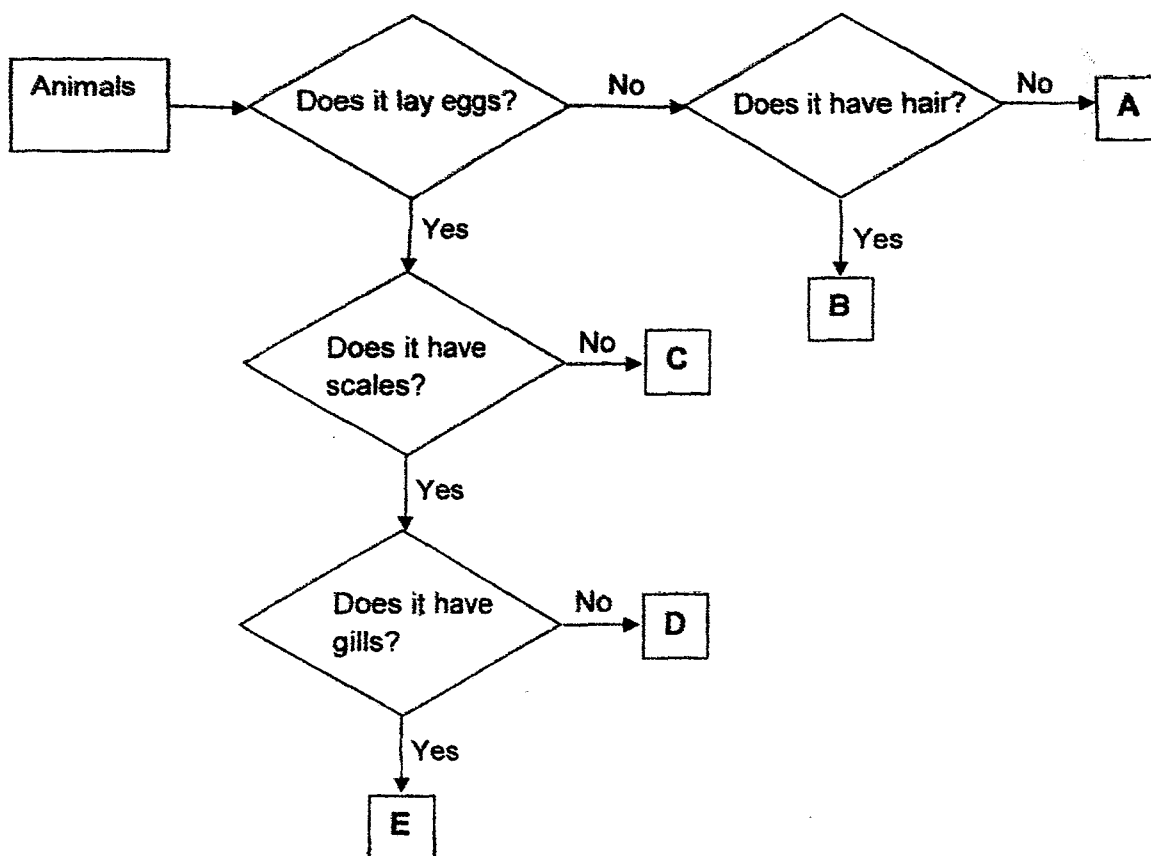
40

SECTION B (40 marks)

For questions 31 to 44, write your answers clearly in the spaces provided.

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

31. The flowchart below shows the characteristics of five different animals represented by letters A, B, C, D and E.



Based on the flowchart, answer the following questions.

- (a) Name one difference between Animals A and D.

[1]

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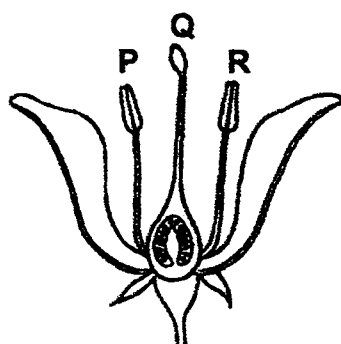
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- (b) State two characteristics of Animal C. [1]

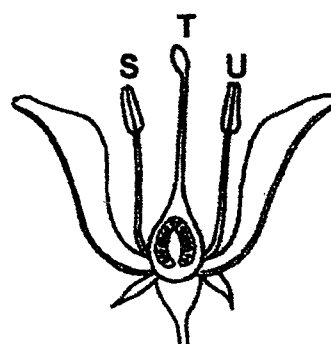
- (c) Which group of animals does Animal E belong to? [1]

Score	<div style="border: 1px solid black; width: 100px; height: 50px; position: relative;"><div style="position: absolute; top: 0; right: 0;">2</div></div>
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32. The diagram below shows two flowers, X and Y, growing on a plant.



Flower X



Flower Y

Mary studied the flowers and wrote down the following in the table below.

Pollination takes place when pollen grains are transferred from	
	P to Q
	T to P
	R to Q
	U to T
	S to T
	Q to U

Mary's teacher told her that she had made two mistakes.

Which two mistakes did Mary make in the table above?

- (a) Pollination does **not** take place when pollen grains are transferred from

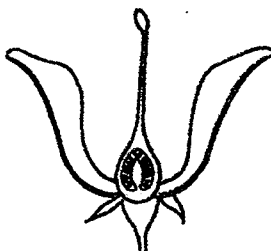
_____ to _____ and _____ to _____. [1]

continue on the next page

Score	1
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Mary wanted to find out if a fruit can be developed from a flower when a certain part of the flower is removed. She removed only a certain part from flower X on the plant as shown below.

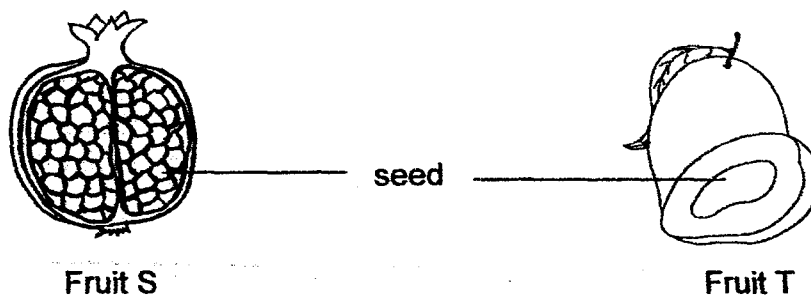


Flower X with a missing part

Mary then dusted pollen grains from the same type of flower over flower X on the plant. She observed the flower over a few weeks.

- (b) Is flower X likely to develop into a fruit? Explain your answer. [2]

The diagrams below show two fruits, S and T, that Mary has cut open.



- (c) Based on the diagrams above, what can Mary infer about the number of ovules in the flower of fruit S and fruit T respectively? [1]

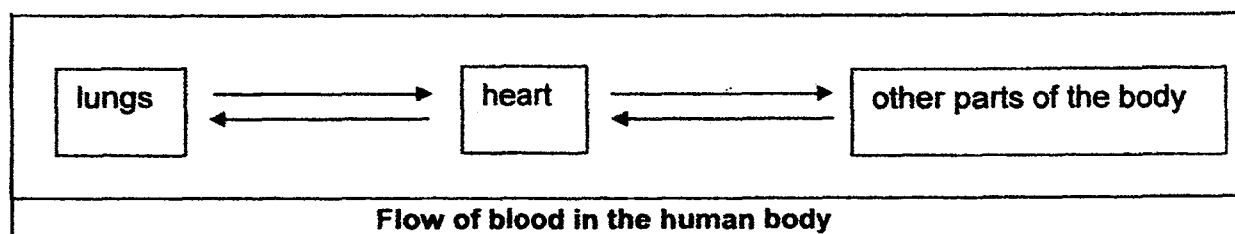
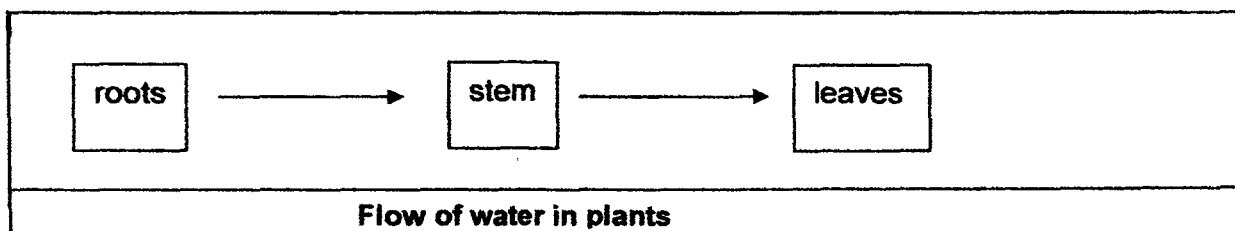
Score	3
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33. Sarah made the following observations on different plant parts, A, B, C and D on a plant.

Parts of a plant	Observations
A	contains starch
B	absorbs water and dissolved mineral salts
C	holds the plant upright and has two types of tubes to transport substances
D	traps light and makes food

- (a) Describe how part C helps in the growth of the plant. [1]

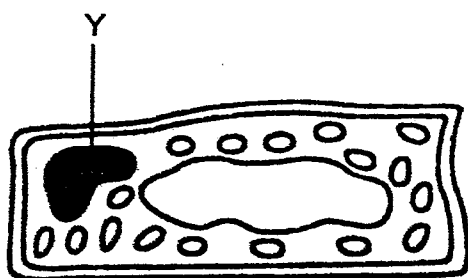
- (b) The diagrams below show the movement of water in a plant and the movement of blood in a human body.



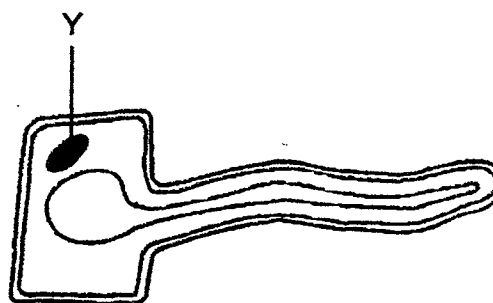
State a difference between the direction of the movement of water in the plant and the direction of movement of blood in the human body. [1]

Score	2
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34. Siew Qi observed the two different types of cells, A and B, as shown in the diagrams below.



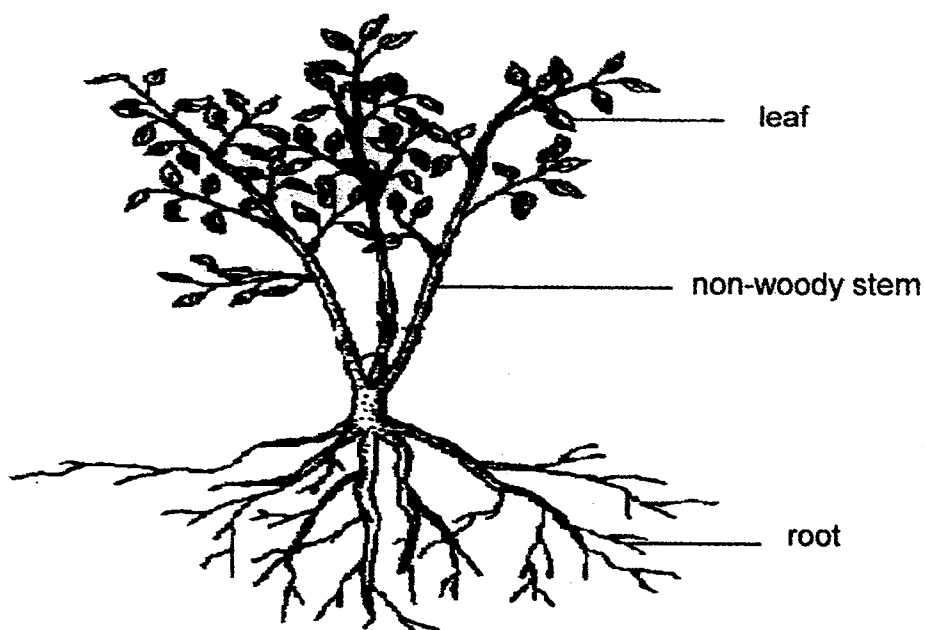
Cell A



Cell B

- (a) What is the function of Y?

[1]

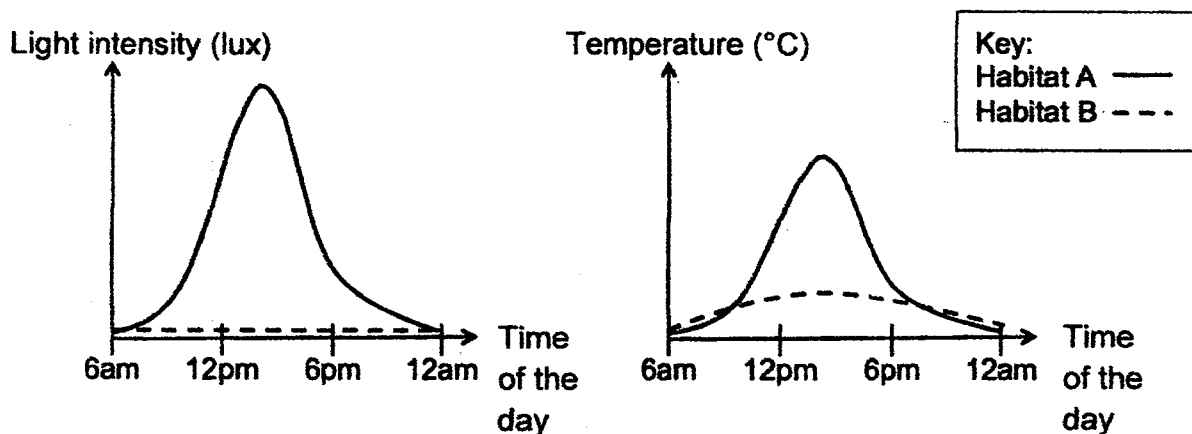


- (b) In which part of the plant shown above are you most likely to find cell B? Give a reason for your answer.

[1]

Score	2
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- 35 Kathy used a data logger to measure the light intensity and temperature of the surrounding air in two different types of habitat, A and B, in her school. She then plotted her data as shown below.



- (a) Based on the graph above, suggest a possible habitat for A and B. [1]

Habitat A: _____

Habitat B: _____

- (b) Based on the graph above, what is the relationship between the light intensity and temperature for habitat A? [1]

Score	2
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- (c) Kathy then counted and recorded the number of organisms X, Y and Z in two areas in one of the habitats at 1pm. She also observed that both organisms X and Y fed mainly on dead leaves while organism Z fed on small organisms. None of the organisms left the habitat.

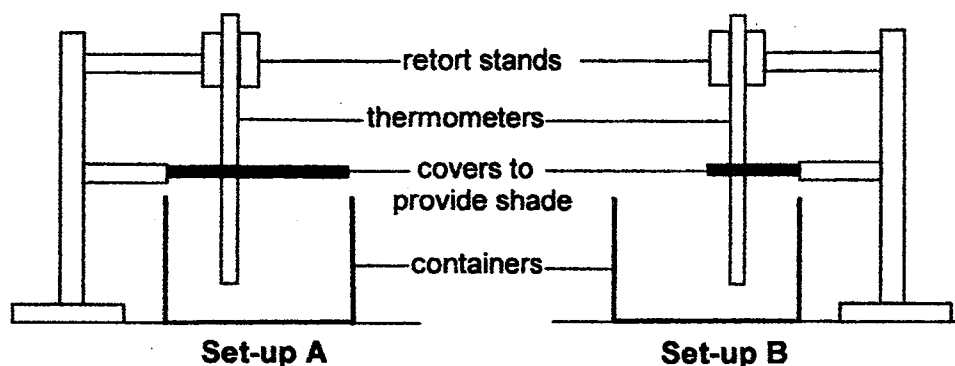
	Number of organisms		
	X	Y	Z
Area 1	15	25	1
Area 2	3	10	5

- (i) Based on the information above, what is the most possible reason for the difference in the number of organisms X and Y in the two areas in the same habitat. [1]

- (ii) Write a possible 3-linked food chain involving organisms X and Z. [1]

Score	2
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36. Ben prepared set-ups A and B as shown in the diagrams below. He placed both set-ups under the sun. The temperature of the air within the containers in both set-ups were measured using a thermometer and recorded at different times of the day.



Ben's results are shown in the table below.

Part of the day	Average temperature of the surrounding (°C)	Temperature of air in the container (°C)	
		Setup A	Setup B
Morning	25-30	25	29
Afternoon	31-38	32	37
Evening	26-29	26	28

- (a) Based on the data above, compare the temperature of the air in the containers of set-ups A and B. [1]

Score	1
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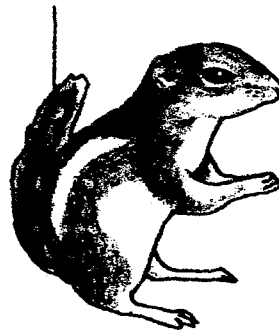
- (b) Animal Q and Animal R live in a very hot and dry habitat. The temperature in the day can be higher than 40°C with little water all year round. Both animals come out of their burrows in the day to search for food.

long and wide tail



Animal Q

short and narrow tail



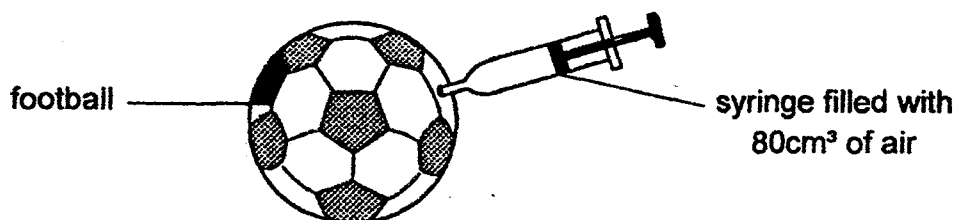
Animal R

Based on Ben's findings, explain which animal has an advantage to survive in the hot and dry habitat. Explain your answer clearly. [2]

Score	2
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37

Ashlyn has a football which can hold 350cm^3 of air. She used a 100-cm^3 syringe and removed 80cm^3 of air from the football as shown in the diagram below.



- (a) What is the volume of air in the football after the air is removed from the ball? [1]

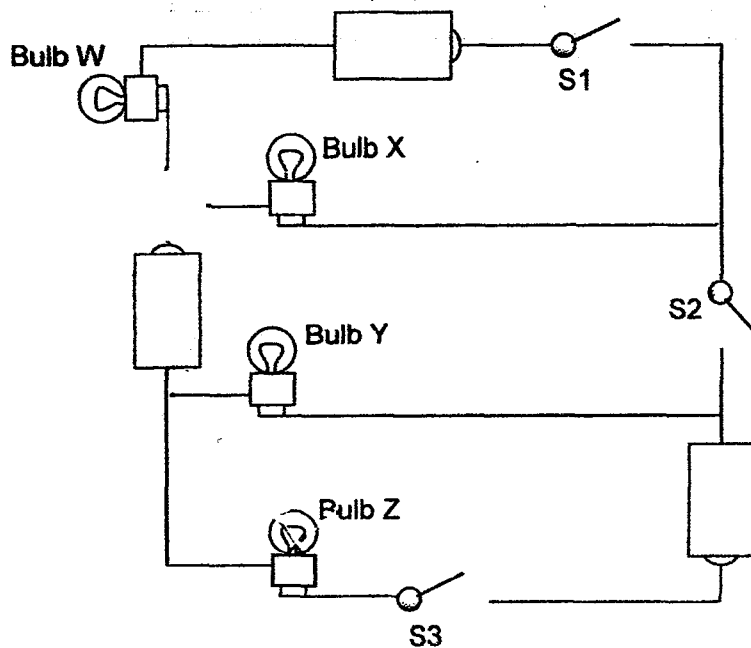
Volume of air in the football: cm^3

- (b) What property of air did you use to obtain your answer in (a)? [1]

- (c) Did the mass of the football increase, decrease or remain the same? Give a reason for your answer. [1]

Score	3
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38. Ming Ming set up an electrical circuit as shown below.



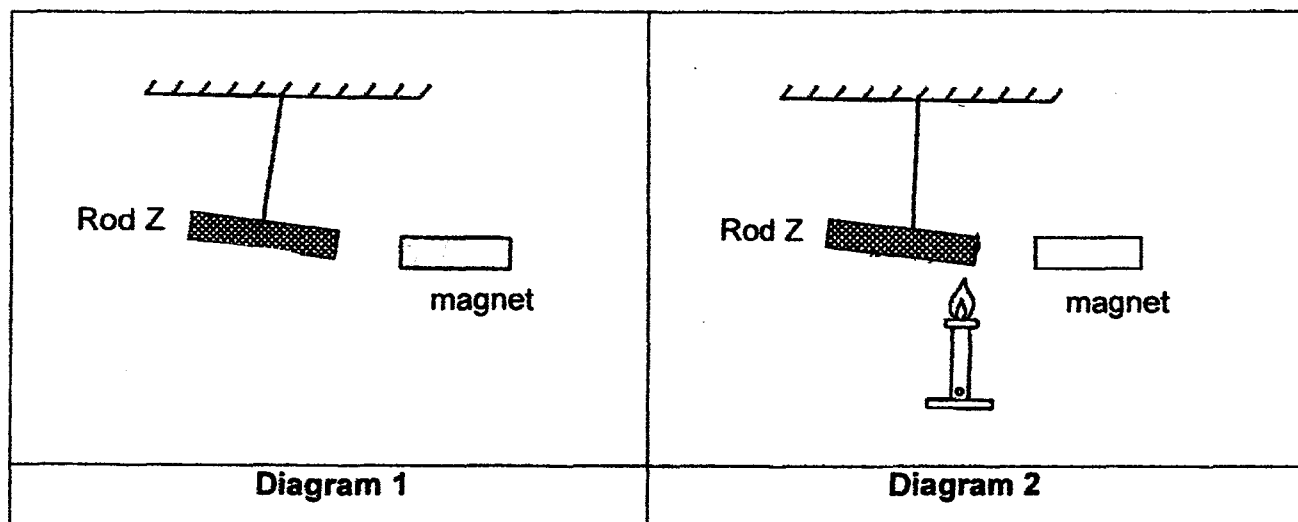
- (a) Which bulb(s) will be lighted up when all the switches in the circuit above are closed and bulb Z has fused? [1]

- (b) Given that all the bulbs are working, what is the greatest number of bulbs that can light up when any 2 of the switches, S1, S2 and S3, are closed? [1]

- (c) Ming Ming wants to add one more switch to the circuit above such that only 2 bulbs will light up when all the switches, S1, S2 and S3, are closed at the same time. Given that all the bulbs are working, **draw a cross (X)** on the circuit diagram above to show the position of the additional switch. [1]

Score	3
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39. Chris brought a magnet near Rod Z which is tied to a string as shown in Diagram 1. She then placed a flame at one end of Rod Z as shown in Diagram 2. After a while, Rod Z started to move towards the magnet.

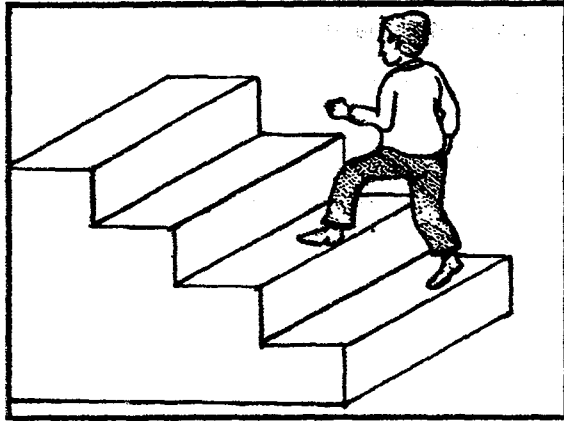


- (a) Explain why Rod Z moved away when a magnet is brought near it in Diagram 1. [1]

- (b) Explain why Rod Z started to move towards the magnet in Diagram 2. [1]

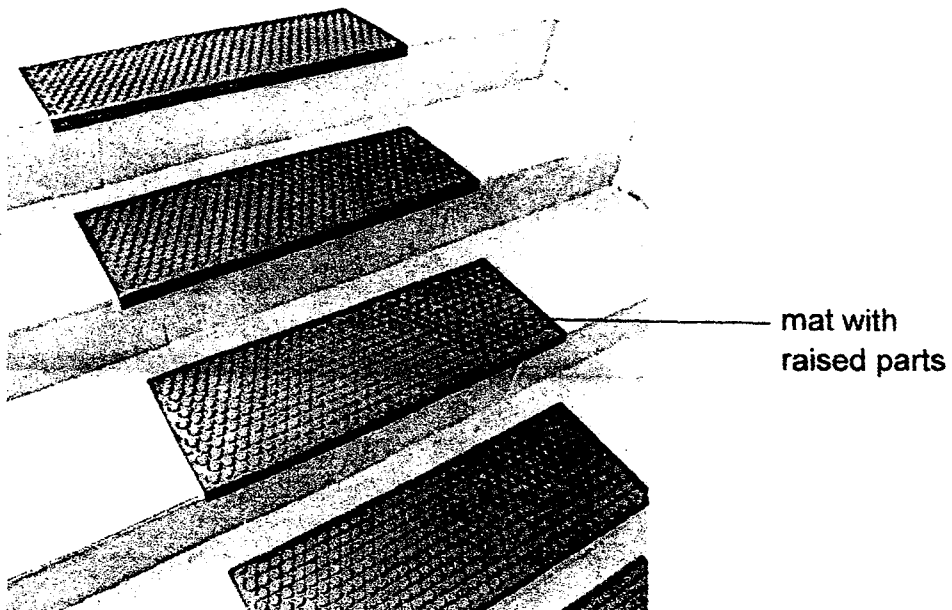
Score	2
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40. The diagram below shows Raymond walking up the stairs.



- (a) Explain why more energy is needed to walk up than walk down the stairs. [1]

Raymond put some mats on the stairs as shown in the diagram below.



continue on the next page

Score	1
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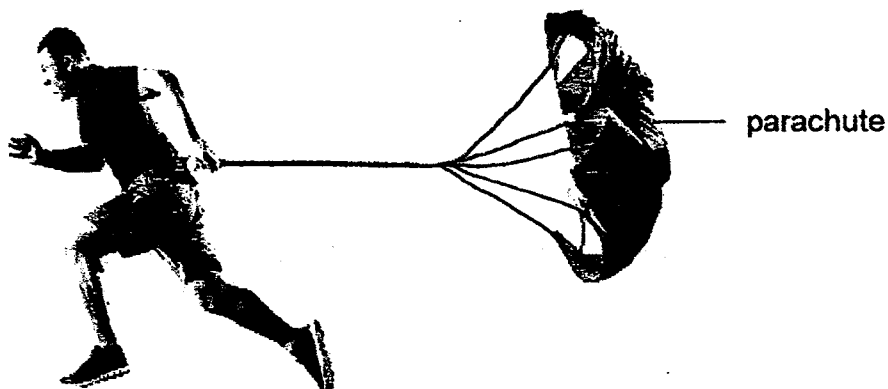
The mat has a surface made up of raised parts.

- (b) Suggest a reason for using such mats on the stairs. Explain your answer. [1]

Score	<div style="border: 1px solid black; width: 100px; height: 100px; position: relative;"><div style="position: absolute; top: 0; right: 0; width: 50%; height: 50%; border-left: 1px solid black; border-bottom: 1px solid black;"></div></div>
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41. Peter wanted to find out how the surface area of a parachute affected the time taken for him to run five metres with it.

The diagram below shows Peter running with the parachute.



Peter recorded his readings in the table below.

Surface area of parachute (cm ²)	Time taken to complete five metres (s)
900	20
1000	28
1100	34
1200	45
1300	59

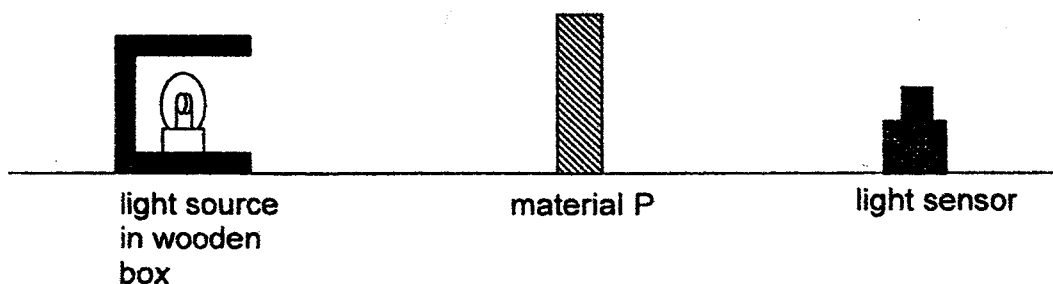
- (a) Based on the information above, what is the relationship between the surface area of the parachute and the time taken to complete the five-metre run? [1]

Peter cut a few holes on the 1300-cm² parachute and then ran with it.

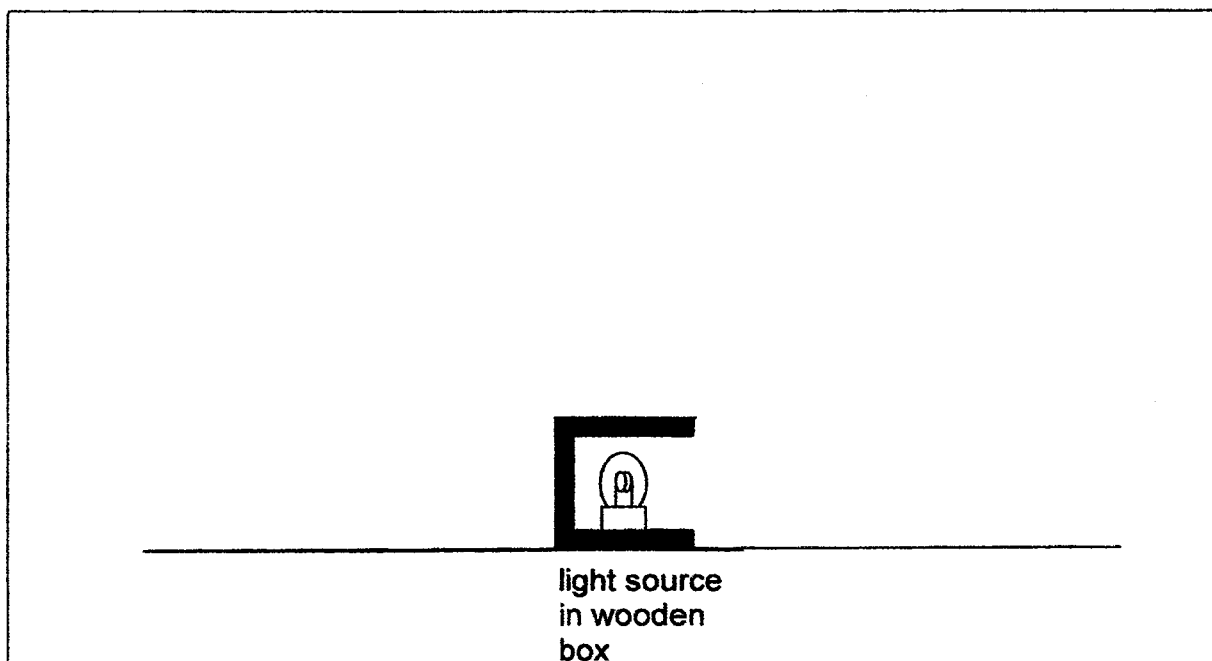
- (b) Would the time recorded for Peter to complete running 5 metres be "more than", "less than" or "the same" as 59 seconds? Explain your answer clearly. [2]

Score	<div style="border: 1px solid black; width: 100px; height: 100px; position: relative;"><div style="position: absolute; top: 0; right: 0; width: 100%; height: 100%; border-left: 1px solid black; border-bottom: 1px solid black;"></div></div>
	3

42. Tristan set up the experiment below in a dark room to find out which material, P, Q, R and S, reflect the most amount of light.



- (a) Tristan's teacher said that his set-up is incorrect. Using the same apparatus as above, draw and label the correct set-up in the box below. [1]



- (b) Name one variable he should keep constant in his experiment. [1]

Score	2
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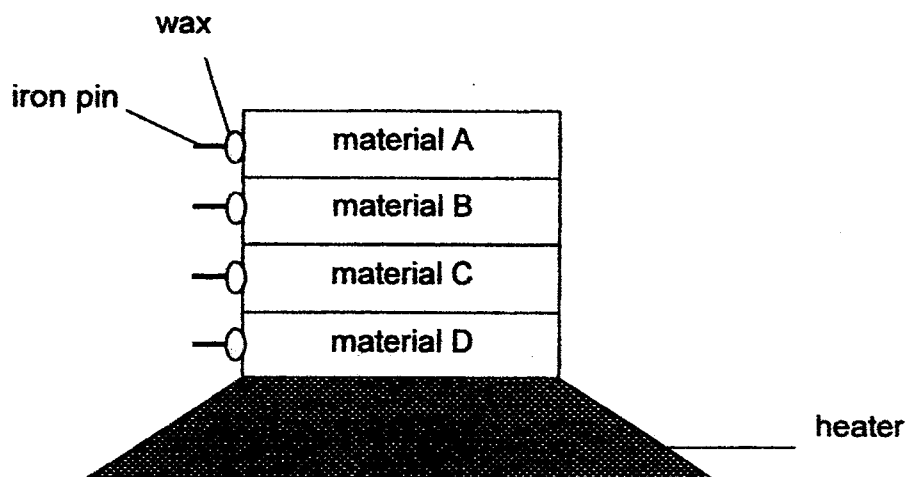
Tristan measured the amount of light reflected from each material and recorded the results of his experiment in the table below.

Material	Amount of light reflected (lux)
P	2250
Q	1670
R	980
S	2750

- (c) From the results in the experiment, which material is the most suitable to be made into a safety vest for traffic police officers who have to work at night? Explain your answer. [1]

Score	1
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43. Ahmad set up the experiment shown below to find out the heat conductivity of four different materials, A, B, C and D.



Ahmad recorded the results of his experiment in the table below.

Material	Time taken for iron pin to drop (min)	Put a cross (X)
A	13	
B	9	
C	15	
D	2	

- (a) Ahmad's sister said that he had recorded ONE of the results wrongly. Put **ONE** cross (X) in the table above to indicate the mistake he had made. [1]

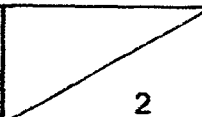
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Score	1
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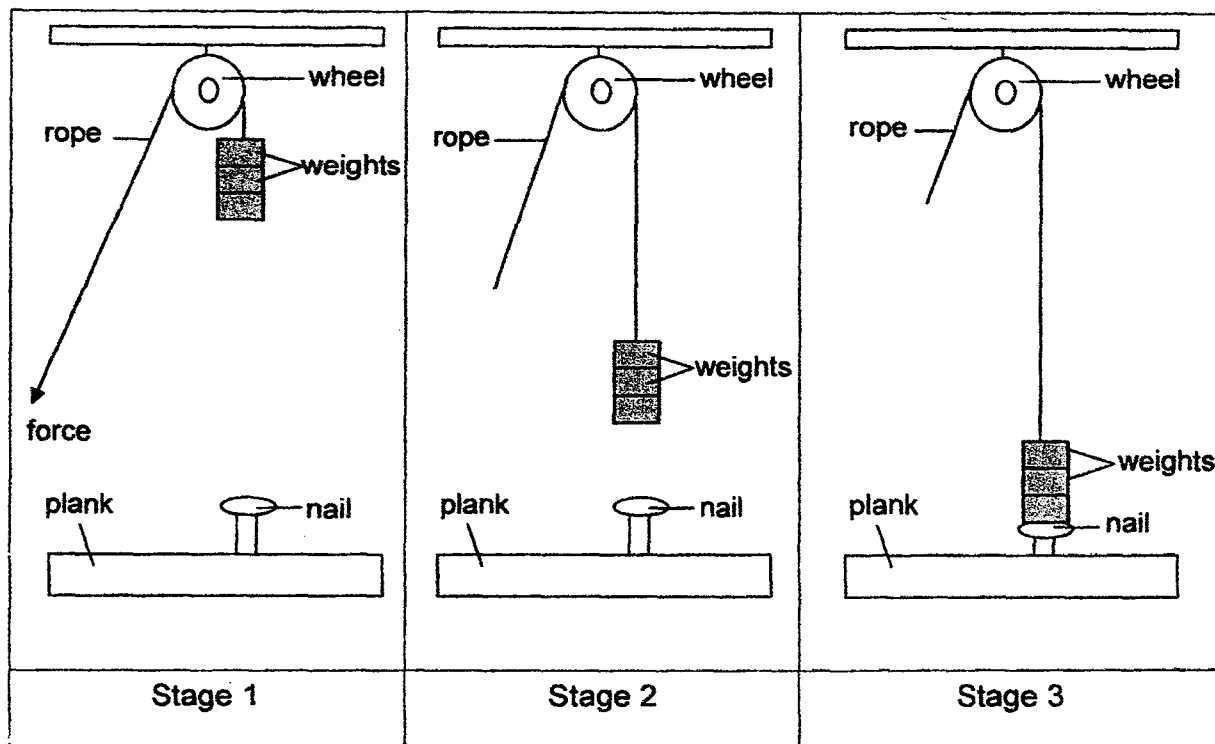
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- (b) Explain your answer in part (a). [1]

- (c) Ahmad's sister also said that he did not conduct a fair test. Suggest what Ahmad can do to the set-up to ensure a fair test. [1]

Score	
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44. Jia Xin designed a simple machine to drive a nail into a plank. She pulled the rope to lift some weights. She then released the rope so that the weights hit the nail into the plank. The diagrams below show the different stages of how the machine works.



- (a) Fill in the blanks below to show the main energy conversion from stage 1 to stage 2. [1]



Score	1
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- (b) Suggest two changes that can be made to Jia Xin's machine to reduce the time taken to drive the nail into the plank. [2]

Suggestion 1	
Suggestion 2	

- End of Paper -

Score	2
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PRELIMINARY EXAM PAPER 2016

SCHOOL : RAFFLES GIRLS' PRIMARY SCHOOL
SUBJECT : SCIENCE
TERM : PRELIMINARY EXAMINATION 2016

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

Q31a. Animal A does not lay eggs while animal D does.

Q31b. C lays eggs and does not have scales.

Q31c. Fish

Q32a. T to P and Q to U

Q32b. The male sex cells from the pollen grain can fertilise with the egg cell in the ovule.

Q32c. S has many small ovules while T has one big ovule.

Q33a. C helps to hold the plant higher for D to receive more sunlight and make more food then transport it around the plant and hence help ith its growth.

Q33b. Water moves only in one direction from the roots to the stems and the leaves in plants, but blood is pumped from the heart to the lungs and back to the heart again before being pumped into other parts of the body. Blood passes around the whole body and all directions.

Q33b. Tom put some cotton wool to prevent the soil from being collected in the beaker.

Q34a. Y controls the activity of the cell and contains generic information.

Q34b. B has an elongated protrusion which increase the exposed surface area of roots to absorb water more efficiently.

Q35a. Habitat A: field, Habitat B: leaf litter

Q35b. The greater the light intensity the higher the temperature for Habitat A.

Q35c. (i) There were more leaves at Y than at X.

(ii) Dead leaves → organism X → organism Z

Q36a. The temperature in A is lower than temperature in B.

Q36b. The tail helps to shade the squirrel from the sun. It is longer and covers most of its body / to help it reduce heat gain from the sun.

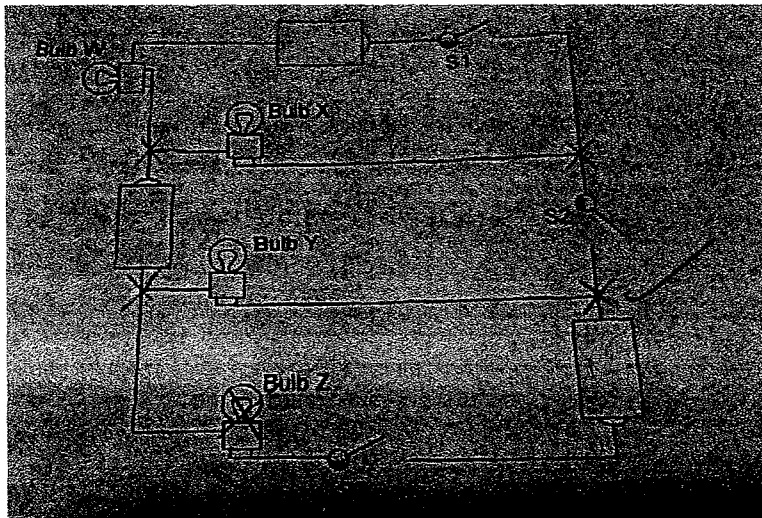
Q37a. 350

Q37b. Air has no definite volume.

Q37c. Decrease, as air has mass when it is removed, the mass of the football will decrease.

Q38a. W, X and Y **Q38b.** Answer: 3

Q38c. Liquid W expanded and formed vapour.



Q38c.

Q39a. Rod Z was a magnet and when Z was brought near the magnet, their like poles were facing each other, causing Z to repel the magnet and hence, moved away.

Q39b. When heated rod Z lost some of its magnetic force and was pulled downwards by gravity. OR When heated rod Z's magnetic force weakened and was overcome by the gravitational force acting on it.

1. The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation

$$f(x) = \int_0^x \frac{1}{1+t^2} dt, \quad x \in \mathbb{R}.$$

It is shown that the function $f(x)$ is strictly increasing and concave down on the interval $(-\infty, \infty)$. Moreover, the function $f(x)$ is bounded on the interval $(-\infty, \infty)$.

2. The second part of the paper is devoted to the study of the function $g(x)$ defined by the equation

$$g(x) = \int_0^x \frac{1}{1+t^2} dt, \quad x \in \mathbb{R}.$$

It is shown that the function $g(x)$ is strictly increasing and concave down on the interval $(-\infty, \infty)$.

Moreover, the function $g(x)$ is bounded on the interval $(-\infty, \infty)$.

3. The third part of the paper is devoted to the study of the function $h(x)$ defined by the equation

$$h(x) = \int_0^x \frac{1}{1+t^2} dt, \quad x \in \mathbb{R}.$$

It is shown that the function $h(x)$ is strictly increasing and concave down on the interval $(-\infty, \infty)$.

Moreover, the function $h(x)$ is bounded on the interval $(-\infty, \infty)$.

4. The fourth part of the paper is devoted to the study of the function $k(x)$ defined by the equation

Q40a. Walking up the stairs goes against the pull of gravity.

Q40b. The mats are rough and increases friction between the ground and the feet, so as to prevent slipping.

Q41a. The larger the surface area of parachute, the longer the time taken to complete the 5 meter run.

Q41b. Less than with the holes. There would be lesser amount of surface area in contact with the air, causing lesser friction and allowing Peter to run faster.

Q42a. Draw on your own.

Q42b. The size of the material.

Q42c. Material S. It reflected the most amount of light so it would allow the police officer to be seen the most clearly at night.

Q43a. Answer: Material C, Put a cross X in the box.

Q43b. C was closer to the heat source than A and B, so it should take a shorter time for the pin to drop, not longer.

Q43c. He should let all the materials to have an equal amount of area in contact with the heater.

Q44a. Gravitational Potential —————> kinetic

Q44b. Suggestion 1 – Apply oil onto the wheel and nail.

Suggestion 2 – Add more weights.

Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains.

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26