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**PEI CHUN PUBLIC SCHOOL**  
**PRELIMINARY EXAMINATION 2018**

**SCIENCE**  
**SECTION A**

**Time: 1 h 45 min**

Name : \_\_\_\_\_ (    )

Class : Primary 6 / (    ) \_\_\_\_\_

Date : 3 August 2018

Parent's Signature: \_\_\_\_\_

**INSTRUCTIONS TO CANDIDATES**

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

FOLLOW ALL INSTRUCTIONS CAREFULLY.

ANSWER ALL QUESTIONS.

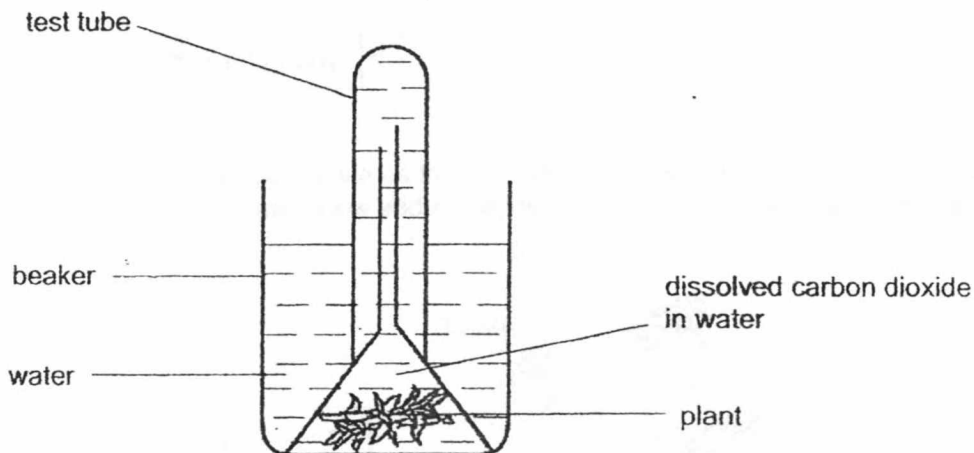
SHADE YOUR ANSWERS ON THE OPTICAL ANSWER SHEET (OAS) PROVIDED.



**Section A (28 × 2 marks)**

For questions 1 to 28, choose the most suitable answer and shade its number (1, 2, 3 or 4) on the Optical Answer Sheet (OAS) provided.

1. Leslie saw an animal for the first time. He concluded that it is a bird. Which of the following characteristics helped him conclude that the animal is a bird?
- (1) It can fly.
  - (2) It has a beak.
  - (3) It stands on two legs.
  - (4) It is covered in feathers.
2. Derek set up an experiment to find out if the amount of dissolved carbon dioxide in water affects the rate of photosynthesis. He prepared four set-ups A, B, C and D. Different amounts of baking soda are added to the set-ups to increase the amount of dissolved carbon dioxide in the water. The diagram below shows one of the set-ups.

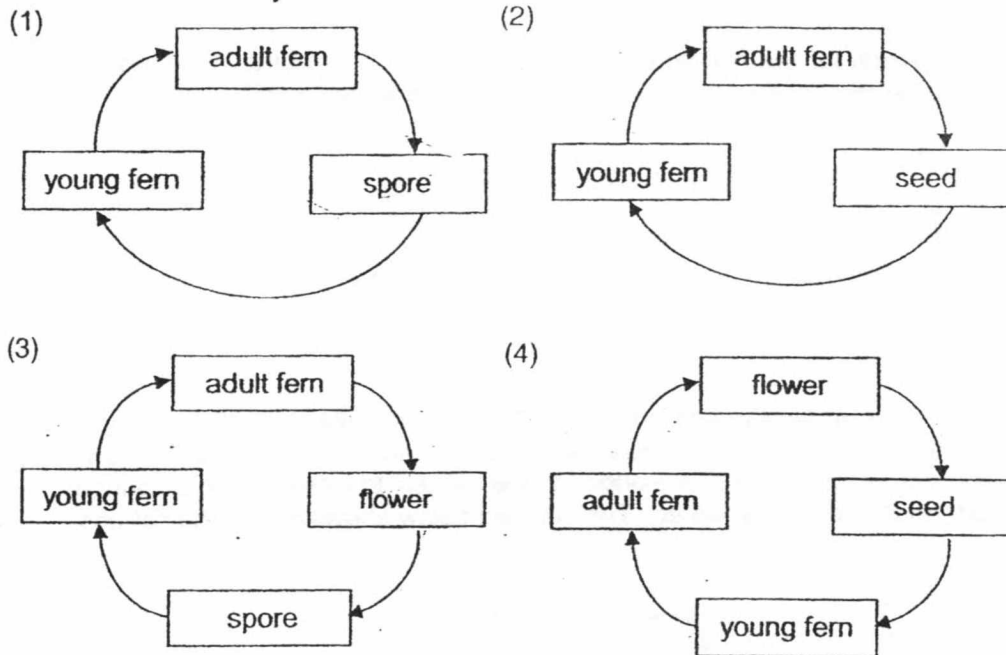


Which two set-ups should he use for his experiment?

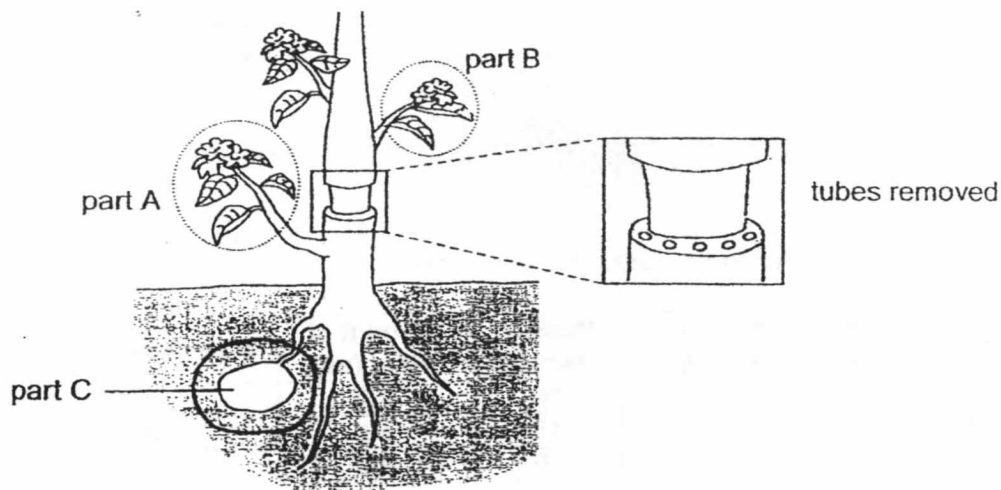
Set-up	Amount of baking soda added (g)	Mass of plant (g)	Amount of water (ml)	Size of beaker (ml)
A	20	10	100	100
B	20	15	50	100
C	10	20	100	200
D	10	15	50	200

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

3. Which of the following best describes the stages of development in the life cycle of a ladder fern?



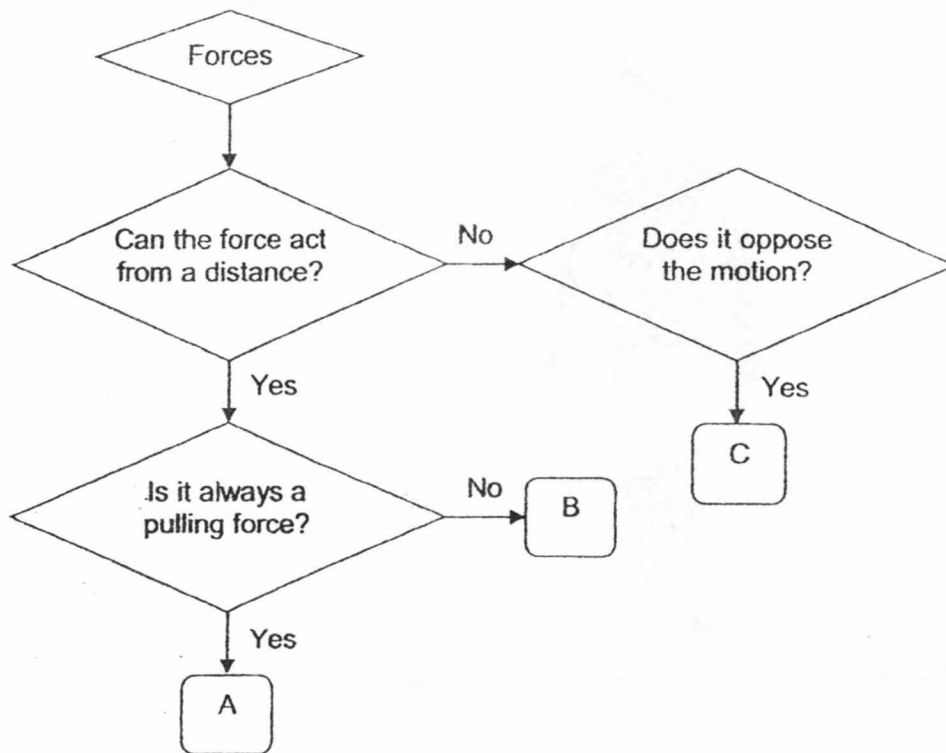
4. The outer ring of a stem was removed from a plant as shown below. Both the water-carrying tubes and food-carrying tubes were removed.



It was observed that part C grew bigger after a week.  
Which of the following statements best explains the observation?

- (1) Food made in A is stored in C.
- (2) Food made in B is stored in C.
- (3) Food is absorbed by C from the soil.
- (4) Food made in A and B is stored in C.

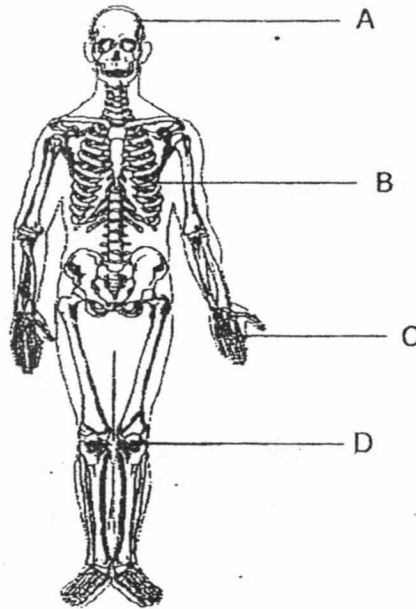
5. Look at the flow chart below.



Which of the following correctly identify the types of forces?

	A	B	C
(1)	magnetic	gravitational	frictional
(2)	magnetic	elastic spring	frictional
(3)	gravitational	elastic spring	magnetic
(4)	gravitational	magnetic	frictional

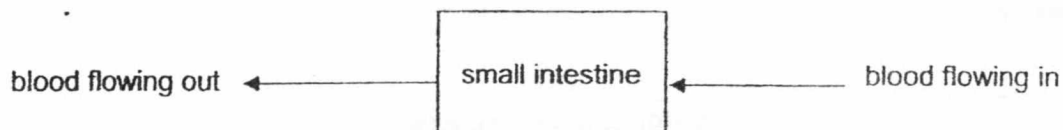
6. The diagram below shows the human skeletal system with some parts labelled A, B, C and D.



Which of the following parts help(s) to protect our organs?

- (1) A only
  - (2) A and B only
  - (3) B and D only
  - (4) A, B, C and D
7. At which parts of the human digestive system are digestive juices **not** added to the food?
- (1) mouth, gullet
  - (2) gullet, large intestine
  - (3) gullet, stomach, small intestine
  - (4) mouth, stomach, small intestine

8. The diagram shows blood flow in a part of the human digestive system about six hours after a meal.

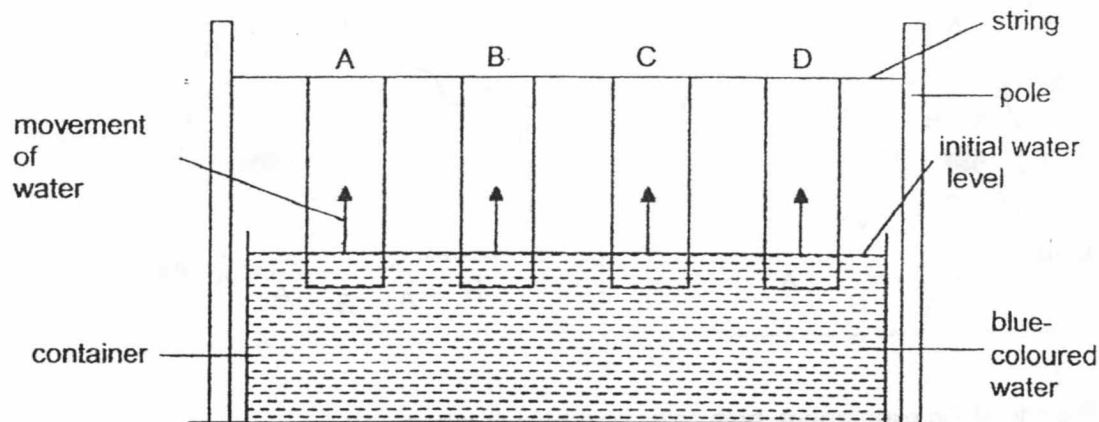


The amount of oxygen, carbon dioxide and digested food in the blood flowing out was compared with that of the blood flowing in.

Which of the following shows the correct comparison?

	Blood flowing out has		
(1)	more oxygen	less carbon dioxide	more digested food
(2)	more oxygen	more carbon dioxide	less digested food
(3)	less oxygen	more carbon dioxide	more digested food
(4)	less oxygen	less carbon dioxide	less digested food

9. Jacob wanted to find out which material, A, B, C or D, is the most suitable material for a towel. He conducted an experiment as shown below.



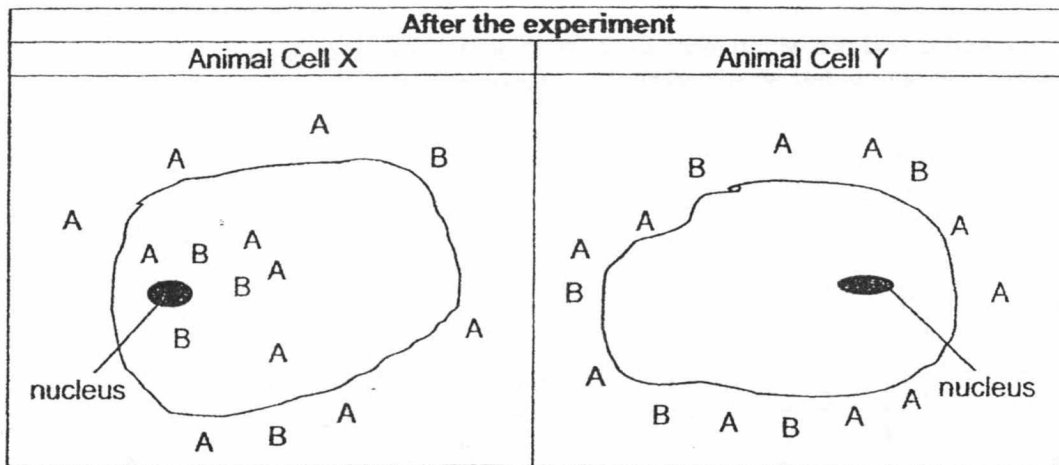
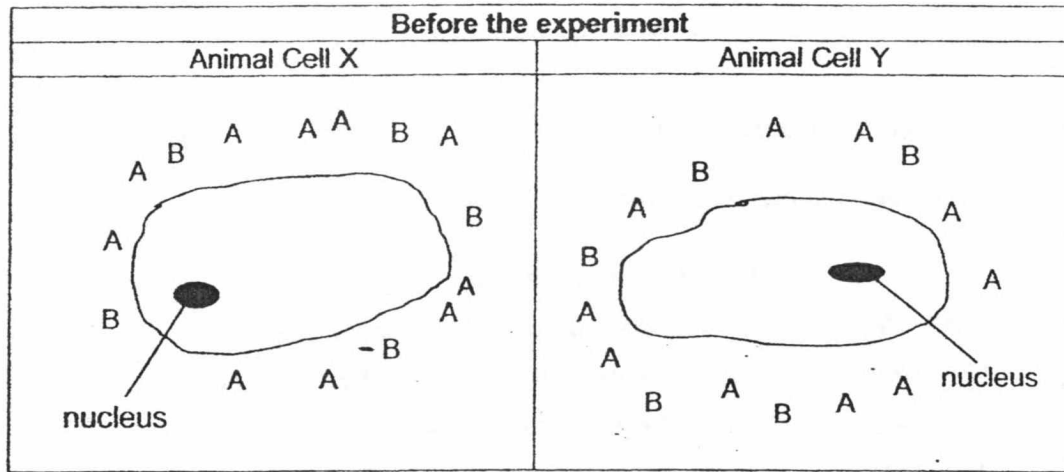
After 5 minutes, Jacob measured X, the distance travelled by the water up each material.

Material	Distance X (cm)
A	9
B	12
C	6
D	4

Which material is the most suitable for making a towel?

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

10. Kala placed two animal cells X and Y in two beakers of water with the same amount of dissolved substances, A and B, respectively. An animal cell can expand when water is taken in.

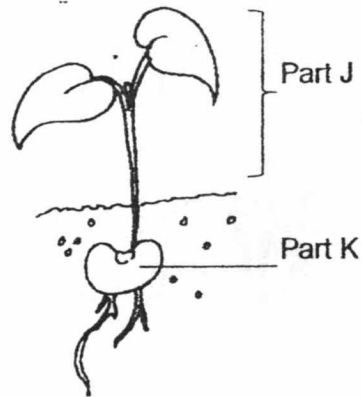


At the end of the experiment, both cells were bigger. Which of the conclusions made by Kala is correct?

- (1) Cytoplasm of cell X only allowed water to enter.
- (2) Cell membrane of cell Y allowed water to enter.
- (3) Nucleus of cell X controlled the movement of A and B.
- (4) Cell wall of cell Y prevented A and B from entering.



11. The diagram below shows a young plant. The young plant is watered daily.



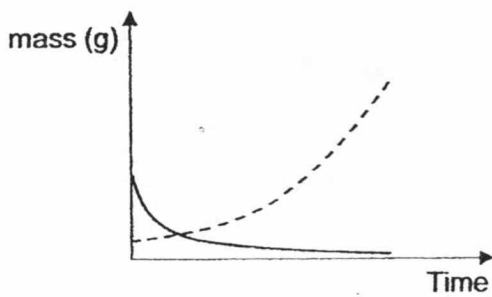
Which one of the following graphs correctly shows the mass of parts J and K over a period of one week?

**Key**

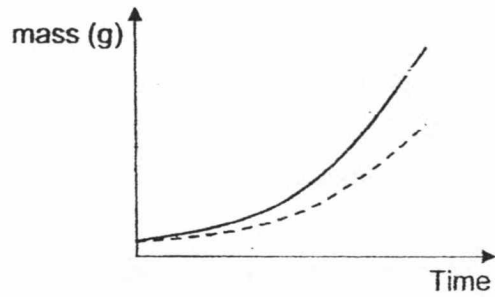
Part J ———

Part K - - - - -

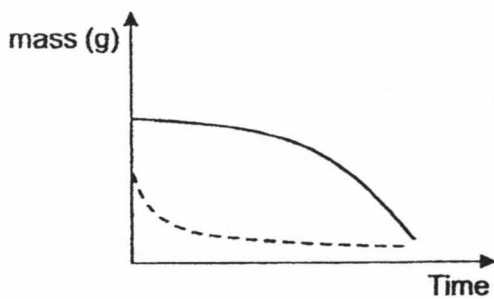
(1)



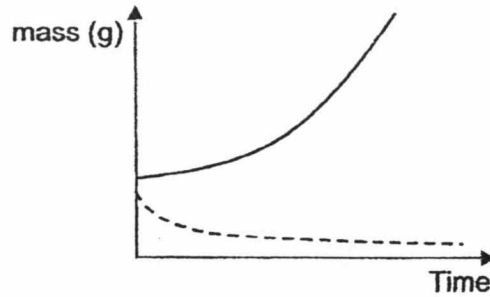
(2)



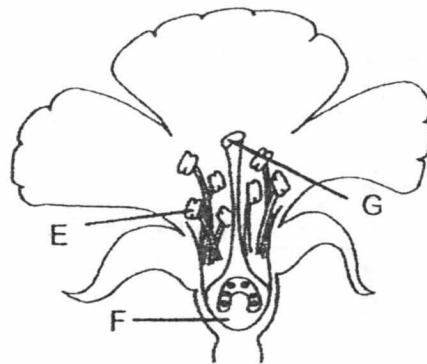
(3)



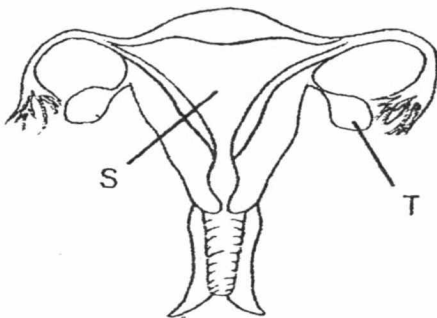
(4)



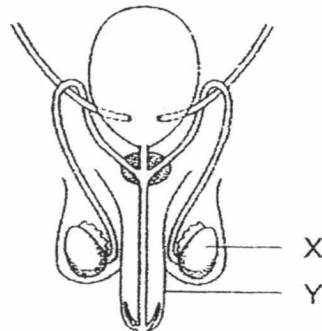
12. The diagrams show the reproductive systems of a flowering plant and human.



flower reproductive system



human female reproductive system

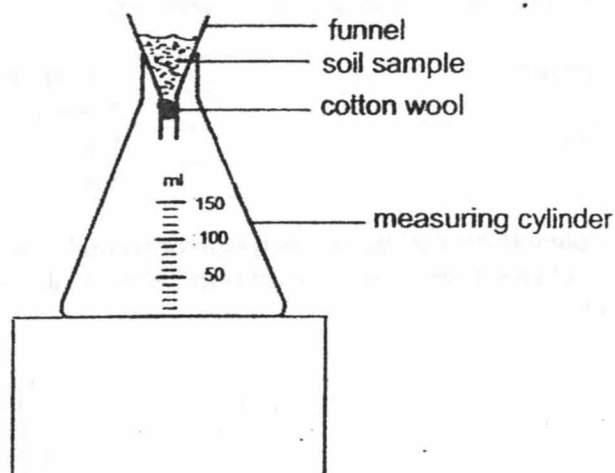


human male reproductive system

Which of the following parts have the same function?

- (1) E and X
- (2) E and Y
- (3) F and S
- (4) G and T

13. Darren collected soil samples A, B, C and D. He prepared the set-up as shown below and poured 80 ml of water onto sample A during the experiment. He repeated the experiment using soil samples B, C and D.



Darren measured the amount of water collected in the measuring cylinder after 2 minutes and recorded the results for all four samples.

Sample	Amount of water collected (ml)
A	70
B	20
C	50
D	75

In a rice plantation, a flooded paddy field is needed for the seedlings to grow.

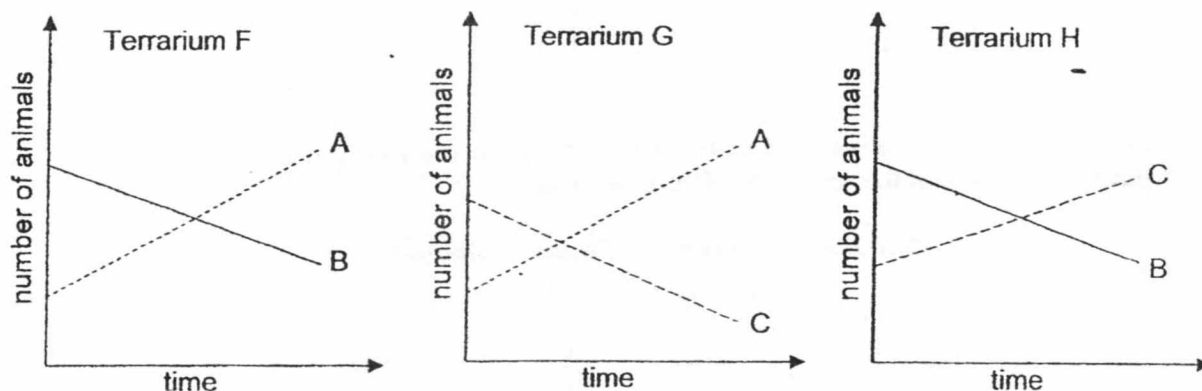
Based on the above results, which type of soil sample; A, B, C or D, is the most suitable for use in the paddy field?

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

14. Anita decided to study the food relationship among three types of animals, A, B and C. She placed the animals in three similar terrariums, F, G and H, that are similar to their natural habitat. She then placed a number of the animals in the terrariums in the following arrangement. No additional animals were added in each terrarium.

Terrarium	Animals
F	A and B only
G	A and C only
H	B and C only

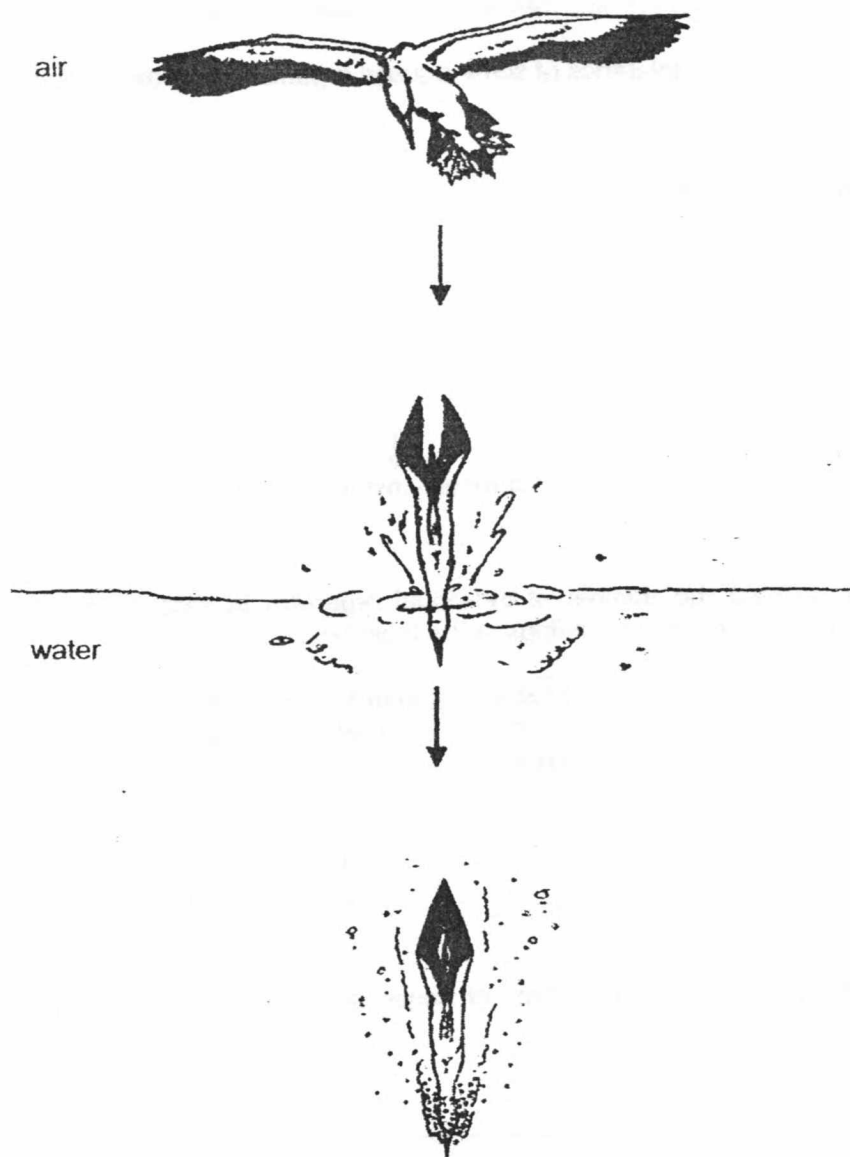
For a month, Anita counted the number of each type of animal in the terrariums every two days. She plotted three graphs, as shown below, to illustrate the results that she had recorded.



Based on the graphs, which of the following statements correctly explains a possible food relationship between the animals?

- (1) A is the prey of C.
- (2) B is the predator of A.
- (3) C is the predator of B.
- (4) B is both a predator and a prey

15. The diagram shows a bird diving into water quickly to catch its prey more easily in the water.



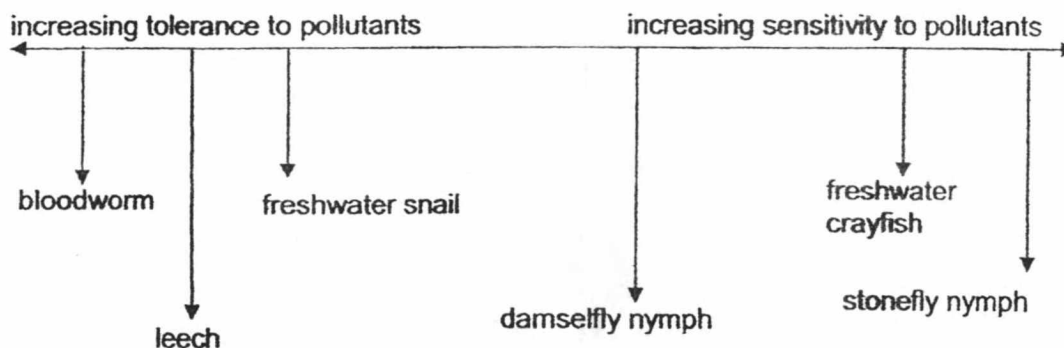
Which of the following features would enable the bird to catch its prey more easily in the water through its diving?

- A : webbed feet
- B : hollow bones
- C : streamlined body
- D : well-developed wings

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

16. Different aquatic animals are able to tolerate different levels of pollutants. As the level of pollutants increases, the number of animals sensitive to the pollutants will decrease and the number of animals tolerant to the pollutants will increase.

The chart below shows the tolerance of some aquatic organisms to water pollutants.



An investigator counted the number of individual organism in samples from four different streams and recorded his findings in the table below.


Stream	Bloodworm	Leech	Fresh-water snail	Damselfly nymph	Fresh-water crayfish	Stonefly nymph
A	4	5	4	5	5	3
B	2	2	4	4	6	5
C	6	4	4	3	2	0
D	7	5	4	6	0	0


Which of the following shows the streams arranged from the most polluted to the least polluted?

	<div style="display: flex; justify-content: space-between; align-items: center;"> <span>← most polluted</span> <span>least polluted →</span> </div>			
(1)	A	B	C	D
(2)	B	C	D	A
(3)	C	D	B	A
(4)	D	C	A	B

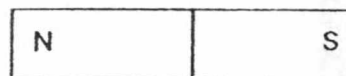
17. Lionel had three rods, A, B and C, of equal length and thickness. The ends of each rod were labelled X and Y. He brought a bar magnet near to the rods and recorded his observations in the table below.

A 

B 

C 

bar magnet

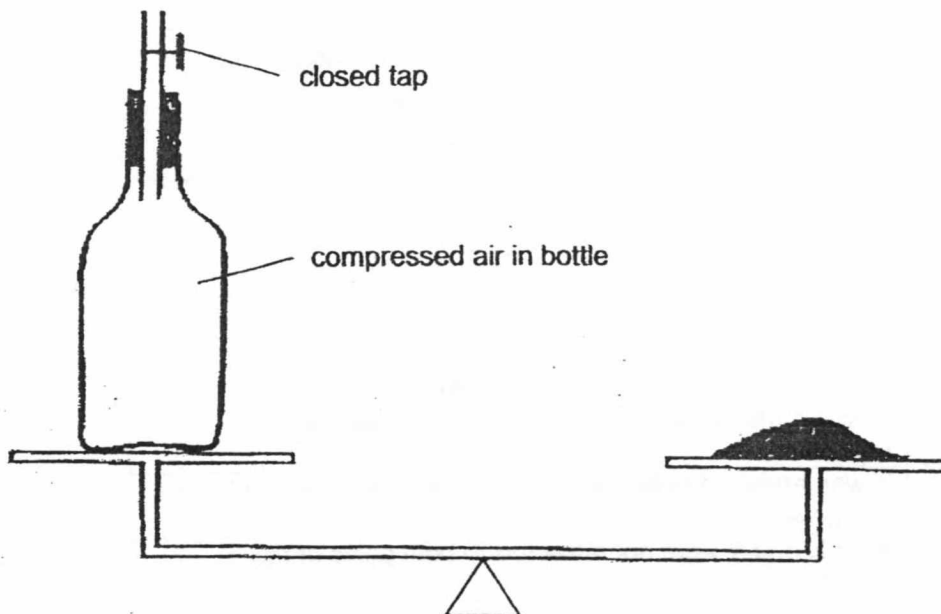


Rod	Observations
A	X was attracted to the south pole of the magnet but Y repelled it.
B	X was attracted to the two poles; Y was also attracted to the two poles.
C	Both X and Y were not attracted to both poles of the magnet.

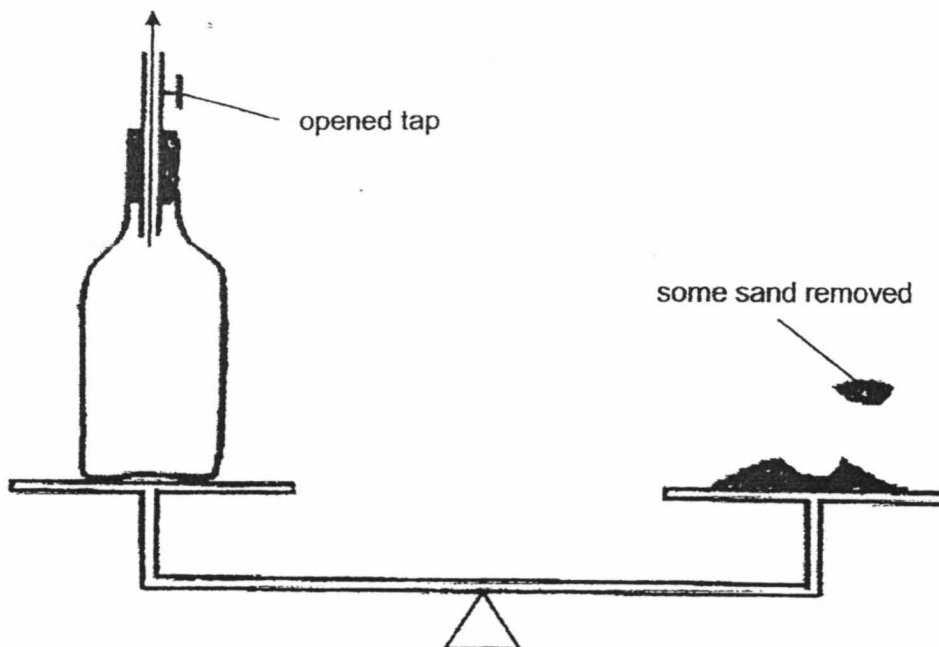
Which of the following statements best describes the rods?

- (1) Rod B is a magnet
- (2) Rod C is not made of metal.
- (3) Both rods A and B are magnets.
- (4) Rods A and B are made of magnetic materials.

18. Jay balanced a bottle containing compressed air with some sand as shown below. The closed tap stopped air in the bottle from escaping.



He then opened the tap, allowing some of the air in the bottle to escape through the mouth of the bottle. He removed some sand to keep the bottle balanced with the remaining sand.

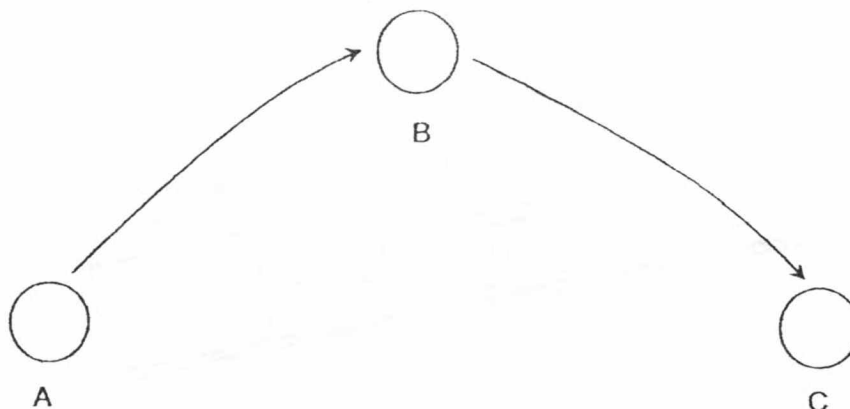


Which of the following can be concluded from the sand that was removed?

- (1) Air has mass.
- (2) Air occupies space.
- (3) Air can be compressed.
- (4) Air takes the shape of its container.



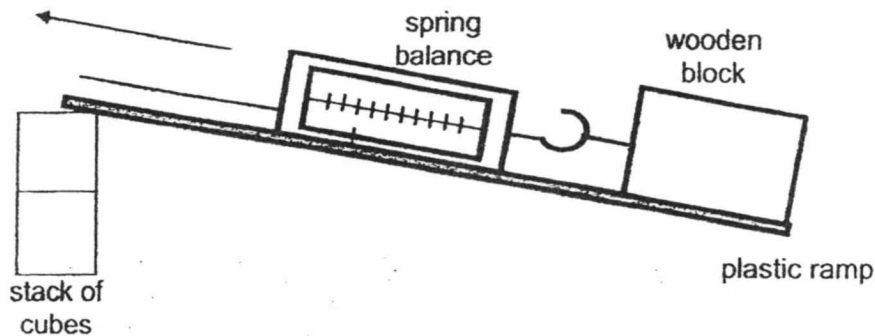
19. When a ball was thrown into the air from point A, it reached a maximum height above the ground, B, before falling to the ground at point C.



Which of the following statements correctly describes what was happening to the moving ball?

- (1) Gravity was acting on the ball at all times.
- (2) There was no force acting on the ball when it reached B.
- (3) Gravity began acting on the moving ball **only after** it reached B so it started falling to the ground.
- (4) The speed of the moving ball increased as it travelled from point A to B and decreased as it travelled from point B to C.

20. Marcus wanted to find out if the length of a ramp affects the amount of force required to move a wooden block up the ramp. He set up the experiment as shown in the diagram below. The amount of force required to move the block is shown on the spring balance.



Which of the following should he keep the same to ensure that the experiment is fair?

- A : material of the ramp
- B : number of cubes in the stack
- C : length of the ramp
- D : surface area of the wooden block in contact with the ramp

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

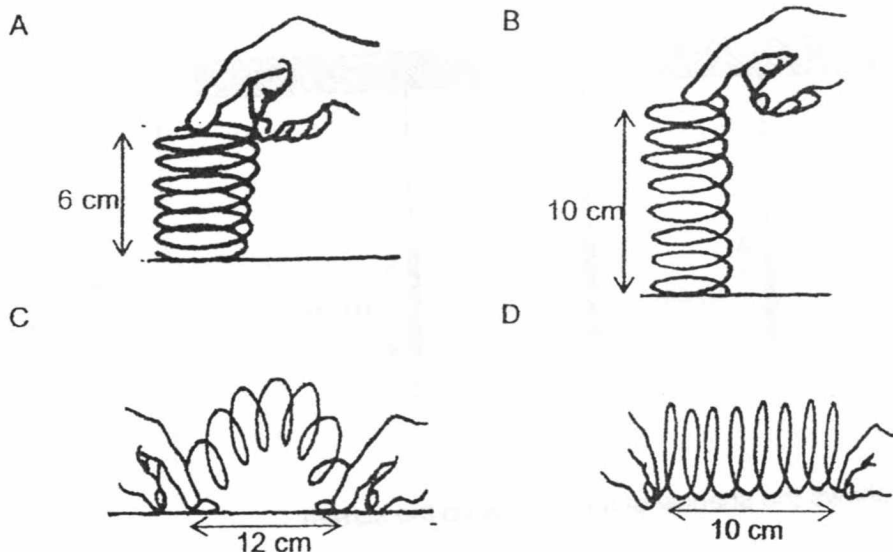
21. The table below shows the melting points and the boiling points of substances J and K.

Substance	Boiling point (°C)	Melting point (°C)
J	330	11
K	165	43

Which of the following shows the correct state(s) of J and K at 20 °C?

	J	K
(1)	gas	solid
(2)	liquid	liquid
(3)	liquid	solid
(4)	gas	liquid

22. Roy applied forces to a 10 cm spring in different ways as shown in the diagrams below.



In which of the above diagrams do the spring possess elastic potential energy?

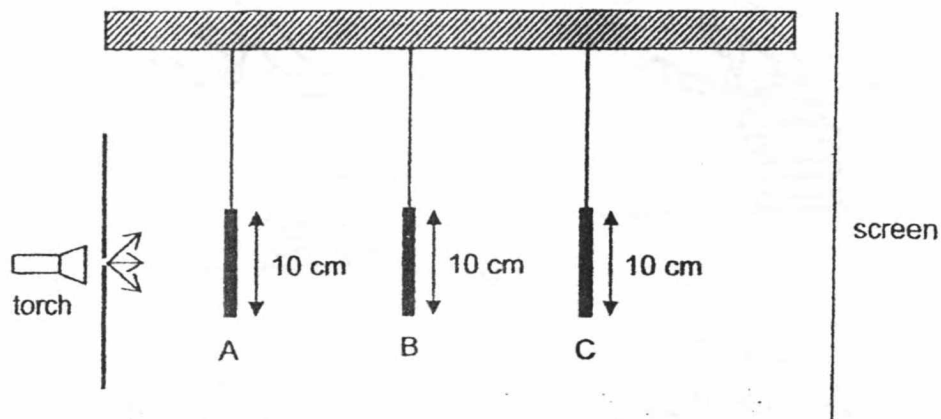
- (1) A and C only  
(2) A and D only  
(3) C and D only  
(4) A, B, C and D
23. Kim carried out an experiment by placing four bottles, A, B, C and D, made of different materials in a room. Each bottle was filled with cold water at 5 °C. After fifteen minutes, the temperature of the water in each bottle was taken and recorded as shown in the table.

Bottle	Temperature recorded (°C)
A	20
B	9
C	26
D	17

Kim wanted to choose a bottle that could keep hot drinks hot for as long as possible. Which is the most suitable bottle for Kim?

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

24. The set-up below shows light shining on three wooden objects A, B and C. They are placed at different distances from the torch.



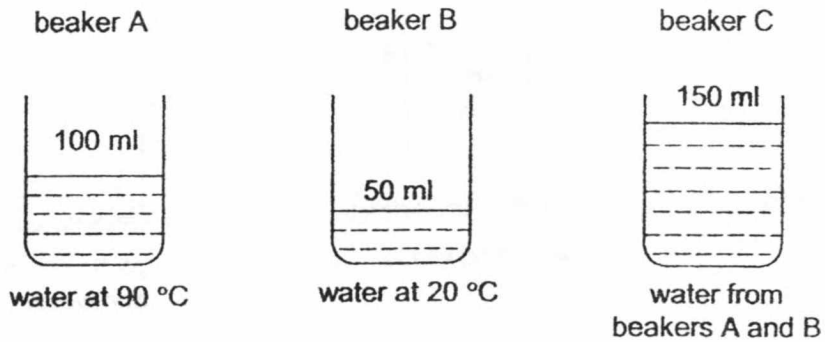
The diagram below shows the shadow of the objects on the screen.



What are objects A, B and C?

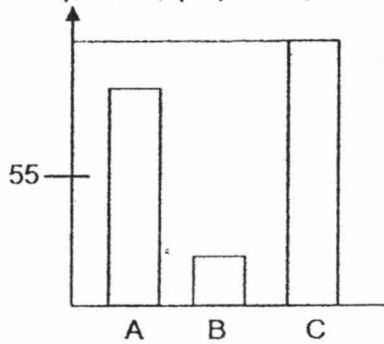
	A	B	C
(1)			
(2)			
(3)			
(4)			

25. Lina used a thermometer to measure the temperatures of the water in beakers A and B. She then poured all the water from both beakers into beaker C and measured the temperature of the mixture.

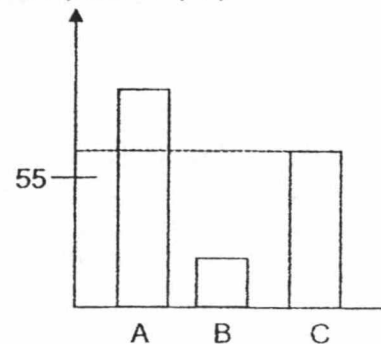


Which of the following graphs correctly shows the temperatures of the water in beakers A, B and C?

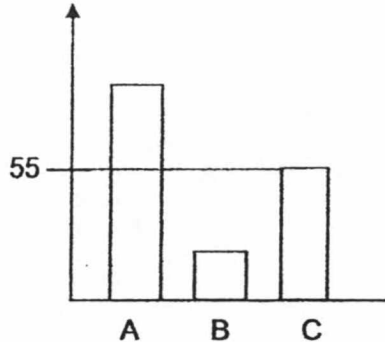
(1) temperature (°C)



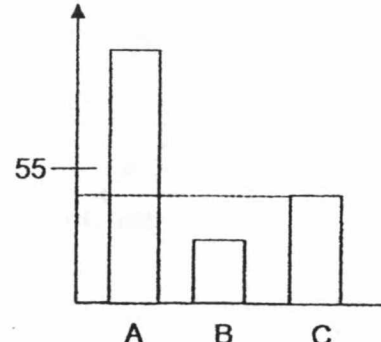
(2) temperature (°C)



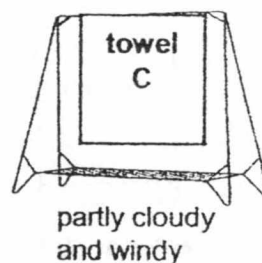
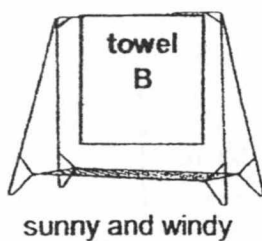
(3) temperature (°C)



(4) temperature (°C)

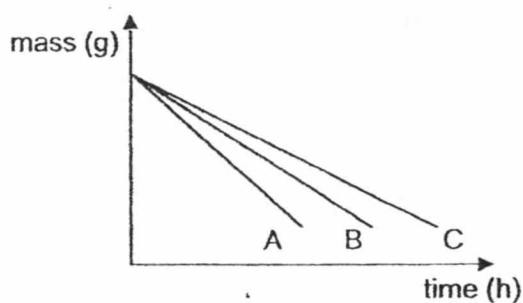


26. Harry wanted to find out if different weather conditions can affect the rate of evaporation of water. He soaked three wet identical towels, A, B and C, in the same volume of water before hanging them out to dry at different locations as shown below.

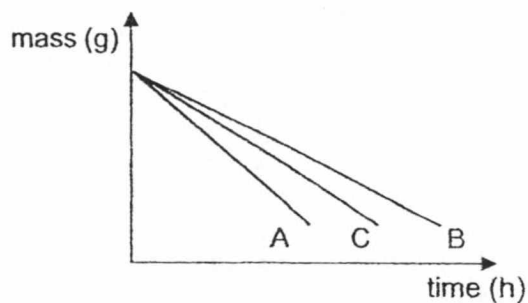


Which one of the following graphs shows the change in the mass of the towels over time?

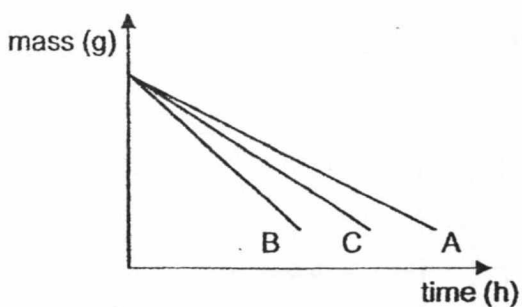
(1)



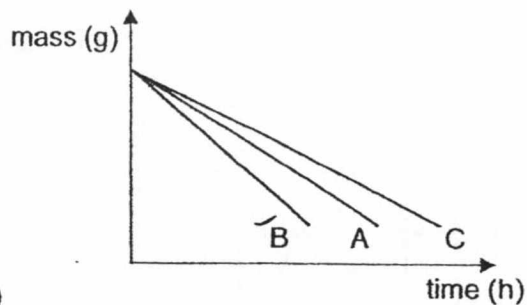
(2)



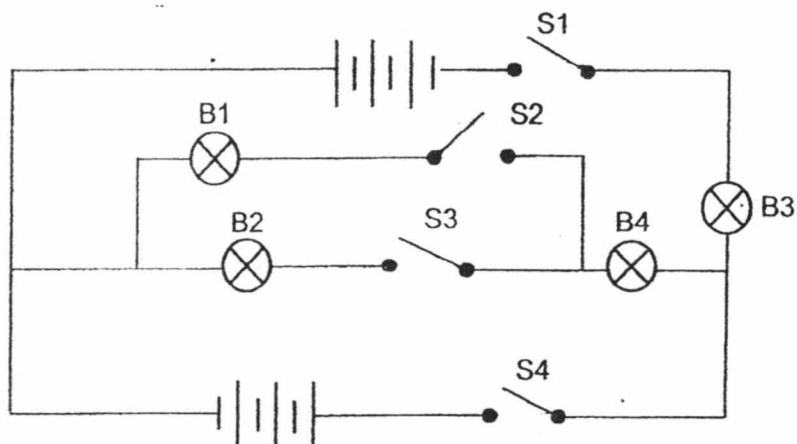
(3)



(4)



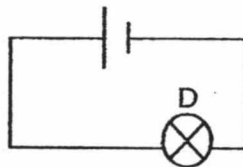
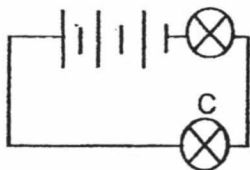
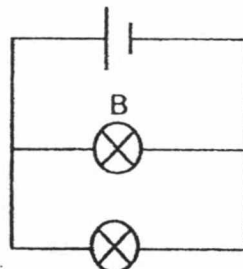
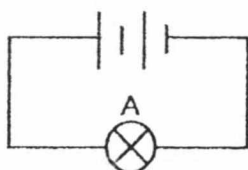
27. Study the circuit shown below.



Which of the following is correct?

	Switches closed	Bulbs that would light up
(1)	S1 and S4	B3 and B4
(2)	S2 and S3	B1 and B2
(3)	S1, S2 and S3	B1, B2, B3 and B4
(4)	S2, S3 and S4	B2, B3 and B4

28. In the four circuits, all the bulbs and batteries are new and identical.



Which two bulbs have the same brightness?

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





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**PEI CHUN PUBLIC SCHOOL**  
**PRELIMINARY EXAMINATION 2018**

**SCIENCE**  
**SECTION B**

**Time: 1 h 45 min**

Name : \_\_\_\_\_ (     )

Class : Primary 6 / (     )

Date : 3 August 2018

Parent's Signature: \_\_\_\_\_

SECTION A	56
SECTION B	44
TOTAL	100

**INSTRUCTIONS TO CANDIDATES**

**DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.**

**FOLLOW ALL INSTRUCTIONS CAREFULLY.**

**ANSWER ALL QUESTIONS.**

**WRITE YOUR ANSWERS IN THIS BOOKLET.**

1

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5

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7

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9

10

11

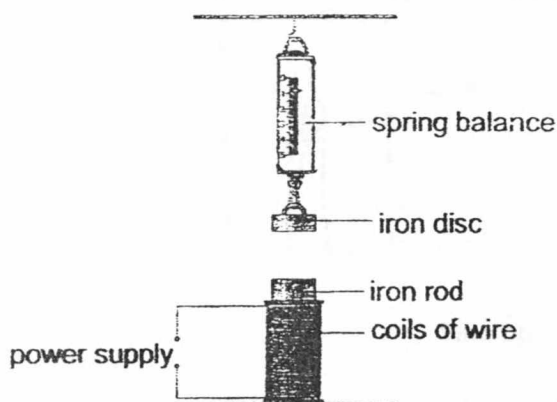
12

13

**Section B (44 marks)**

For questions 29 to 40, write your answers in the spaces provided.

29. Amelia set up an experiment as shown below. The spring balance showed a reading of 1 unit when the iron disc was hung on it and the power supply was switched off.



- a) The reading on the spring balance increased when the power supply was switched on. Give a reason for this observation. [ 1 ]

- b) Amelia repeated the experiment by changing the material the rod was made of and the number of coils around the rod. She recorded the readings in the table below.

Material the rod is made of	Number of coils of wire around the rod	Reading on spring balance
A	100	5
B	75	3
C	50	5
D	100	4

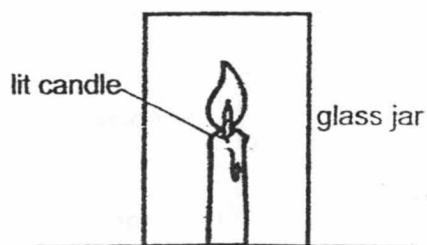
Based on the results, can you conclude which rod created the weakest electromagnet? Explain your answer. [ 2 ]

- c) The experiment was repeated with materials P and Q. The power supply was then switched off. The table below shows the readings for materials P and Q after the power supply was switched off.

Material the rod is made of	Number of coils of wire around the rod	Reading on spring balance after power supply was switched off
P	100	1
Q	100	3

Which material, P or Q, is more suitable to be used in an electromagnet? Give a reason for your answer. [ 1 ]

30. Angie conducted an experiment to test if oxygen is needed for burning to take place. She placed a 100 cm<sup>3</sup> glass jar over a lit candle as shown in the diagram below. The candle flame went out after three seconds.



- a) Why did the candle flame go out?

[ 1 ]

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- b) Angie then used jars of different sizes and placed them over the lit candle. She measured the amount of time taken for the candle flame to go out each time and recorded her results in the table below.

Size of glass jar (cm <sup>3</sup> )	Time taken for flame to go out (seconds)
200	5
500	14
1000	28

What conclusion can you make from her results?

[ 1 ]

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- c) Suggest how Angie can make her results more reliable.

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31. At the beginning, an island had high populations of plant M and animal P. Plant M had seeds covered with hooks. Animal P was covered with fur.

When animal P moved around, it carried the seeds of plant M that clung on its fur.

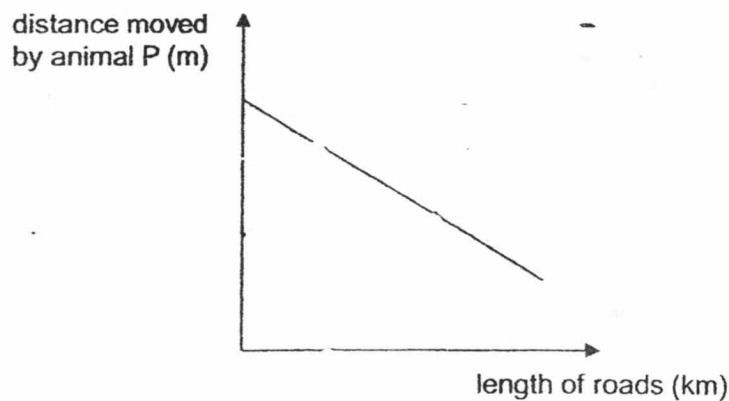
- a) State one benefit for plant M when its seeds get dispersed by animal P. [ 1 ]

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Roads began to be built on the island.

A scientist found out how the length of roads built affected the distance moved by animal P. His results are shown in the graph below.



Over the next few years, the scientist observed that the number of young plant M decreased when the length of roads built increased.

- b) Using the information provided, explain this observation. [ 2 ]

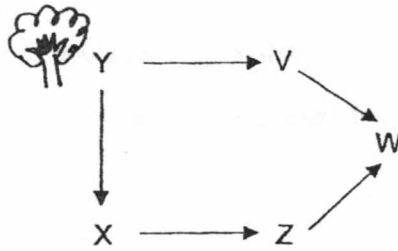
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SCORE	
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32. The diagram below shows a food web in a certain community. Y is a tree.



- a) State two benefits that tree Y can provide for animal X.

[ 1 ]

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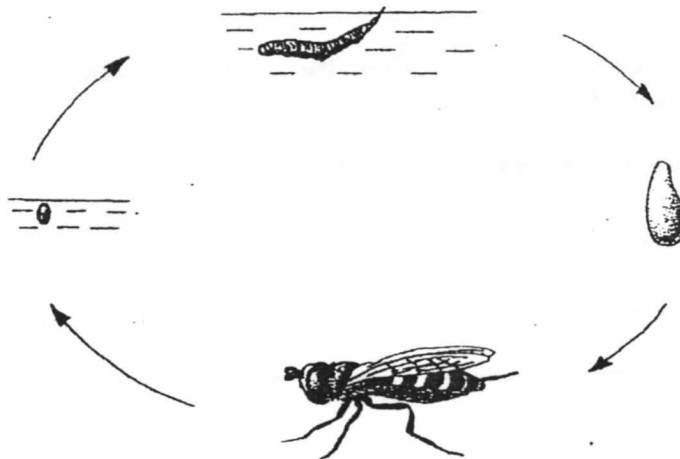
- b) A disease wiped out the whole population of animal Z. Explain how this would affect the population of animal V.

[ 2 ]

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33. The diagram below shows the life cycle of insect X.



- a) The young of insect X lives in water and feeds on decaying matter while the adult of insect X lives on land and feeds on nectar.

Suggest one advantage for the young and the adult to live in different surroundings.

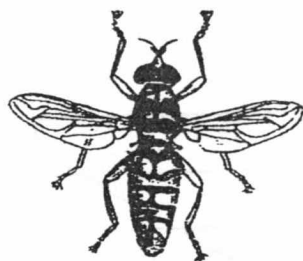
[ 1 ]

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- b) Insect X looks like insect Y. Both live in the garden habitat. Insect X does not sting. However, predators remember that insect Y stings.



Insect X



Insect Y

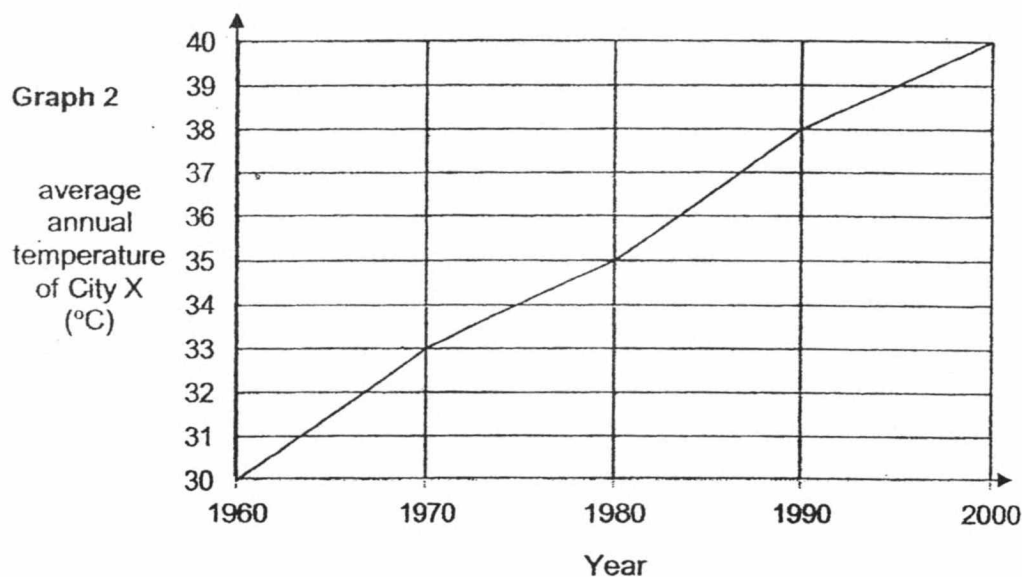
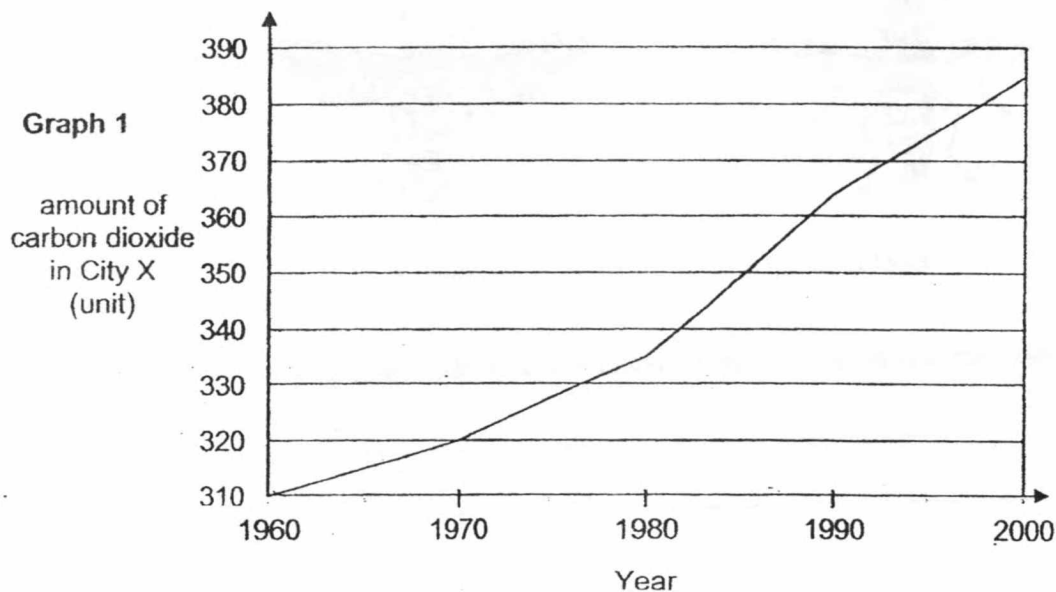
Give a reason why it is an advantage for insect X to look like insect Y.

[ 1 ]

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34. Study the two graphs below. Graph 1 shows the amount of carbon dioxide measured in City X from 1960 to 2000. Graph 2 shows the average annual temperature readings in City X over the same time period.



- a) Based on graph 1, describe how the amount of carbon dioxide in City X changed. [ 1 ]

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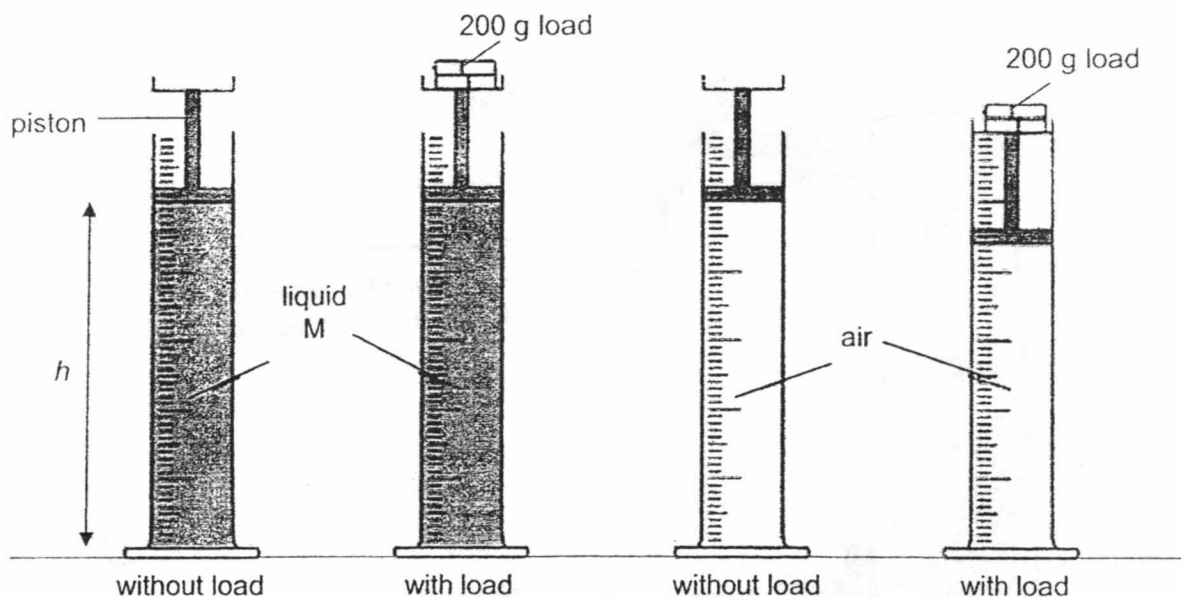
- b) Based on the given data, explain how the increase in the amount of carbon dioxide in the atmosphere leads to global warming. [ 1 ]

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35. Jake set up an experiment as shown below. He measured the height,  $h$ , of liquid M and air in the cylinders before and after a 200 g load was added to the piston.



The results of his experiment are shown in the table below.

	Height, $h$ (cm)	
	cylinder containing M	cylinder containing air
After 200 g load was added to the piston	remained the same	decreased

- a) Based on the results of Jake's experiment, what can he conclude about the property of liquid M and air? [ 2 ]

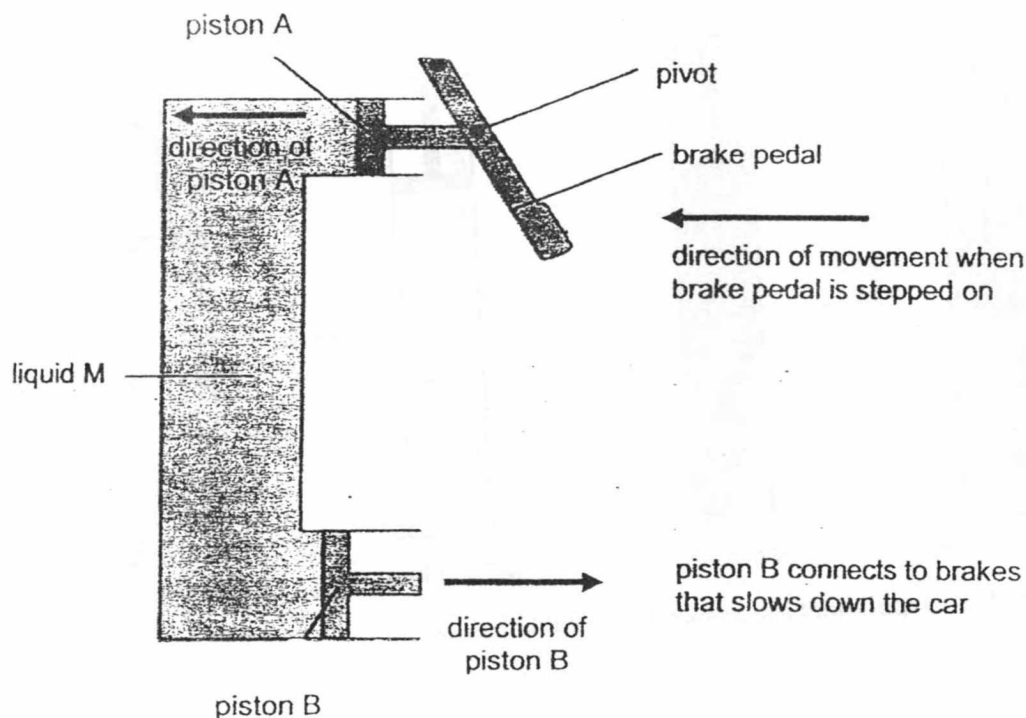
Liquid M : \_\_\_\_\_

\_\_\_\_\_

Air : \_\_\_\_\_

\_\_\_\_\_

The diagram below shows a brake system in a car. When the brake pedal is stepped on, the car slows down. The brake system has a container filled with liquid M. When the brake pedal is stepped on, pistons A and B move in the directions as shown in the diagram below.



- b) State two properties of liquid M that allow the brake system to work. [ 2 ]

Property 1 : \_\_\_\_\_

\_\_\_\_\_

Property 2 : \_\_\_\_\_

\_\_\_\_\_

- c) If there are air bubbles trapped in liquid M, the brake will not work properly. Give a reason for this. [ 1 ]

\_\_\_\_\_

\_\_\_\_\_

36. Gabriel ensured that his goggles were tight and no water from the pool could enter his goggles before he started swimming. After swimming for a while, the inner lenses of his goggles were covered with white mist and he had difficulty seeing clearly in water.



- a) What state of matter is the white mist in? [ 1 ]

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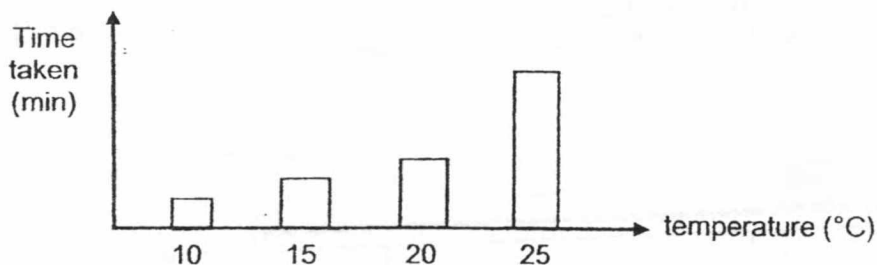
- b) Explain why his goggles were covered with white mist after swimming for a while. [ 2 ]

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Gabriel then carried out an experiment to find out if the temperature of the water in the pool affects the time taken for his goggles to become misty. The graph below shows his results.



- c) What is the relationship between the temperature of the water in the pool and the time taken for the goggles to become misty? [ 1 ]

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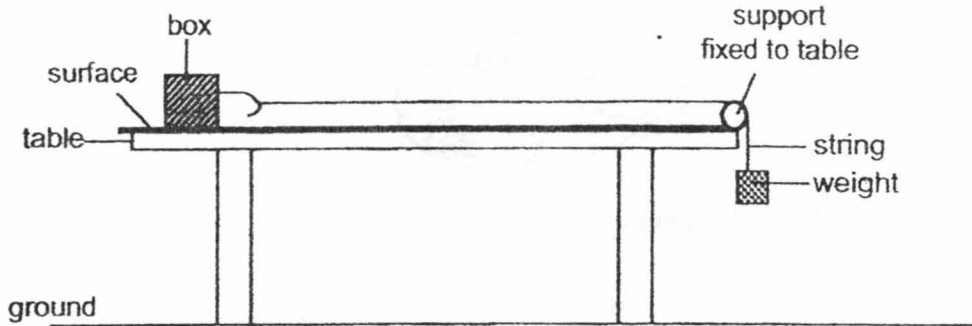
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- d) Explain why it is less likely for goggles to become misty when swimming in a heated pool. [ 1 ]

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37. Edison used the set-up below to investigate the number of iron weights needed to move the box across three different surfaces, A, B and C.



He recorded his results in the table below.

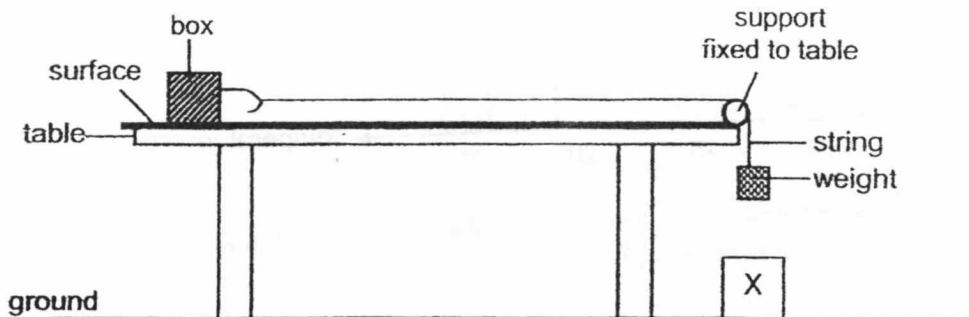
Surface	Number of iron weights
A	8
B	5
C	3

- a) Based on the experimental results, which surface, A, B or C, showed the most amount of friction between it and the surface of the box? Give a reason for your answer. [1]

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- b) Edison repeated the experiment by adding object X to the setup. He noticed that less weights were needed to move the box across the surface.



- c) What could object X be? Give a reason for your answer. [1]

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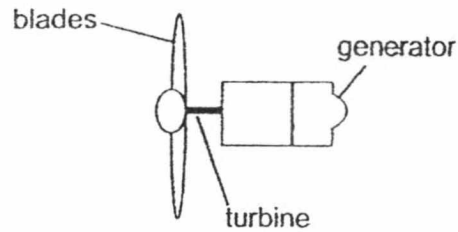
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- d) Using the same type of iron weights and without lifting the box, suggest one way to move the same box across each surface using less iron weights than the number of weights recorded in the above table. Explain your answer. [2]

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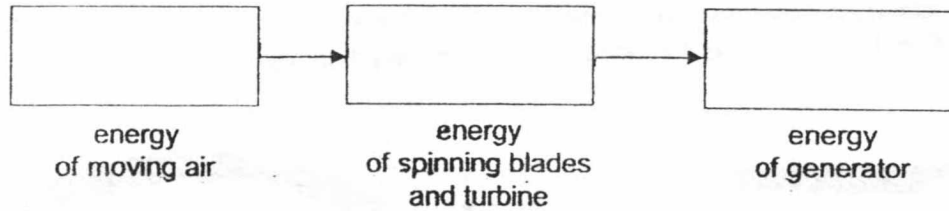
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38. The diagram below shows an air turbine which produces electricity when moving air spins the blades.

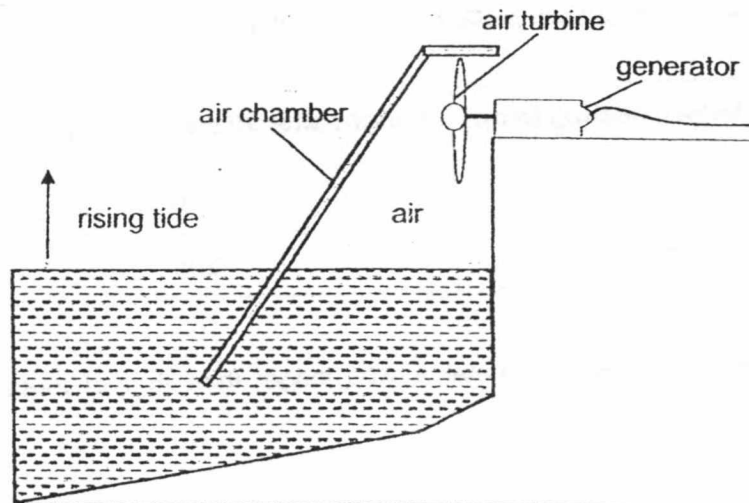


- a) Complete the energy conversion to show how this happens.

[ 1 ]



The diagram below shows a tidal generator which produces electricity from the rising of tides. Tides are the rising and falling of the sea.



- b) Electricity is generated by the generator when the tide rises.  
Explain how this happens.

[ 2 ]

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- c) More electricity is generated when the tide rises faster.  
Explain how this happens.

[ 1 ]

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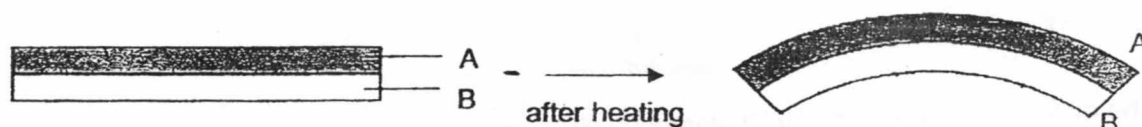
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- d) State one **disadvantage** of the tidal generator compared to a power plant which uses fossil fuel for producing electricity. [ 1 ]

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39. Rashid conducted an experiment by heating a strip, which is made up of metals A and B fixed together, for 20 minutes. He observed that the strip bent as shown in the diagram below.



He also recorded the length of each metal before and after heating in the table below.

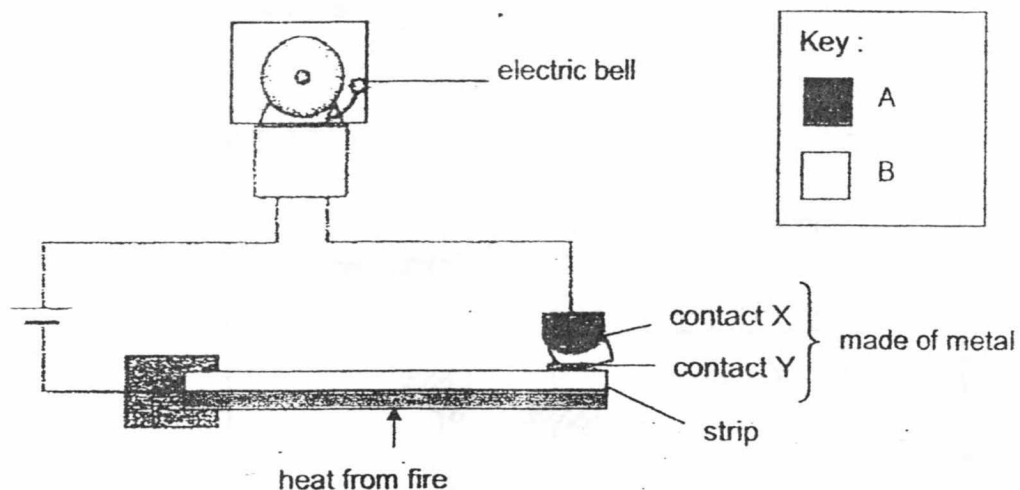
Metal	Length before heating (mm)	Length after 20 min of heating (mm)
A	200	210
B	200	205

- a) Rashid observed that the length of metal A was longer than that of metal B after heating.  
Give a reason for this observation. [ 1 ]

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The same strip was used in the fire alarm system as shown below.



- b) When the strip was heated by a fire the electric bell rang. Explain how. [ 2 ]

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- c) Metals A and B have high melting points. When there is a fire, metals A and B are heated to a high temperature.

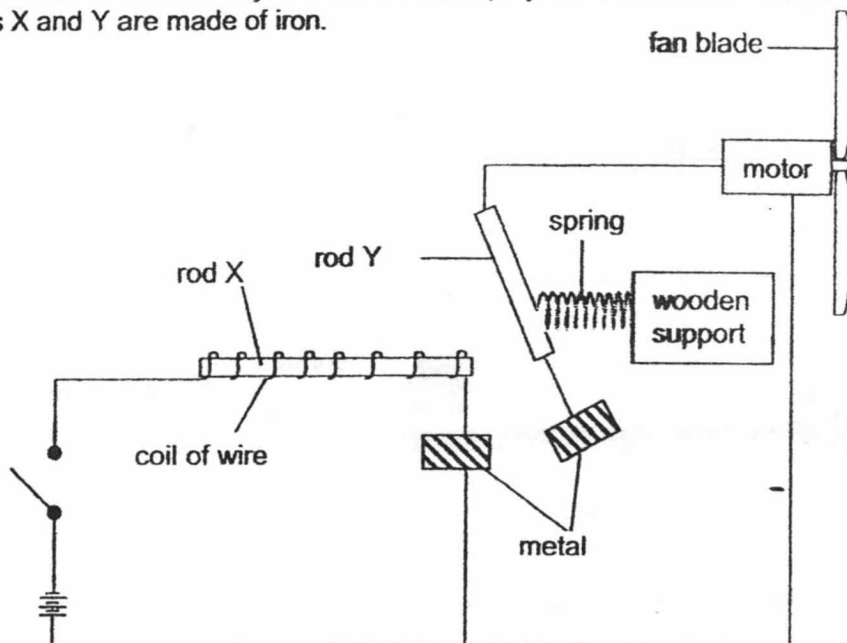
Explain why the fire alarm system will not work if metals with low melting points are used for the strip. [ 1 ]

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SCORE	
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40. Jack made an electrical system for a school project. The circuit is as shown below. Rods X and Y are made of iron.



- a) When the switch is turned on, the motor turns the fan blades. Explain how this happens.

[ 2 ]

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- b) Jack replaced rod Y with a gold rod. Describe what he **would** observe and explain why.

[ 2 ]

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**End of Section B**



**EXAM PAPER 2018**

**LEVEL :** PRIMARY 6  
**SCHOOL :** PEI CHUN PUBLIC SCHOOL  
**SUBJECT :** SCIENCE  
**TERM :** PRELIMINARY EXAM

**BOOKLET A**

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

**BOOKLET B**

- Q29. (a) The electromagnet attracted the iron disc  
(b) No. B had a lower reading than D but had fewer coils around it than D. The number of coils around the materials needs to be the same so that we can compare the reading shown.  
(c) P, It does not exert a force of attraction once it is switched off.
- Q30. (a) There was no more oxygen in the glass jar.  
(b) When there is more oxygen in the glass jar, the flame takes a longer time to go out.  
(c) She should repeat the experiment and find the average of her results.
- Q31. (a) It prevents overcrowding. OR When the seeds grow into young plants, they will compete less with one another for water, sunlight, space and nutrients.  
(b) As the length of roads increase, the distance moved by animals P decrease. Fewer seeds were dispersed/carried by animals, thus plants M were overcrowded and hence the number of young plant M decreased.
- Q32. (a) Tree Y could provide food and shelter for animal X.  
(b) Animal V's population will decrease. Animal V feeds on Y and is eaten by animal W. Animal W is a predator for animals V and Z. Since animal Z has been wiped out, there will be less food for animal W. Thus, animal W will prey on more animal V, causing the population of animal V to decrease.
- Q33. (a) The young and the adult will not compete for food since they are in different surroundings. OR The predators of the adult will not be able to consume the young, as they are not in the same habitat. OR Either the young or the adult will survive when one of the environments become unsuitable for survival. OR Young and adult will not compete for space with each other.  
(b) Predators of X will mistake X for Y, thinking that X stings, so the predators will not feed on X.
- Q34. (a) The amount of carbon dioxide in City X increased from the years 1960 to 2000.  
(b) Carbon dioxide is a greenhouse gas and traps heat, therefore the average annual temperature of city X increased as the amount of carbon dioxide increases.

- Q35. (a) Liquid M: cannot be compressed/has a definite volume.  
Air: can be compressed/has no definite volume.
- (b) Definite volume. No definite shape.
- (c) The air bubbles can be compressed and piston B may not move as much as when piston A moves.
- Q36. (a) Liquid.
- (b) The warm water vapour in the goggles lost heat and condensed on the cooler inner lenses, forming the white mist.
- (c) As the temperature of the water in the pool increases, the time taken for the goggles to become misty increases.
- (d) The goggles are not cold enough, so condensation is less likely to take place.
- Q37. (a) A. The greatest amount of force was required to move it across the surface.
- (b) X could be a magnet. It attracted the iron weight.
- (c) Apply lubricants on the surface. It reduces the amount of friction between the box and the surface, thus less force is required to move the box.
- Q38. (a) Kinetic  $\rightarrow$  Kinetic  $\rightarrow$  Electrical
- (b) When the tide rises the water pushes the air up in the air chamber which spins the turbines and produces electricity in the generator.
- (c) When the tide rises faster, the rising water has more kinetic energy, which will be converted to more electrical energy.
- (d) Electricity can only be produced when the tide is rising or falling
- Q39. (a) Metal A expanded more than metal B after heating.
- (b) When heated, the strip bent. So contact Y moved towards contact X and touched it, forming a closed circuit for the bell to ring.
- (c) The metal will melt. So the circuit is open and the bell will not ring.
- Q40. (a) Rod X will become an electromagnet and will attract rod Y. The circuit will be closed for the motor to turn the fan blades.
- (b) The fan blade will not spin. Rod X will not attract the gold rod as gold is a non-magnetic material. The metal contacts will not touch each other and the circuit is open.