# NANYANG PRIMARY SCHOOL

## 2023
## PRIMARY 6
## WEIGHTED ASSESSMENT

## SCIENCE
## (BOOKLET A)

**Total Time for Booklets A and B: 1 h 45 min**

**INSTRUCTIONS TO CANDIDATES**

1. Write your name and index number in the space provided.
2. Do not open this booklet until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. For each question from 1 to 28, four options are given.
   Indicate your choice in this booklet.
   Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet provided.

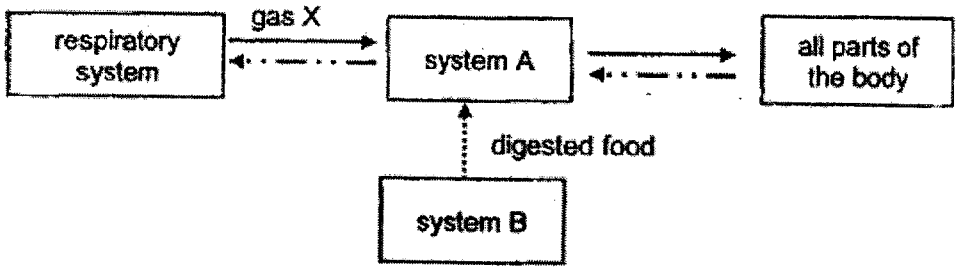
Name: _____ (  )

Class: Primary 6 (  )

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

## Section A: Multiple Choice Questions [56 marks]

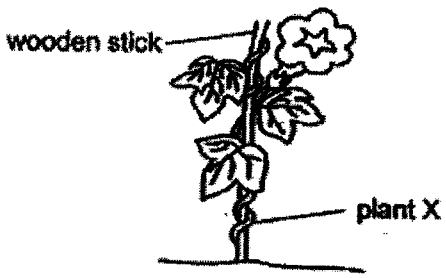
1. Study the diagram below:




Which of the following correctly represent gas X, system A and system B?

| | gas X | system A | system B |
|---|---|---|---|
| (1) | oxygen | digestive system | circulatory system |
| (2) | oxygen | circulatory system | digestive system |
| (3) | carbon dioxide | digestive system | circulatory system |
| (4) | carbon dioxide | circulatory system | digestive system |

2. Lucas found plant X growing around a wooden stick as shown below.




Lucas made the following statements:

A Plant X has a weak stem.
B Plant X supports the wooden stick to stay upright.
C The leaves of plant X makes food for the wooden stick.
D Plant X climbs up the wooden stick for support to get enough sunlight.

Which statements are correct?

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

3. Study the examples given below.
Which of the following processes has been paired with the correct example?

| | Processes | Examples |
|---|---|---|
| (1) | melting | Water turning into ice. |
| (2) | freezing | A puddle of water disappearing. |
| (3) | evaporation | Wet bedsheets drying in the Sun. |
| (4) | condensation | Water vapour forming on the leaves in the morning. |

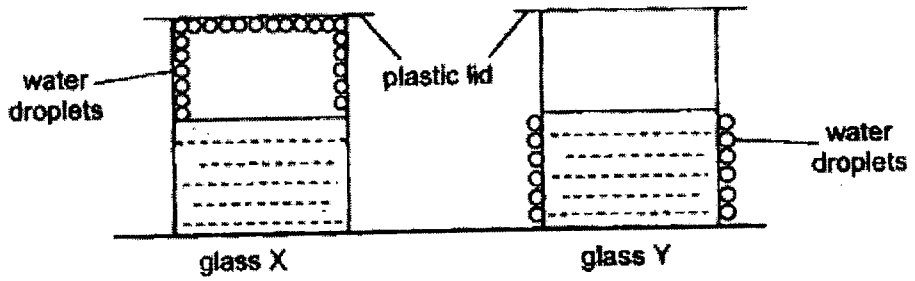
4. During a science lesson, four students made the following statements.

W Pure water boils at 100°C.
X Water gains heat during freezing.
Y Evaporation only takes place at the water surface.
Z Condensation occurs when cooler water vapour comes into contact with a warmer surface.

Which students had made correct statements?

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

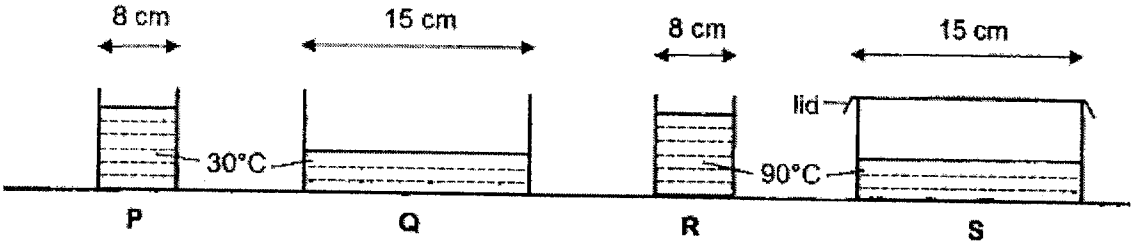
5. Madam Chia placed two identical glasses, X and Y, on the table in the kitchen at 28 °C. She poured the same amount of water into each glass. The temperature of the water in glasses X and Y were different. After 10 minutes, she observed that there were tiny water droplets as shown below.




Based on her observation above, which of the following are possible temperatures of the water in glasses X and Y?

| | Temperature of water in glass X (°C) | Temperature of water in glass Y (°C) |
|---|---|---|
| (1) | 65 | 65 |
| (2) | 5 | 65 |
| (3) | 65 | 5 |
| (4) | 5 | 5 |

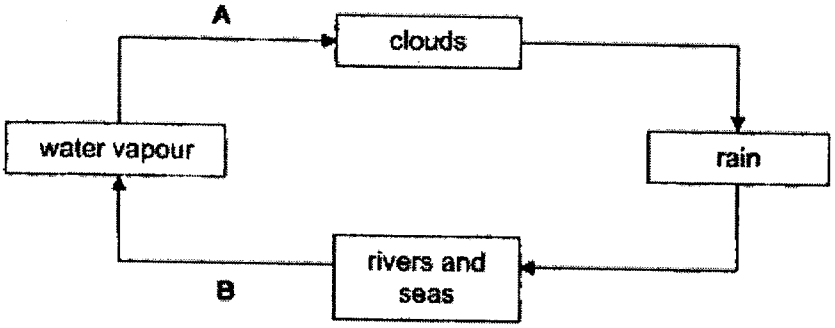
6. Peter conducted an experiment to find out if the temperature of water in a container affects its rate of evaporation. He filled four containers P, Q, R and S, with the same amount of water at various temperatures as shown below. He put the containers on the same table in his classroom.




Which two containers should he use for his experiment?

(1) P and Q only
(2) P and R only
(3) Q and S only
(4) R and S only

7. The diagram below represents the water cycle.




Which of the following about processes A and B are correct?

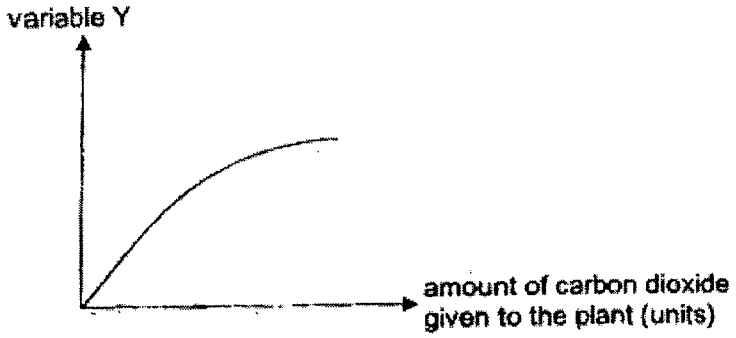
| | Process A | Process B |
|---|---|---|
| (1) | heat gain | heat gain |
| (2) | heat gain | heat loss |
| (3) | heat loss | heat loss |
| (4) | heat loss | heat gain |

8. Which of the following statement(s) is/are **incorrect**?

A Animals need energy to stay alive.
B Energy in our food cannot be traced back to the sun.
C The sun is not the primary source of energy for ferns.

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

9. An experiment was carried out with a green plant. The results were plotted in the graph below.

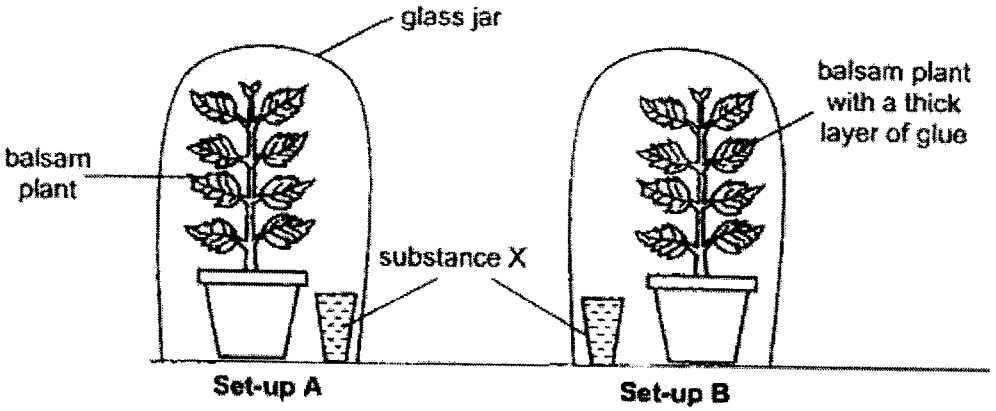



Which of the following could the variable Y represent?

A Amount of sunlight
B Amount of food in the plant
C Amount of oxygen released
D Amount of chlorophyll in the plant

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

10. Ember set up an experiment as shown below. The set-ups, A and B, were placed near the window on a sunny day. She then applied a thick layer of clear glue all over the entire plant in set-up B.



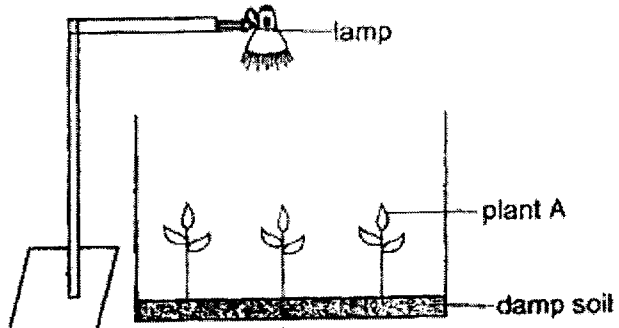

She then placed substance X in each set-up. Substance X will change colour based on the amount of carbon dioxide in the surrounding. The colour of substance X in each set-up at the start of the experiment is red.

| Amount of carbon dioxide | less than normal | normal | more than normal |
|---|---|---|---|
| Colour of substance X | purple | red | yellow |

What will the colour of substance X be in each set-up after an hour on a sunny day and at midnight?

| | Sunny day | | Midnight | |
|---|---|---|---|---|
| | A | B | A | B |
| (1) | purple | red | yellow | red |
| (2) | yellow | red | purple | red |
| (3) | purple | purple | yellow | yellow |
| (4) | yellow | purple | purple | yellow |

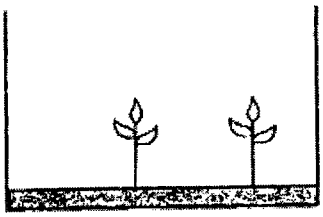
11. Kate wanted to find out if light is needed for photosynthesis of plant A. She set up X in a dark room as shown below.



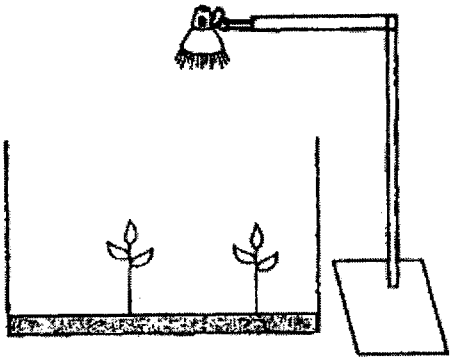

Set-up X

Which of the following set-up should she use to compare against set-up X?

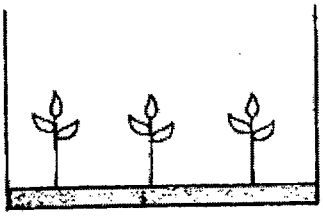
(1)



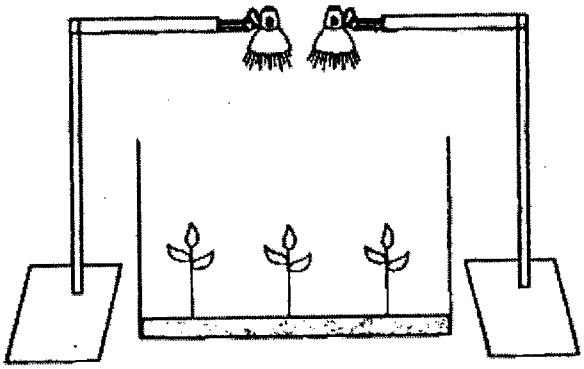
(2)



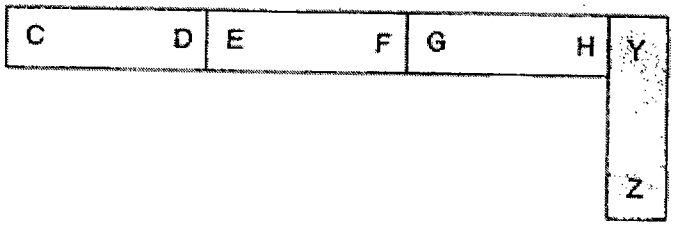
(3)



(4)

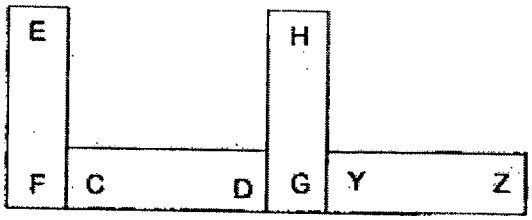


12. Mr Tan arranged three bar magnets CD, EF, GH and an iron bar YZ, as shown below.

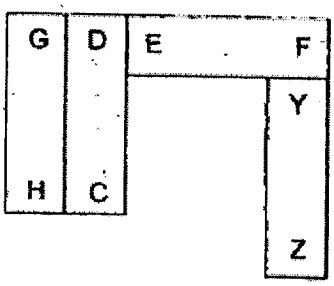



Which one of the following re-arrangements is **not** possible?

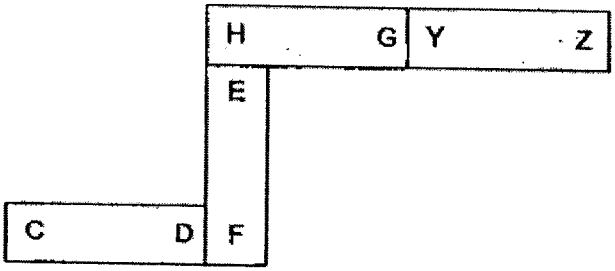
(1)



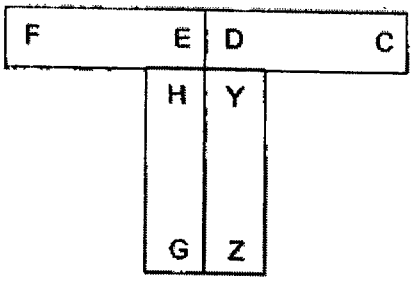

(2)



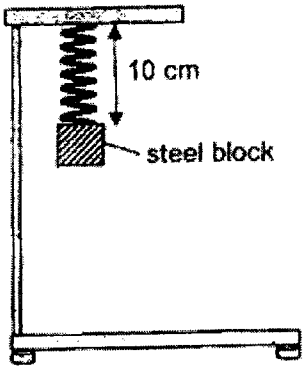

(3)



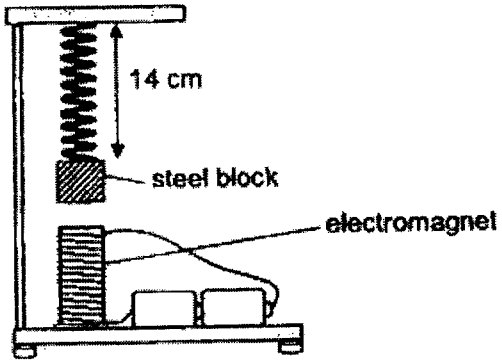

(4)



13. Leslie attached a steel block to a spring and hung it on a stand as shown below. She measured the length of the spring which was 10 cm.



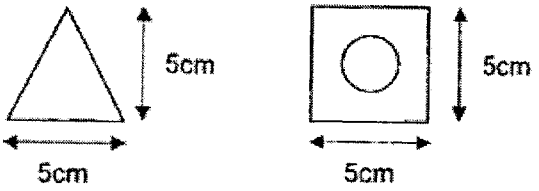

Then, she placed an electromagnet under the steel block and observed that the steel block was attracted to the electromagnet as shown below. She recorded the new length of the spring which was 14 cm.




Which of the following is true if Leslie were to connect one more battery correctly in series to the electromagnet?

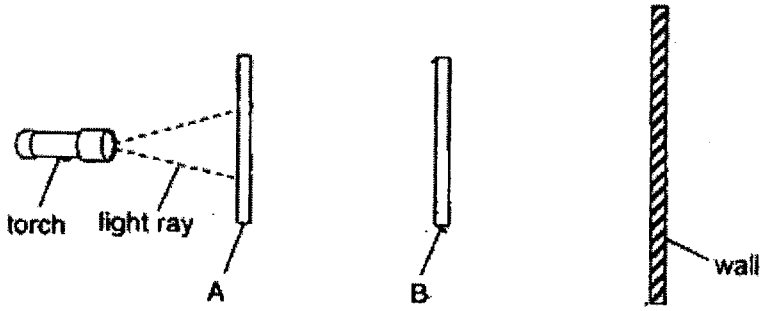
| | Length of spring (cm) | Strength of electromagnet |
|---|---|---|
| (1) | 12 | decreased |
| (2) | 12 | increased |
| (3) | 16 | decreased |
| (4) | 16 | increased |

14. Ming Kiat cut out shapes A and B from two different materials as shown below. Shape A is a triangle made of green tracing paper. Shape B is a square cardboard with a hole in the middle.




shape A shape B

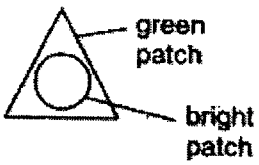
Ming Kiat placed shapes A and B in a straight line, 20 cm apart, in front of the wall and turned on the torch as shown below.



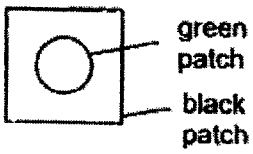

Which of the following shows what Ming Kiat would observe on the wall?

(1)

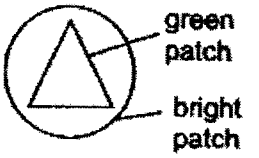

(2)



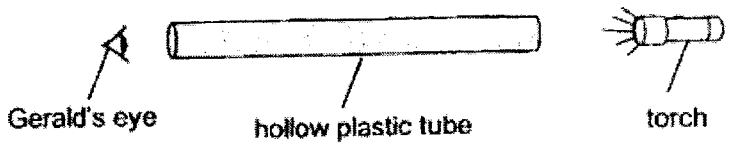

(3)




(4)



15. Gerald looked at a lit torch through a hollow plastic tube.

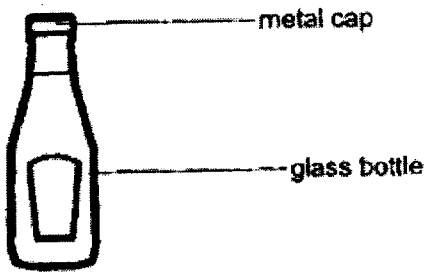



Which of the following correctly explains why Gerald was able to see the lit torch through the hollow plastic tube?

A The hollow plastic tube is a light source.
B Light from the lit torch enters Gerald's eyes.
C Light from the lit torch travels in a straight line.

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

16. Emma could not open the metal cap on the glass bottle shown below.

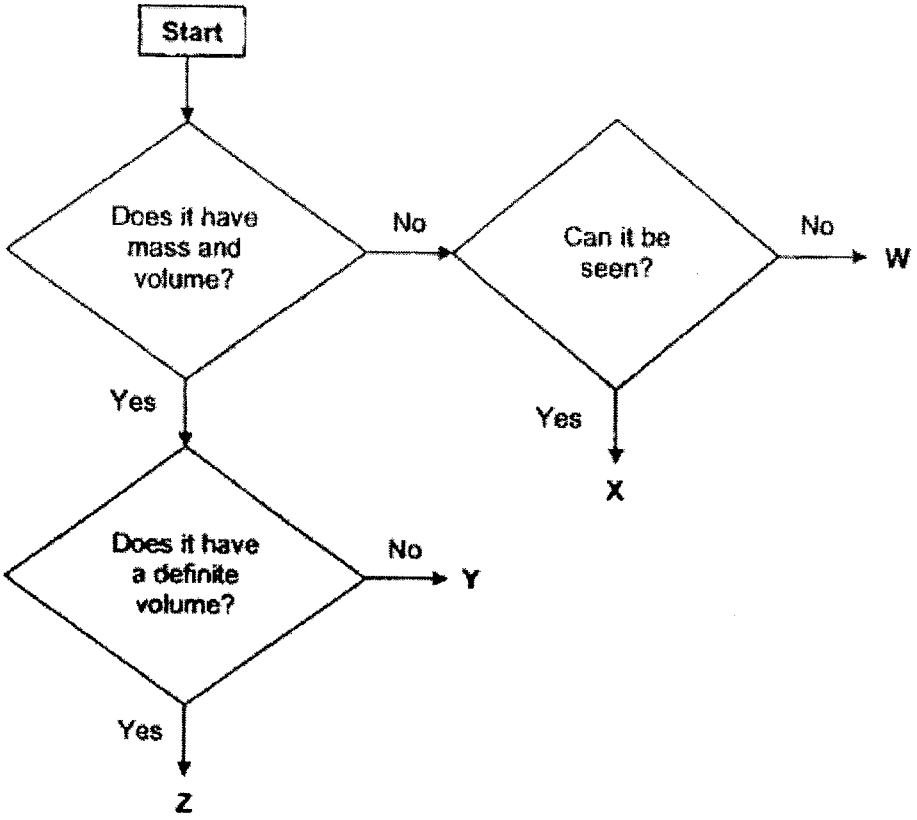



Which of the following way(s) can help Emma remove the metal cap from the glass bottle?

A Heat up the glass bottle.
B Place the entire bottle in cold water.
C Wrap a cold towel around the metal cap.

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

17. Study the flowchart below carefully.

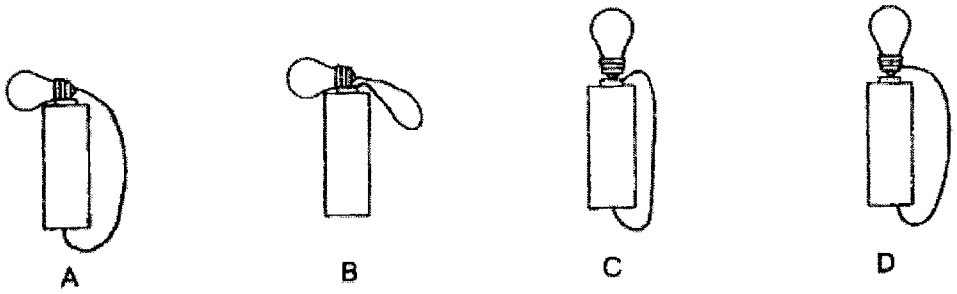



Based on the flowchart above, which of the following statements are correct?

A W can be thunder.
B Z can only be a solid.
C X is a matter but W is not a matter.
D Y can be compressed but Z cannot be compressed.

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

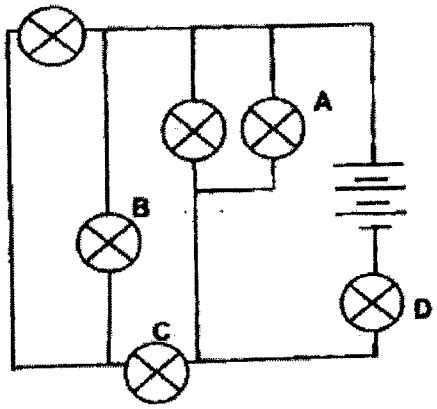
18. Vanessa connected a battery, a bulb and a wire in 4 different arrangements, A, B, C and D, as shown below. All the electrical components were working properly.




In which arrangements will the bulb light up?

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

19. Study the circuit diagram below.

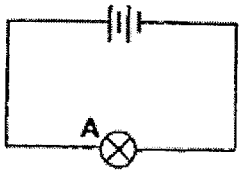



When one of the bulbs is not working, only three bulbs remain lit.

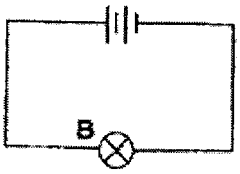
Which bulb is not working?

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

20. Justin conducted an experiment using two different circuits.




Circuit A



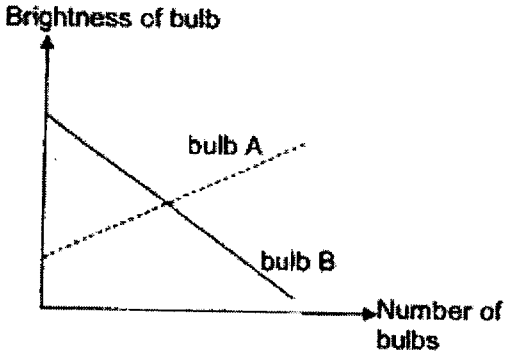

Circuit B

He kept adding identical bulbs in series to the bulb in circuit A.
He then added identical bulbs in parallel to the bulb in circuit B.

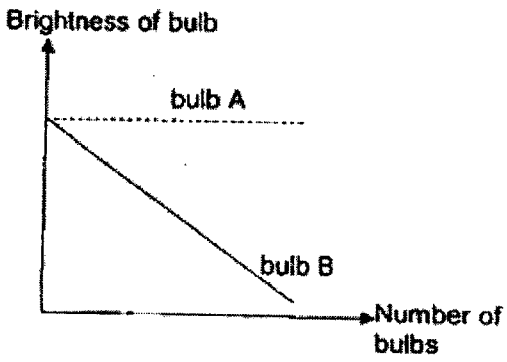
Justin measured the brightness of the bulb each time and recorded his observations in a graph.

Which of the following graphs correctly represents the results of his experiment?

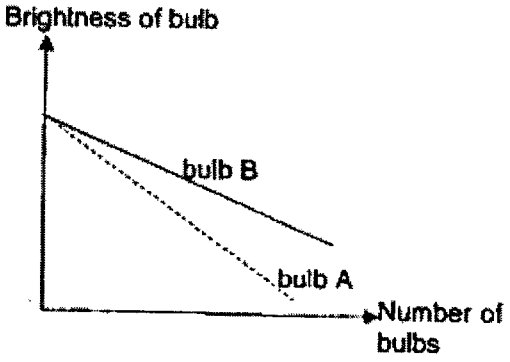
(1)



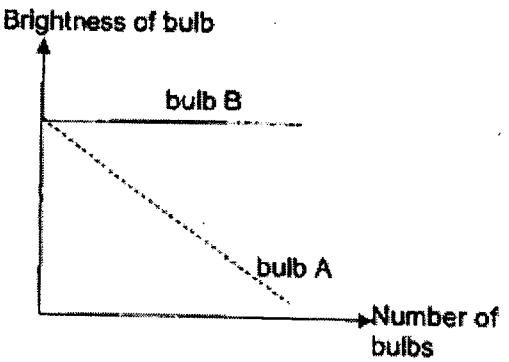

(2)



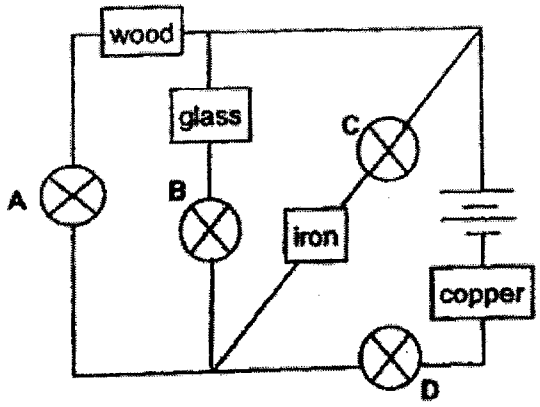

(3)




(4)



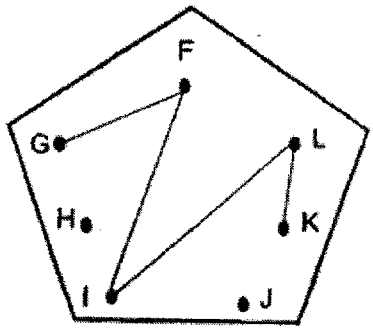
21. Erika set up a circuit using 2 batteries, 4 working bulbs and some wires. She then placed 4 objects in the circuit as shown below.




Based on the information, which bulb(s) will light up?

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

22. Reagan made a circuit card, and the clips of the circuit card were tested with a circuit tester. The arrangement of his circuit card is shown below.




Based on the arrangement of his circuit card, which of the following shows the correct results?

(1)

| | Bulb of circuit tester |
|---|---|
| F and G | Light up |
| L and K | Light up |
| J and K | Light up |

(2)

| Clips | Bulb of circuit tester |
|---|---|
| F and H | Light up |
| G and I | Light up |
| L and K | Did not light up |

(3)

| Clips | Bulb of circuit tester |
|---|---|
| F and I | Did not light up |
| H and I | Light up |
| J and G | Light up |

(4)

| Clips | Bulb of circuit tester |
|---|---|
| L and K | Light up |
| G and H | Did not light up |
| G and F | Light up |

23. Study the table below.

| Forms of Energy | | |
|---|---|---|
| A | B | C |
| moving air | fire alarm ringing | rice |
| flowing river | whistling | compressed spring |

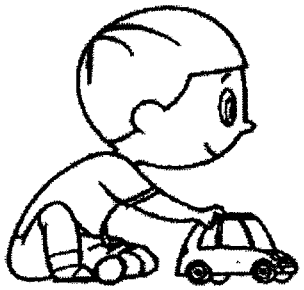
Which of the following headings correctly represent the forms of energy for examples A, B and C?

| | A | B | C |
|---|---|---|---|
| (1) | kinetic | kinetic | potential |
| (2) | potential | sound | kinetic |
| (3) | kinetic | sound | potential |
| (4) | sound | kinetic | potential |

24. Which of the following is not an example of energy conversion from potential energy to kinetic energy?

(1) a boy running in a race
(2) an apple falling from a tree
(3) a ball rolling down the slope
(4) a bulb lighting up in a circuit

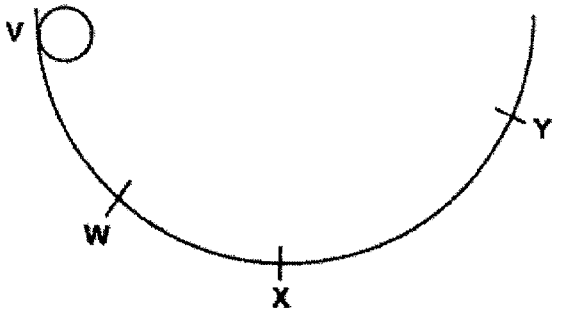
25. The diagram below shows a boy pushing a toy car. The toy car moved forward.



Which one of the following correctly identifies the main energy changes in the boy as he plays with the toy car?

(1) potential energy → heat energy
(2) potential energy → kinetic energy
(3) kinetic energy → sound energy
(4) kinetic energy → potential energy

26. The diagram below shows a toy made by Amy. She dropped a ball at position V and the ball rolled downwards to Y, then back to W. It continued to roll back and forth a few more times before stopping at X.

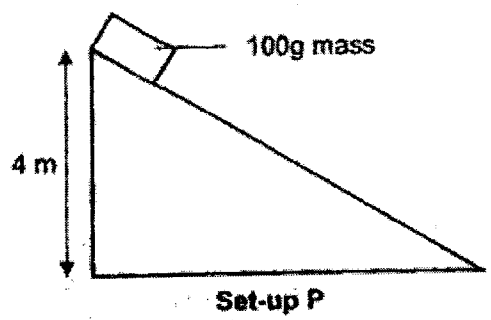



Which of the following statement(s) explains her observations?

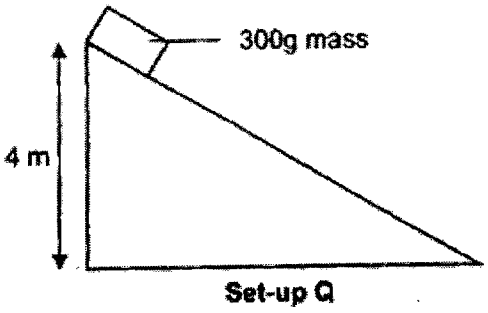
A At point Y, the ball had the most heat energy.
B At point V, the ball had the most gravitational potential energy.
C When the ball stopped at point X, it had the most kinetic energy

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

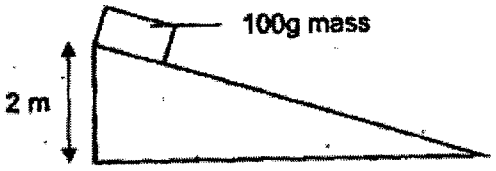
27. Alyssa conducted an experiment with two metal blocks of the same size but of different mass. She released the blocks from two different heights as shown in set-ups P, Q, R and S below.



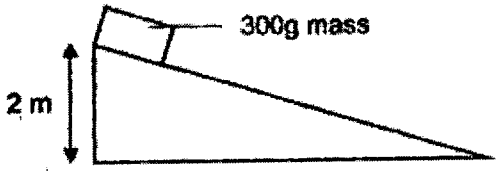

Set-up P




Set-up Q




Set-up R




Set-up S

She wanted to investigate if the gravitational potential energy of the block is affected by its mass and height.

Which pairs of set-ups should she use in her investigation?

| | Effect of height on gravitational potential energy | Effect of mass on gravitational potential energy |
|---|---|---|
| (1) | R and S | P and Q |
| (2) | Q and S | R and S |
| (3) | P and R | Q and S |
| (4) | P and Q | P and R |

28. A block of wood was released at the top of a slope and it slid down to point Z. The graph below shows the amount of different types of energy possessed by the block at point X before it was released.
(KE = kinetic energy, PE = potential energy)

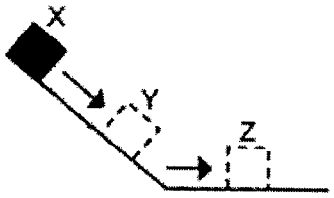
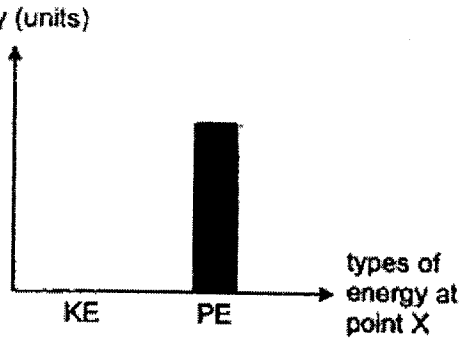
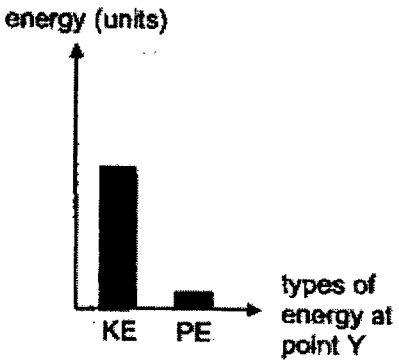


Diagram 1

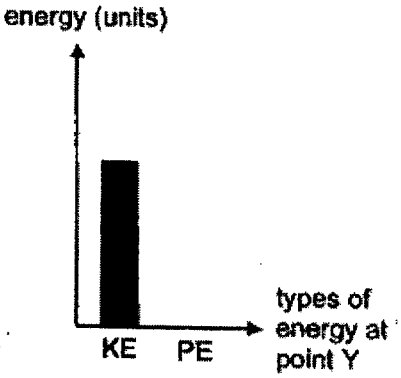



Which one of the graphs below correctly shows the amounts of different types of energy possessed by the block of wood at point Y when it is continuously moving from point X to point Z?

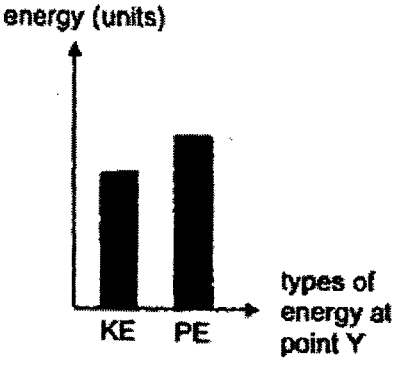
(1)



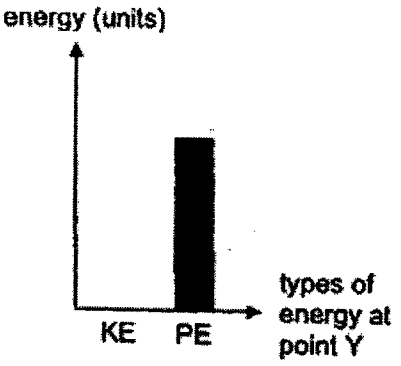

(2)




(3)




(4)




**~ END OF BOOKLET A ~**

# NANYANG PRIMARY SCHOOL

## 2023
## PRIMARY 6
## WEIGHTED ASSESSMENT

## SCIENCE
## (BOOKLET B)

**Total Time for Booklets A and B: 1 h 45 min**

**INSTRUCTIONS TO CANDIDATES**

1. Write your name and index number in the space provided.
2. Do not open this booklet until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Write your answers to Questions 29 to 40 in the spaces provided.

| | | |
|---|---|---|
| **Booklet A:** | | **56** |
| **Booklet B:** | | **44** |
| **Total:** | | **100** |

Name: _____ (  )

Class: Primary 6 (  )

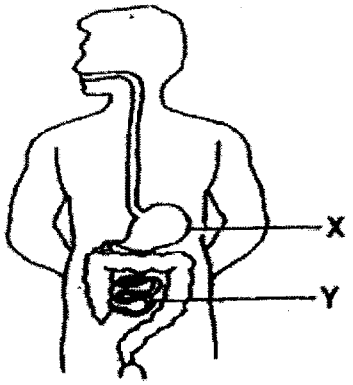
Parent's signature: _____

**Please sign and return the paper the next day. Any queries should be raised at the same time when returning the paper.**

Booklet B consists of 17 printed pages excluding this cover page.

**Section B: Open-Ended Questions [44 marks]**

29. The diagram shows a human body system.




(a) Identify part X. [1]

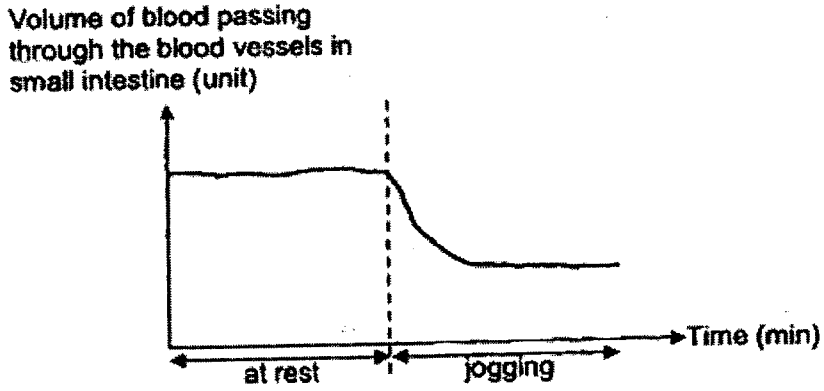
_____

(b) State the 2 functions of part Y. [1]

(i) _____

(ii) _____

The diagram below shows the volume of blood passing through the blood vessel in the small intestine during rest and when jogging over a period of time.




(c) Based on the graph above, describe and explain how jogging after a meal affects the amount of digested food absorbed into the blood in the small intestine. [2]

_____

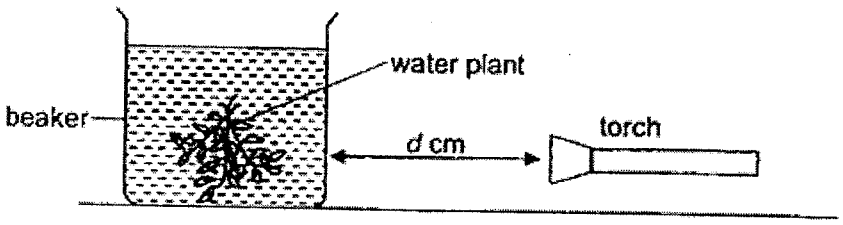
_____

_____



4

30. Maureen wanted to find out how the intensity of light affects the rate of photosynthesis. She set up the experiment in a dark room as shown below.




After switching on the torch, she recorded the number of bubbles released by the plant per minute. She then repeated the experiment by changing the distance between the torch and the beaker, *d*. The results are shown in the table below.

| Distance *d* (cm) | Number of bubbles observed per minute |
|---|---|
| 12 | 2 |
| 10 | 4 |
| 8 | 6 |
| 6 | 10 |
| 4 | 10 |
| 2 | 10 |

(a) State how the distance between the torch and the beaker affects the number of bubbles observed per minute. [1]

_____

_____

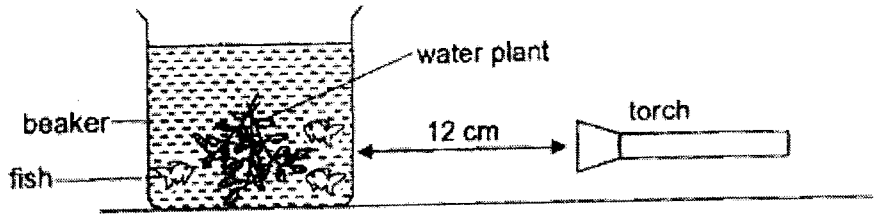
(b) Without changing the light intensity, what change could Maureen do to the set-up to increase the number of bubbles produced by the plant. [1]

_____

_____

(Continue from Q30)

Maureen then added a few fishes in the beaker and placed the torchlight 12 cm away from the tank.

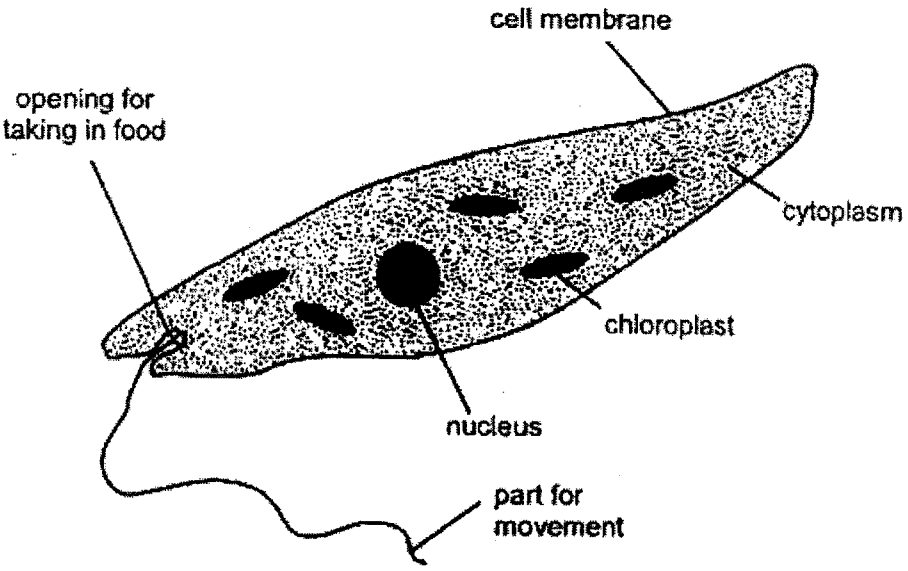



(c) Explain why there was an increase in the number of bubbles given out by the water plant after adding the fishes. [2]



2

31. The diagram below shows organism P. It has characteristics of both plant and animal cells.

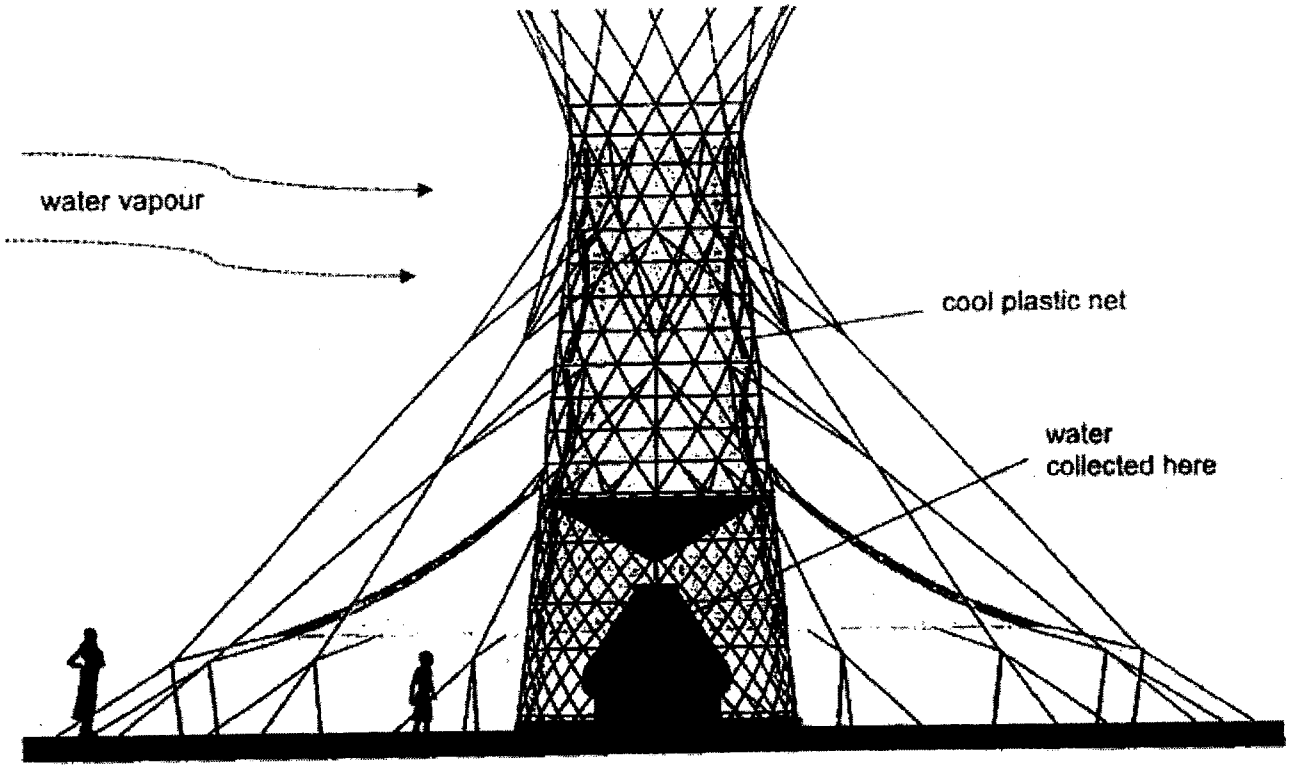



(a) State the function of the cell membrane. [1]

(b) With reference to the cells parts present in organism P, give a reason why this organism cannot be classified as a plant. [1]

(c) With reference to the cell parts present in organism P, describe how it can survive when it cannot find food to eat? [1]

32. In a small village which experiences very little rainfall, a structure made of cool plastic net was built to collect water from the water vapour in the air as shown below.




This structure is able to provide the villagers with about 100 litres of clean water daily.

(a) Why is it important for the plastic net to be kept cooler than the surrounding? [1]

(b) Explain the processes involved that enabled water to be collected at the base of the structure. [2]

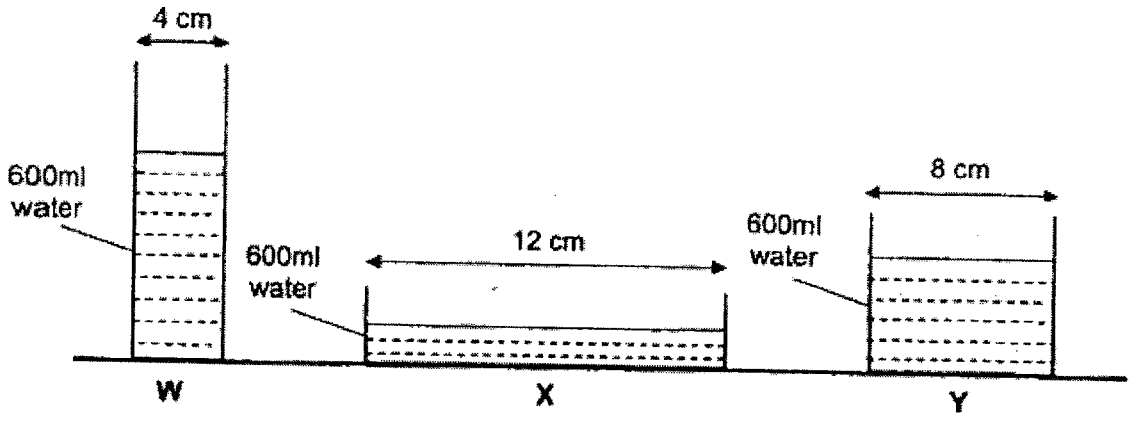
There is limited water supply in this village.

(c) What can the villagers do to conserve the water collected? [1]



4

33. Maisy carried out an experiment using three containers with different exposed surface areas W, X and Y, as shown below. She poured 600ml of water from the same jug into each of the container and left them on the teacher's table in the science laboratory. She then measured the amount of water left in each container after 6 hours.




(a) State the aim of her experiment [1]

After 6 hours, Maisy observed that container X has the least amount of water left.

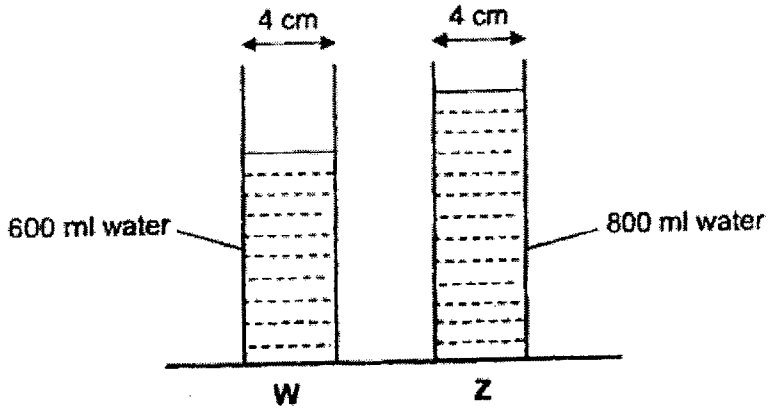
(b) Based on the diagram above, explain her observation. [1]



2

(Continue from Q33)

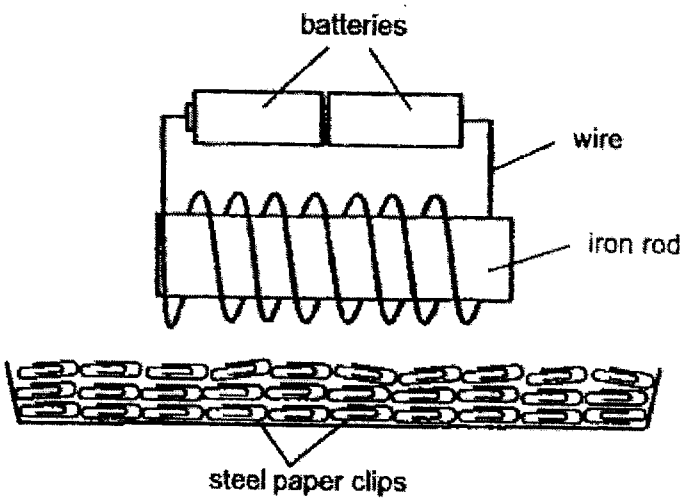
Next, Maisy carried out another experiment where she poured 600 ml and 800 ml of water from the same jug into similar containers W and Z respectively. She left the two set-ups on the teacher's table in the science laboratory as shown below.



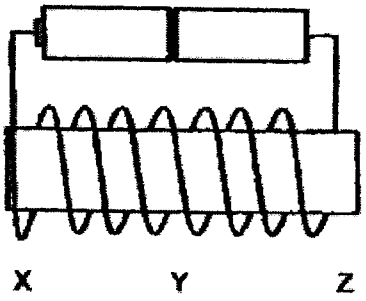

The amount of water left in container W was 400 ml after 6 hours.

(c) Explain why there was 600 ml of water left in container Z after 6 hours. [2]

34. Geraldine made an electromagnet using 2 new batteries, a piece of wire and an iron rod. She lowered the electromagnet towards a plate of steel paper clips as shown below.




She observed that the steel paper clips were attracted to the electromagnet at different parts.




(a) Based on the table below, which is the most likely result that Geraldine will get? Give a reason for your answer. [1]

| | X | Y | Z |
|---|---|---|---|
| **Result 1** | 9 | 2 | 9 |
| **Result 2** | 2 | 8 | 2 |
| **Result 3** | 9 | 9 | 8 |

(b) Give a reason why the steels clips are attracted to the electromagnet. [1]

(Continue from Q34)

(c) Without adding more batteries, state one change Geraldine can make to the set-up above to enable the iron rod to attract **more** steel paper clips? [1]

_____

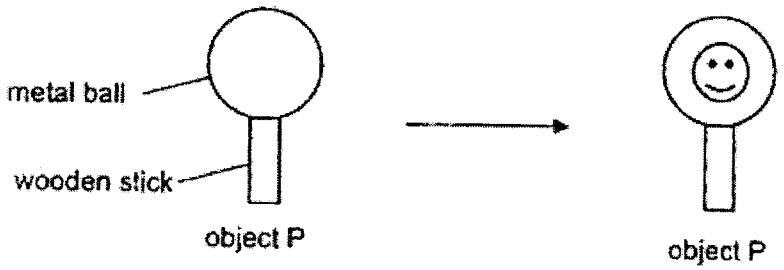
_____

(d) What would be observed if Geraldine replaced all the steel paper clips in the set-up with aluminium paper clips? Explain your answer. [1]

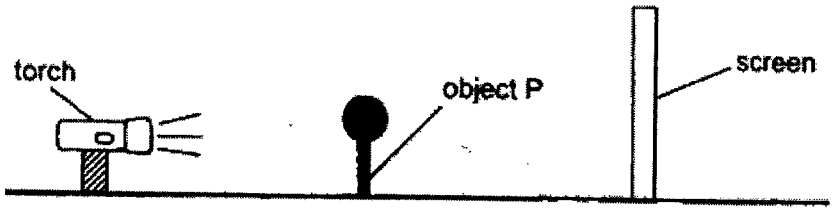
_____

_____

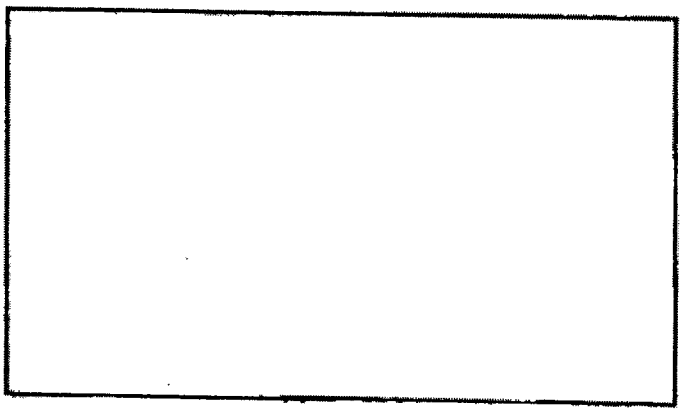
35. Tan Kiat made object P using a metal ball and wooden stick. Using a marker, he drew a smiley face on object P as shown below.




He placed object P between a torch and a white screen as shown below.




(a) In the box below, draw the shadow formed on the screen when the torch was lit. [2]

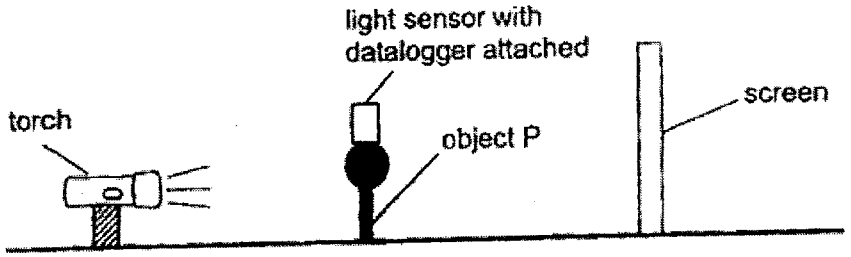




2

(Continue from Q35)

Using the same set-up, Tan Kiat then taped a light sensor on object P to measure the amount of light shone at object P as shown below.




He conducted an experiment using the above set-up by changing the position of one of the items in the set-up and recorded the readings on the datalogger for each position in the table below.

| Height of shadow formed on screen (cm) | Amount of light detected by light sensor (units) |
|---|---|
| 45 | 20 |
| 57 | 20 |
| 69 | 20 |
| 82 | 20 |

(b) Based on the table above, which one of the following change(s) did Tan Kiat most likely make? Put a tick (✓) in the correct box(es) below. [1]

| | | |
|---|---|---|
| (i) | The torch was moved nearer to object P. | ☐ |
| (ii) | Object P was moved nearer to the screen. | ☐ |
| (iii) | The screen was moved away from object P. | ☐ |

(c) What can Tan Kiat do to ensure that the results of his experiment are reliable? [1]

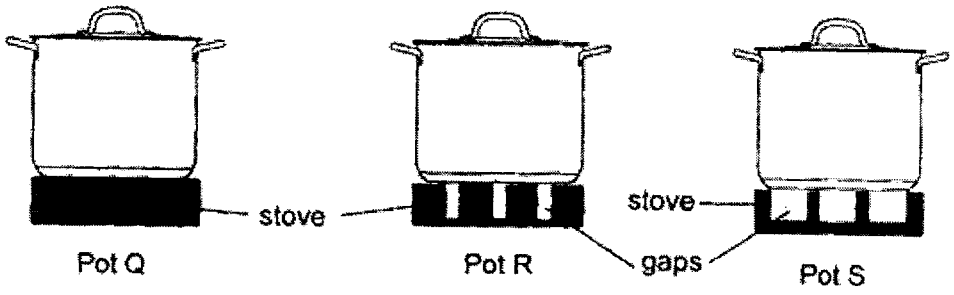
_____

_____



2

36. Cole placed three identical pots, Q, R and S, on stoves with similar materials but of different surfaces. He poured 500 ml of water into each pot and turned on the stoves.



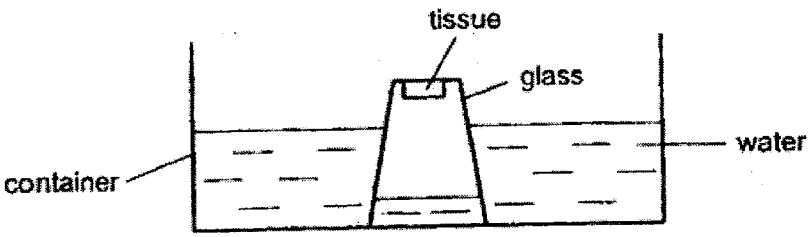

(a) Based on the diagram above, which pot of water will take the fastest time to boil? Explain your answer. [2]

Cole then poured 300 ml of boiling water into 4 identical cups of different materials W, X, Y and Z. After 30 minutes, he recorded the temperature of the water in each cup in the table as shown below.

| Material | Temperature of water (°C) |
|---|---|
| W | 30 |
| X | 80 |
| Y | 40 |
| Z | 60 |

(b) Based on the results, which material, W, X, Y or Z, is the most suitable for making an oven mitten to protect Cole's hand from hot objects? Explain your answer. [2]

37. Le Min filled a container with water and lowered an empty glass with a piece of tissue pasted at the bottom into the water as shown below. She did not tilt the glass.




Le Min observed that some water entered the glass as shown above.

(a) Using the property of matter, explain why water was able to enter the glass. [1]

_____

_____

After the end of the experiment, Le Min observed that the piece of tissue pasted at the bottom of the glass remained dry.

(b) Using the property of matter, explain why the tissue remained dry. [1]

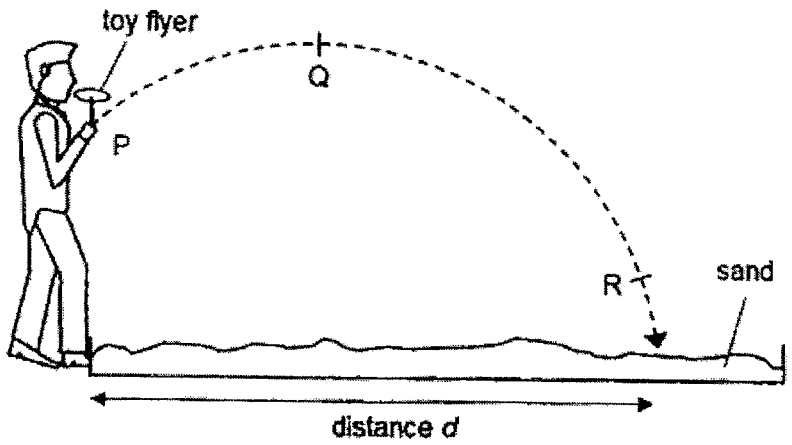
_____

_____



2

38. Tommy carried out an experiment on 3 toy flyers, X, Y and Z, using the set-up shown below. The flyers have similar size but different masses.




He launched all the toy flyers from the same staring position P. The toy flyer moved from P to Q to R, before landing on the sand. He recorded the distance (*d*) travelled by the three flyers in the table below.

| | Distance *d* (cm) | | |
|---|---|---|---|
| | 1st try | 2nd try | 3rd try |
| Flyer X (mass = 30g) | 340 | 330 | 360 |
| Flyer Y (mass = 40g) | 310 | 290 | 280 |
| Flyer Z (mass = 50g) | 210 | 240 | 230 |

(a) State the main form(s) of energy possessed by the flyer at position Q.

_____

(b) Based on the results above, how did the mass of the flyer affect the distance it moved? [1]

_____

_____

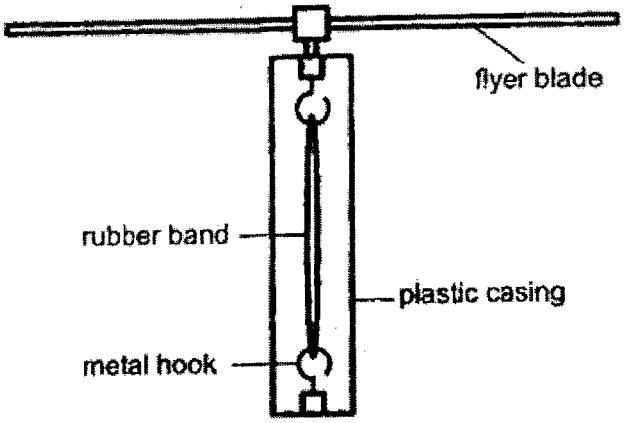
(c) State a possible reason why flyer X travelled different distances for each of its 3 tries. [1]

_____

_____

(Continue from Q38)

The diagram below shows how the flyer works. Tommy turns the flyer blade a few times to wind up the rubber band before releasing it.




Tommy was able to make the flyer fly further by increasing the number of turns of the rubber band and using a flyer with less mass.

(d) State one other change that can be made to the flyer parts to let it fly further. [1]

_____

Tommy repeated his experiment on a flat concrete floor instead of sand.

(e) Give a reason why his results would not be accurate. [1]

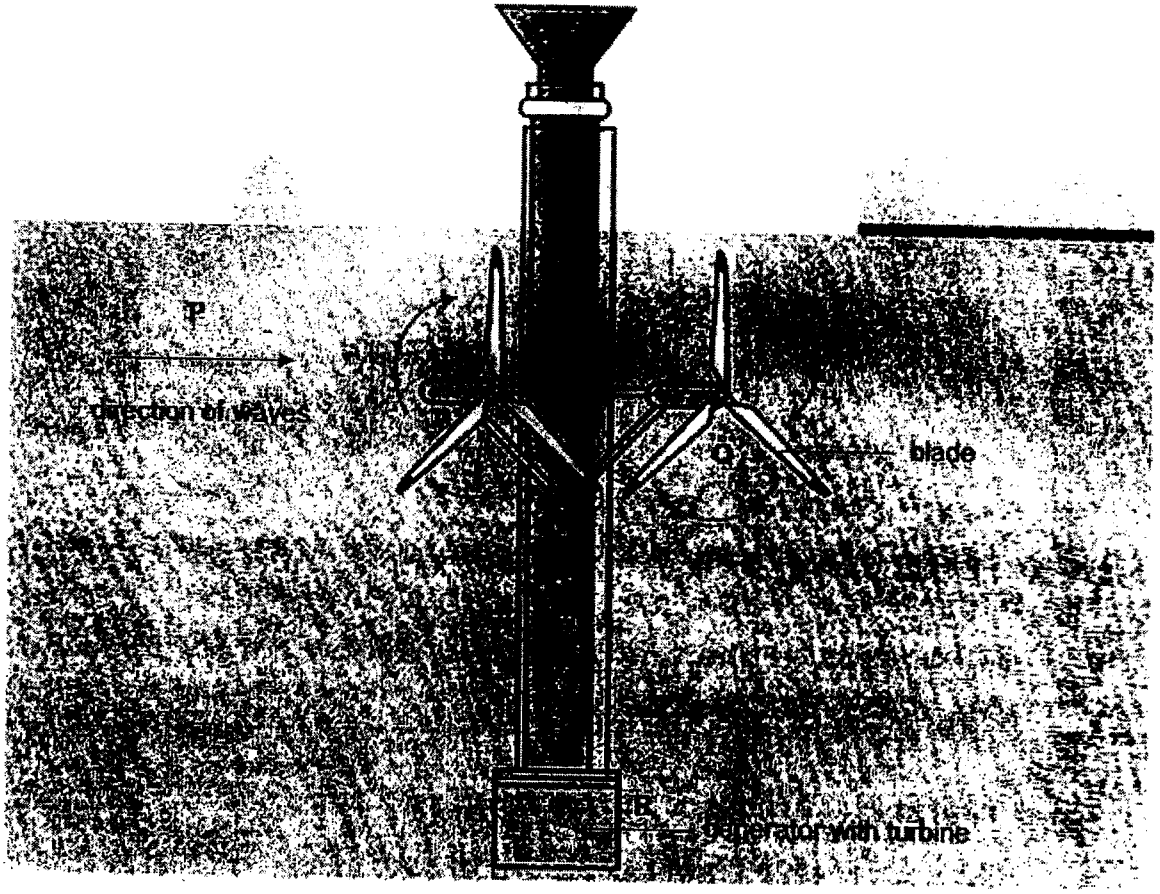
_____

_____



2

39. The diagram below shows a tidal power station. The water turns the blades which then turns the turbine in the generator to produce electricity.




(a) State the main forms of energy at P and at Q. [1]

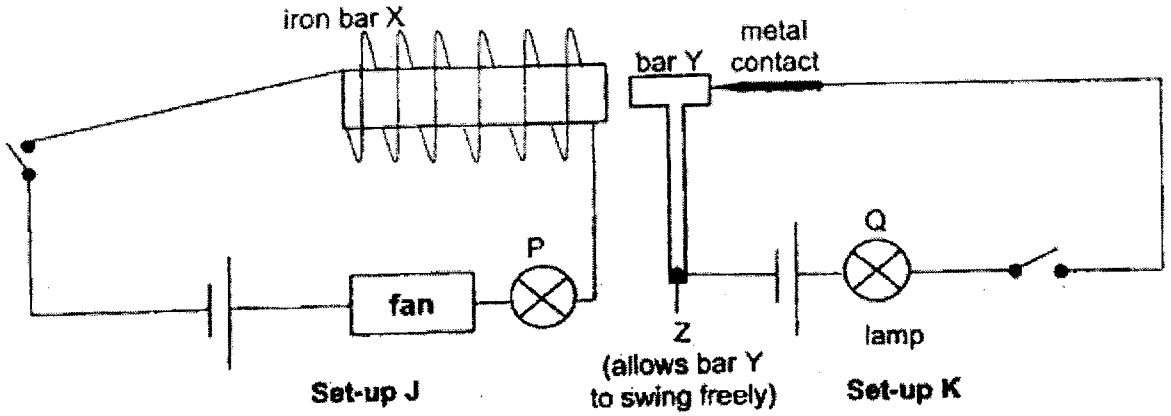
| | | | | |
|---|---|---|---|---|
| | → | | → | electrical energy |
| (waves at P) | | (spinning blades at Q) | | (generator) |

(b) Explain why less electricity is generated when the speed of the waves decreases. [1]



2

40. Molly created two electrical systems, J and K, in her doll house as shown below. Set-up J has lamp P and a fan. Set-up K has lamp Q. The system prevents both lamp P and Q from being turned on at the same time.




(a) State two properties of bar Y that allows the system to work. [1]

(i) _____

(ii) _____

(b) Based on the diagram above, explain how the system prevents lamps P and Q from being turned on at the same time when both switches are closed. [2]

_____

_____

_____

Molly turned off the switch in set-up J and added an additional battery to set-up K. She noticed that bulb Q in set-up K did not light up. All batteries and bulbs were still in working condition.

(c) Suggest a possible reason why bulb Q did not light up. [1]

_____

_____

**~ END OF BOOKLET B ~**

## Suggested Answer Key – P6 WA1 2023

Section A

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 6 | 2 | 11 | 3 | 16 | 1 | 21 | 3 | 26 | 2 |
| 2 | 2 | 7 | 4 | 12 | 3 | 17 | 1 | 22 | 4 | 27 | 2 |
| 3 | 3 | 8 | 3 | 13 | 4 | 18 | 1 | 23 | 3 | 28 | 1 |
| 4 | 1 | 9 | 3 | 14 | 3 | 19 | 3 | 24 | 4 | | |
| 5 | 3 | 10 | 1 | 15 | 3 | 20 | 4 | 25 | 2 | | |

Section B

| Qn No | | Answer |
|---|---|---|
| 29 | a | Stomach |
| | b | Breaks down food into simpler substances and absorbs digested food into the bloodstream |
| | c | Data: Less volume of blood pass through the small intestine<br>Explain: Less digested food absorbed into the blood |
| 30 | a | As the distance between the torchlight and the beaker decreases until 6 cm, the number of bubbles observed increases. From 6 cm or lesser, the bubbles observed remain the same. |
| | b | Add water plants / baking soda |
| | c | The fishes give out carbon dioxide so there is more carbon dioxide. The plant photosynthesizes faster, producing (more) oxygen. |
| 31 | a | To control the movement of substances entering and leaving the cell. |
| | b | It does not have a cell wall |
| | c | It has chloroplasts to make its own food. |
| 32 | a | So that condensation can occur |
| | b | Warmer water vapour in the air loses heat and condenses on the cooler (surface) of the plastic net. |
| | c | Using half flush instead of full flush / Taking shorter showers / Washing clothes only when there is full load |
| 33 | a | To find out how the exposed surface area (of the water) affects the rate of evaporation / the amount of water left in each container. |
| | b | The water in container X has the biggest exposed surface area. Hence, most water can evaporate so the amount of water left is the least. |
| | c | Water in container W and Z has the same exposed surface area so the rate of evaporation of water in Z and W is the same. Since 200ml of water evaporated from W, 200ml of water will evaporate from Z. |
| 34 | a | Choice: Result 1<br>Data: The electromagnet attracted the most steel paper clips at X and Z.<br>Explain: The poles of the electromagnet have the strongest magnetic strength. |
| | b | Steel is a magnetic material. |
| | c | Increase the number of coils of wire around the iron rod / Use batteries with higher voltage |
| | d | The aluminium paper clips will not be attracted by the electromagnet as aluminium is not a magnetic material. |
| 35 | a |  |
| | b | Tick box (iii) |
| | c | Repeat the experiment at least 3 times and find the average results. |
| 36 | a | Choice: Q<br>Data: The base of the pot was in most contact with the stove/ the pot was in direct contact with the stove.<br>Explain: The pot gains heat the fastest from the stove and the water boils the fastest. |
| | | |

| | | |
|---|---|---|
| | b | Choice: X<br>Data: The temperature of water is the highest.<br>Explain: X is the poorest conductor of heat. Oven mitten conducts heat to the hand slowest. |
| 37 | a | Air can be compressed / Air has no definite volume. |
| | b | The air in the glass occupies space and prevents the water from reaching the tissue. |
| 38 | a | kinetic energy and (gravitational) potential energy |
| | b | The lesser the mass of the flyer, the greater the distance it moved. |
| | c | He released the flyer at different speeds / force / strength / power / energy / angle. |
| | d | Use a shorter / thicker rubberband. |
| | e | The flyer would move / slide / skid along the floor after landing. |
| 39 | a | waves at P: kinetic<br>spinning blades at Q: kinetic |
| | b | Less kinetic energy in the waves is converted into less kinetic energy in the blades. |
| 40 | a | conductor of electricity; magnetic material |
| | b | There is a closed circuit. The iron bar becomes an electromagnet and attracts bar Y. This forms an open circuit. |
| | c | The battery was in the wrong arrangement / the batteries were connected wrongly. |