

Name: _____ ()

Class: Primary 6 _____

Primary 6
Preliminary Examination – 2017
SCIENCE
BOOKLET A

24 August 2017

Total Time for Booklets A and B: 1 hour 45 minutes

28 questions
56 marks

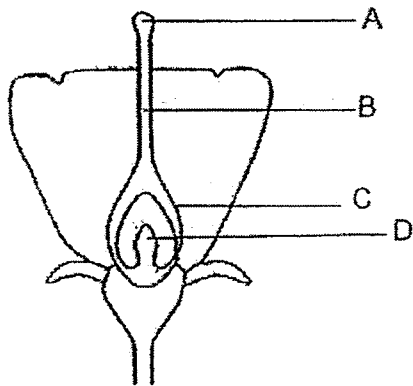
Do not open this booklet until you are told to do so.
Follow all instructions carefully.
Answer all questions.

This booklet consists of 16 printed pages.

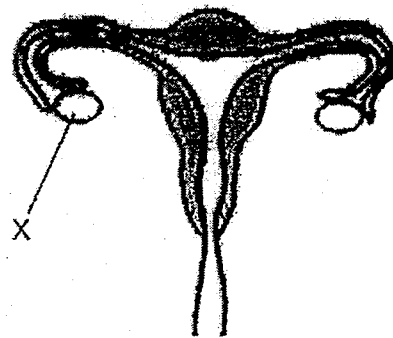
PART I

For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4) and shade your answer on the **Optical Answer Sheet**.
(56 marks)

1. The diagrams below show parts of the reproductive systems of a flowering plant and a human.



Reproductive system of a plant

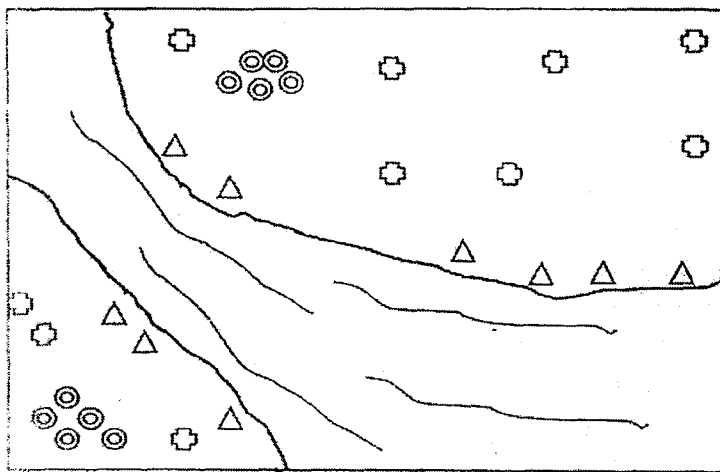


Reproductive system of a human

Based on the diagrams above, which part of the flower has a similar function as part X?

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

2. Study the growth of 3 plants X, Y and Z, near a river.



Key:

△ Plant X

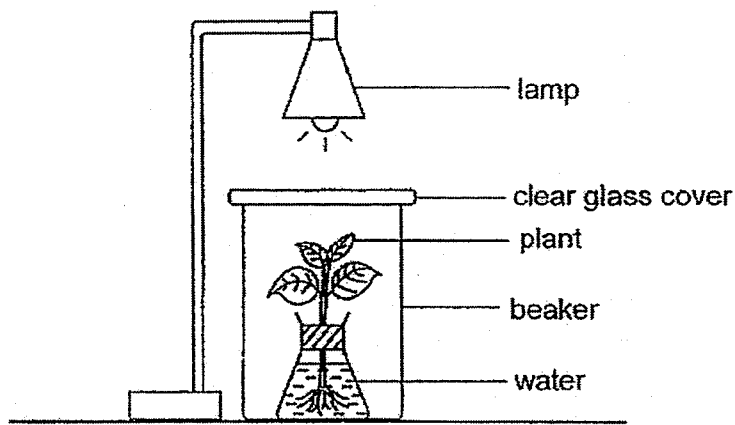
⊙ Plant Y

⊕ Plant Z

Which one of the following correctly shows the fruits of plants X, Y and Z respectively?

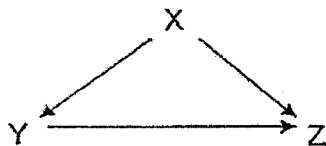
	Plant X	Plant Y	Plant Z
(1)			
(2)			
(3)			
(4)			

3. Study the set-up below.



After some time, the rate of photosynthesis of the plant slowed down. This was most likely caused by a lack of _____.

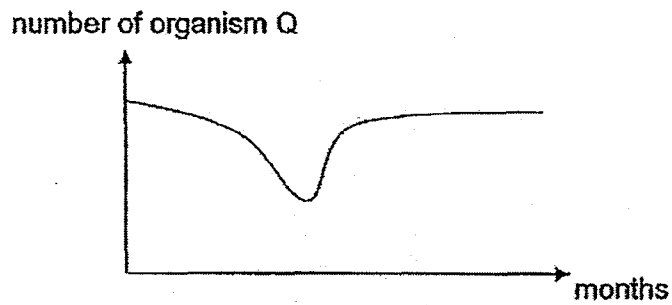
- A light
 - B oxygen
 - C carbon dioxide
- (1) C only
 - (2) A and B only
 - (3) A and C only
 - (4) B and C only
4. The letters below represent organisms in a community and the arrows show the direction of the transfer of energy.



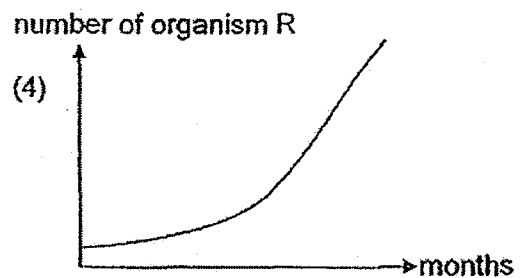
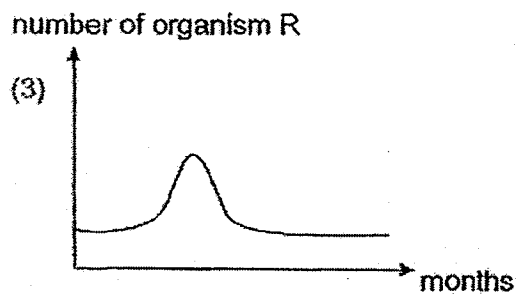
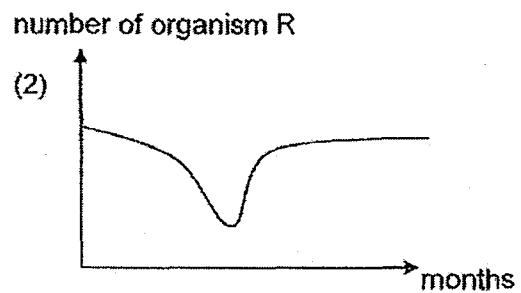
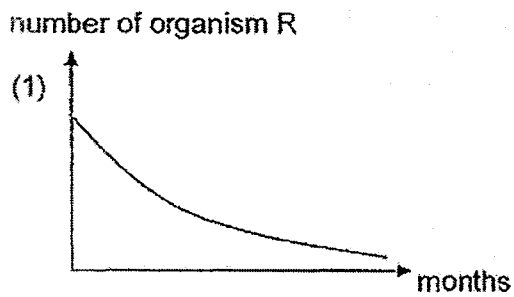
Which one of the following correctly represents X, Y and Z in the community?

	X	Y	Z
(1)	plants	decomposers	animals
(2)	decomposers	plants	animals
(3)	plants	animals	decomposers
(4)	animals	plants	decomposers

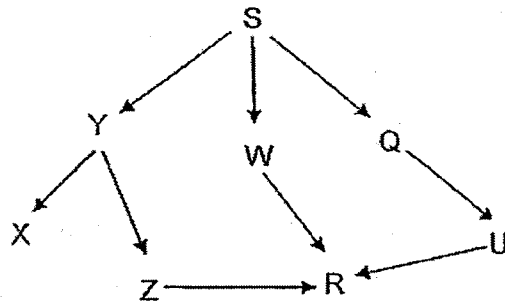
5. The graph below shows the number of migrating organism Q in a community within a year. Organism Q feeds on the seeds of organism R found in the same community.



Which one of the graphs shows the number of organism R during the same period of the year?



6. Study the food web below.



Based on the food web, how many organisms are both a prey and a predator?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

7. Fruit trees, vegetables and butterflies make up a community in a farm. The farmer discovered that the caterpillars were eating the vegetables and he decided to spray insecticide on the vegetables to get rid of the caterpillars.

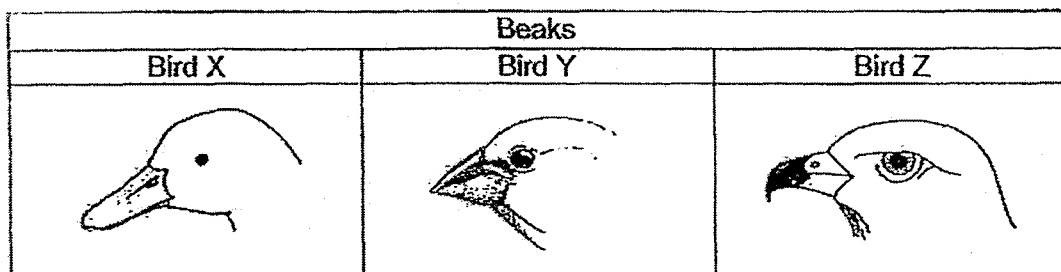
How would spraying of the insecticide affect the amount of vegetables and fruits produced in this farm over time?

	Number of fruits produced	Number of vegetables produced
(1)	increase	decrease
(2)	decrease	increase
(3)	decrease	decrease
(4)	increase	increase

8. Which one of the following describes a behavioural adaptation of the animal?

- (1) A bat has modified limbs for flight.
- (2) A penguin has a thick layer of blubber to keep itself warm.
- (3) A hummingbird has hollow bones which reduce its body mass.
- (4) A chameleon changes its colour to camouflage itself to blend into the surroundings.

9. The diagram below shows the beaks of three different birds.



Which one of the following correctly shows the bird and its diet?

	Bird X	Bird Y	Bird Z
(1)	seeds	fish	rats
(2)	fish	rats	seeds
(3)	fish	seeds	rats
(4)	rats	seeds	fish

10. Biotechnology has helped scientists to invent new methods of producing food of better quality. Which of the following are products of biotechnology?

- A Pest-resilient crops
- B Fermented food like yoghurt
- C Production of alcohol such as beer
- D Production of medicines to treat common illness

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

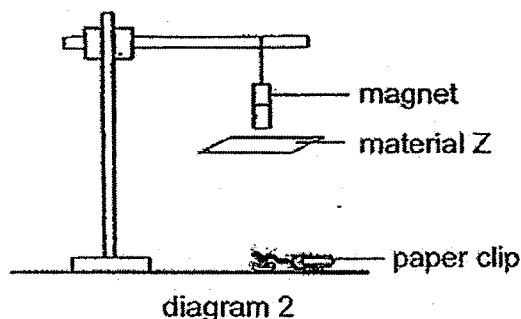
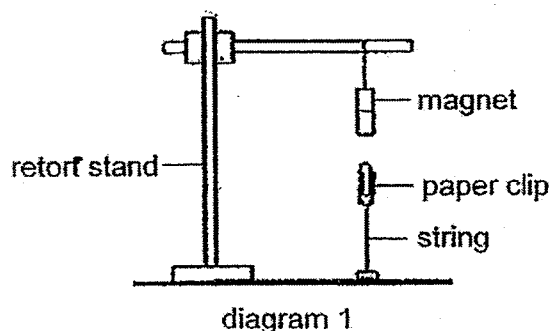
11. Rubbish in City X was collected and disposed of by burning, burying or dumping. The table shows the amount of rubbish collected and disposed in year 1990 and 2017.

Year	Rubbish (in million kg)	
	Collected	Disposed
1990	3000	2900
2017	4000	3000

Which is a possible reason to explain why less rubbish was disposed of in year 2017?

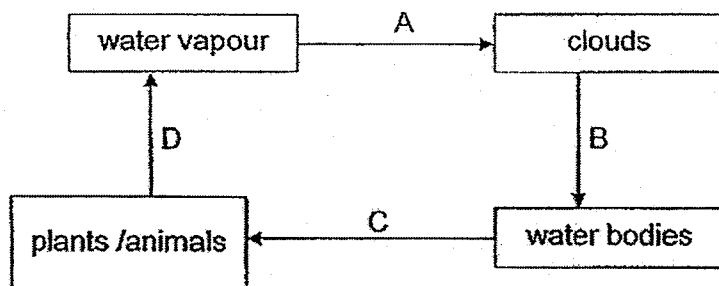
- (1) There are more incinerators built in year 2017 to burn the rubbish.
- (2) Population size of City X is lesser in year 1990 as compared to year 2017.
- (3) More recycling plants were built by year 2017 to recycle the rubbish.
- (4) More dumping grounds are available in year 1990 as compared to year 2017.

12. A paper clip, tied to a load on the table top by a string, was found to be suspended in the air as shown in diagram 1. However, when a thin piece of material Z was placed between the magnet and the paper clip, the paper clip dropped to the table top as shown in diagram 2.



Which of the following could material Z be made of?

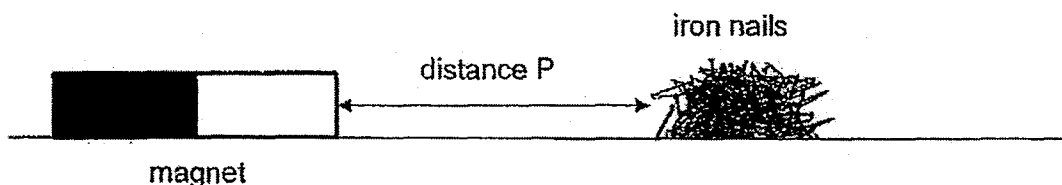
- A iron
 - B steel
 - C copper
 - D aluminium
- (1) A only
 (2) A and B only
 (3) B and C only
 (4) A, B, C and D
13. The diagram shows the water cycle. A, B, C and D represent the changes in the states of water.



Which one of the following about the change in the state of water in A, B, C and D is correct?

	A	B	C	D
(1)	no change	gas to liquid	no change	liquid to gas
(2)	no change	gas to liquid	liquid to gas	no change
(3)	gas to liquid	gas to liquid	no change	liquid to gas
(4)	gas to liquid	no change	no change	liquid to gas

14. An experiment is conducted with 4 different magnets A, B, C and D as shown below. Distance P is the greatest distance between the magnet and the iron nails for attraction to take place.



Magnets A, B, C and D are ranked according to their strength as shown below.

A B C D
 Strongest \longrightarrow Weakest

The table below shows the results of the experiment.

Magnet	Distance P (mm)	Number of iron nails that moved towards the magnet
A	50	4
B	X	4
C	25	4
D	Y	4

Which one of the following are possible distances X and Y for magnets B and D listed in the table above?

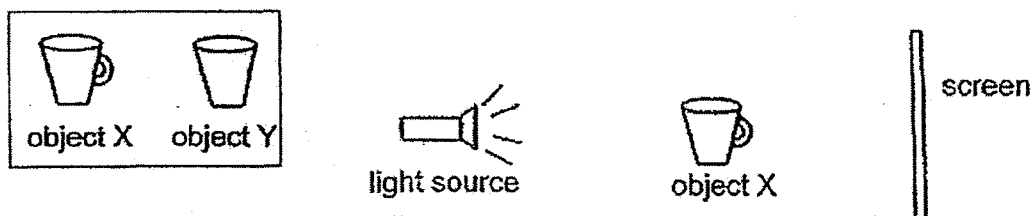
	X (mm)	Y (mm)
(1)	35	40
(2)	55	15
(3)	30	20
(4)	20	30

15. A force can change the _____ of a moving object.

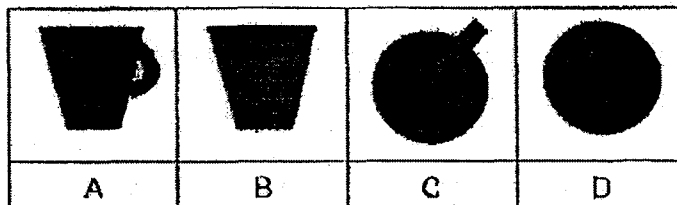
A mass
 B shape
 C speed
 D direction

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

16. Andy wanted to compare the shadows cast by objects X and Y. He placed object X between the light source and a screen and drew the various shadows that were formed as he rotated the object in different positions. He repeated the experiment with object Y.



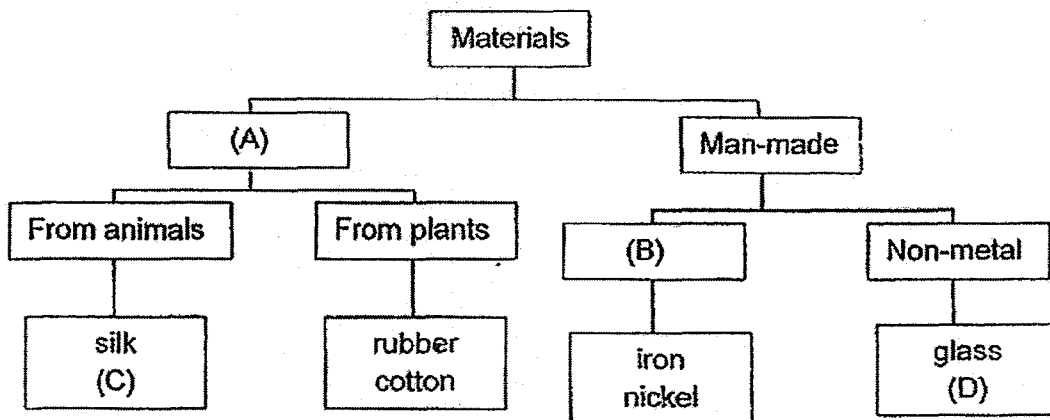
Some of the shadows formed by the two objects were shown below.



Which of these shadows could be seen for both objects X and Y?

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

17. Study the classification chart below carefully.



Which one of the following correctly represents A, B, C and D above?

	A	B	C	D
(1)	Living things	Metal	paper	copper
(2)	Natural	Matter	butter	plastic
(3)	Artificial	Matter	nylon	wood
(4)	Natural	Metal	leather	porcelain

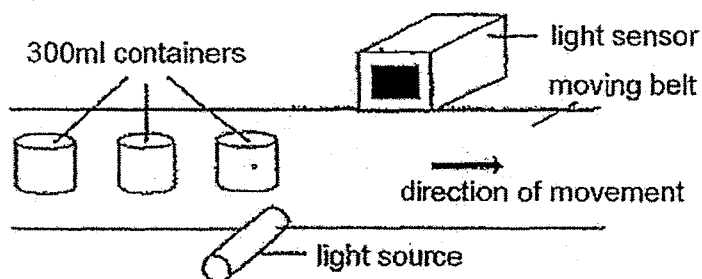
18. The table below shows the freezing and boiling points of 3 unknown substances R, S and T.

Substance	Freezing point (°C)	Boiling point (°C)
R	20	65
S	30	120
T	24	80

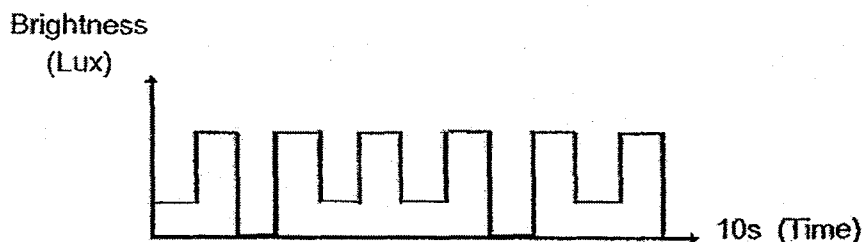
Which one of the following correctly shows the states of R, S and T at 110 °C?

	R	S	T
(1)	Solid	Liquid	Liquid
(2)	Gas	Liquid	Gas
(3)	Solid	Gas	Liquid
(4)	Gas	Gas	Gas

19. Samy set up a light sensor to count the number of 300 ml containers on a moving belt as shown in the diagram below. The containers are made of either opaque or translucent materials.



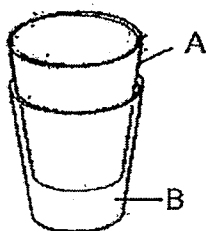
The belt moves at the same speed. As the containers pass between the light source and the sensor, they block light from reaching the sensor. The data recorded is shown in the graph below.



Based on the graph, how many containers made of translucent materials could be counted in 10 seconds?

- (1) 2
- (2) 4
- (3) 6
- (4) 12

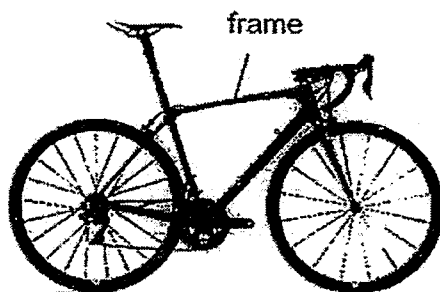
20. The diagram below shows two glasses, A and B, stacked tightly together.



Which one of the following methods can be used to separate the 2 glasses easily without breaking them?

- (1) Submerge both glasses in a basin of hot water.
- (2) Submerge both glasses in a basin of cold water.
- (3) Partially submerge B in a basin with some hot water and fill A with ice cubes.
- (4) Partially submerge B in a basin with some cold water and fill A with hot water.

21. The picture below shows a bicycle.



Four materials A, B, C and D are being considered for constructing the frame of the bicycle. Hassan conducts several tests on the four materials. The results of the tests are shown in the table below. A tick (✓) indicates that the material has the property.

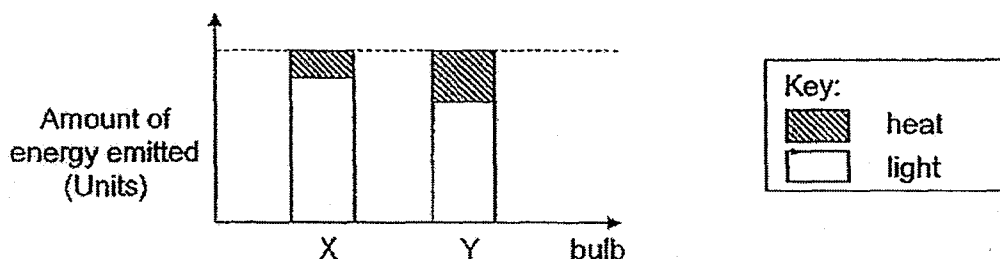
Properties				
Material	Can be bent easily	Can be scratched easily	Very strong	Waterproof
A	x	x	✓	✓
B	✓	✓	✓	x
C	x	✓	x	✓
D	✓	x	✓	✓

Which material is the most suitable for making the frame of the bicycle?

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

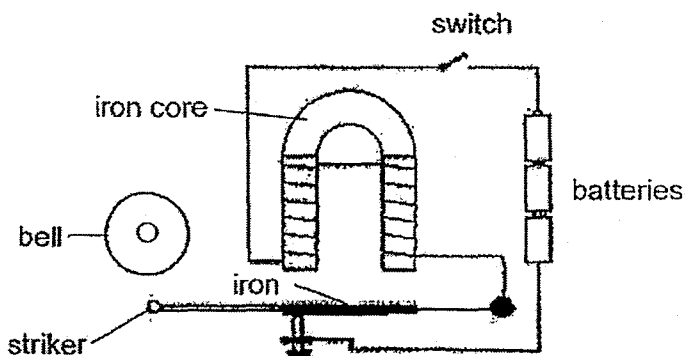
22. A test was conducted to compare the amount of light and heat emitted by two bulbs X and Y. Each bulb was tested in the same electric circuit to measure the amount of light and heat given out.

The graph below shows the amount of light and heat emitted by bulbs X and Y.



Based on the results above, which one of the following statements about bulb X and bulb Y is true?

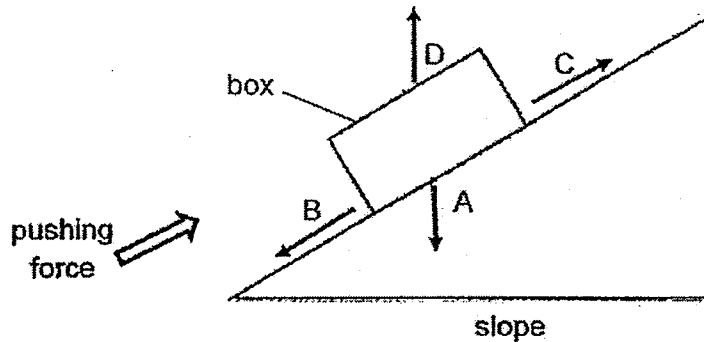
- (1) Bulb Y is able to last longer than Bulb X.
 - (2) Bulb X will fuse more easily than bulb Y.
 - (3) Bulb Y is hotter than Bulb X when the same amount of electricity is supplied.
 - (4) Bulb X is dimmer than Bulb Y when the same amount of electricity is supplied.
23. The diagram below shows the circuit of an electric bell.



Which one of the following shows in the correct order the energy changes that occurred when the circuit is closed?

- (1) chemical potential energy \rightarrow kinetic energy \rightarrow sound + heat energy
- (2) electrical energy \rightarrow kinetic energy \rightarrow magnetic energy \rightarrow sound energy
- (3) electrical energy \rightarrow magnetic energy \rightarrow kinetic energy \rightarrow sound energy
- (4) chemical potential energy \rightarrow electrical energy \rightarrow kinetic energy \rightarrow sound energy

24. The diagram below shows a box being pushed up a slope.



Which of the arrows A, B, C or D show the gravitational force and the frictional force acting on the box respectively?

	Gravitational Force	Frictional Force
(1)	A	C
(2)	A	B
(3)	C	B
(4)	D	A

25. Two identical beakers were filled with equal volume of liquid X and water respectively. The beakers were then left in the Sun for three hours. The diagrams below show the amount of liquids left in the beakers.

Start		After three hours	
liquid X	water	liquid X	water

Which one of the following statements explains the result?

- (1) Liquid X is lighter than water.
- (2) Liquid X evaporates faster than water.
- (3) Liquid X absorbs heat slower than water.
- (4) Liquid X can be compressed but not water.

26. Two identical syringes were completely filled with substances S and T respectively as shown in diagram 1 below. Diagram 2 shows the results when the plungers were pushed with a similar force.

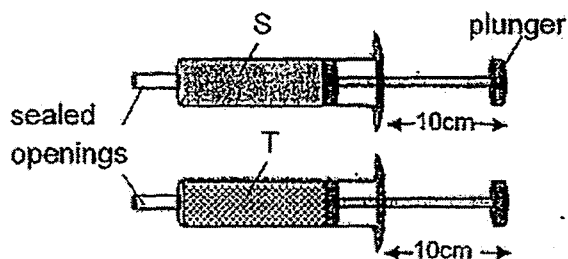


diagram 1

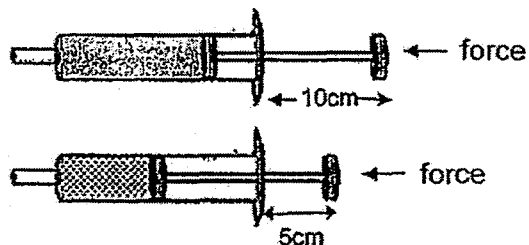
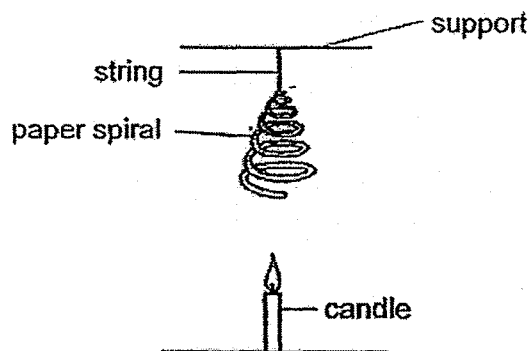


diagram 2

Based on the above observations, which one of the following statements about the property of substances S and T is True?

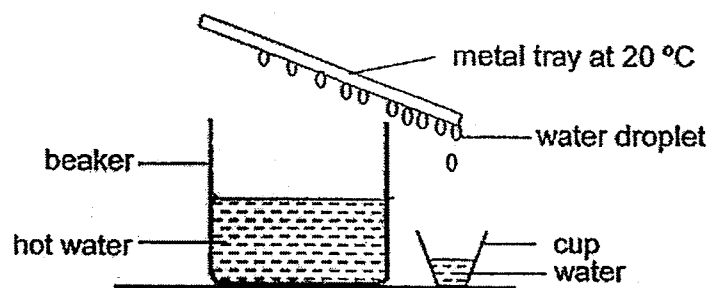
- (1) T occupies more space than S.
 - (2) T has a definite volume but not S.
 - (3) Both S and T have definite shapes.
 - (4) S cannot be compressed but T can.
27. Study the set-up below. The paper spiral started to spin when the candle was lit.



What is the energy that causes the paper spiral to spin?

- (1) The light energy from the flame.
- (2) The heat energy from the flame.
- (3) The kinetic energy of the hot air.
- (4) The chemical potential energy from the candle.

28. Study the set-up below.



Initially many water droplets were seen forming on the lower surface of the metal tray. However, there were fewer water droplets formed after some time. Which of the following could be the reasons?

- A The metal tray became cooler as it lost heat to the surroundings.
 - B There was less water vapour formed as the hot water became cooler.
 - C The metal tray became hotter as it gained heat from the warm water vapour.
 - D There was not enough surface area on the tray for condensation to take place.
- (1) A and D only
(2) B and C only
(3) A, B and C only
(4) A, B, C and D

Name : _____ ()

Class : Primary 6 _____

Primary 6
Preliminary Examination – 2017
SCIENCE

BOOKLET B

24 August 2017

Total Time for Booklets A and B: 1 hour 45 minutes

13 questions
44 marks

Do not open this booklet until you are told to do so.
Follow all instructions carefully.
Answer all questions.

This paper consists of 16 printed pages.

Booklet A	56
Booklet B	44
Total	100

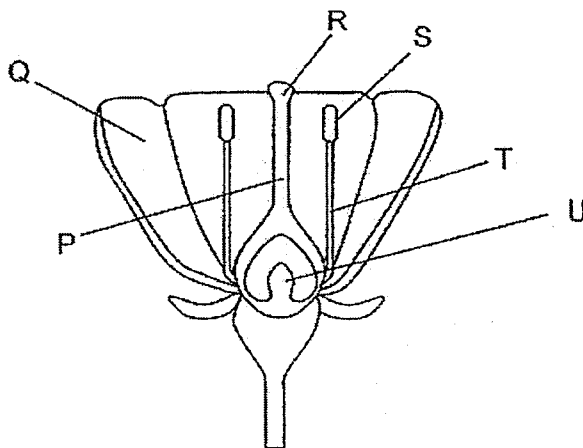
Parent's Signature

PART II

For questions 29 to 41, write your answers in this booklet.

The number of marks available is shown in the brackets [] at the end of each question or part question. **(44 marks)**

29. Kenny observed the parts of a flower and labelled them using the letters P, Q, R, S, T and U as shown below.



- (a) Write down the letters which represent the female parts of the flower. [1]

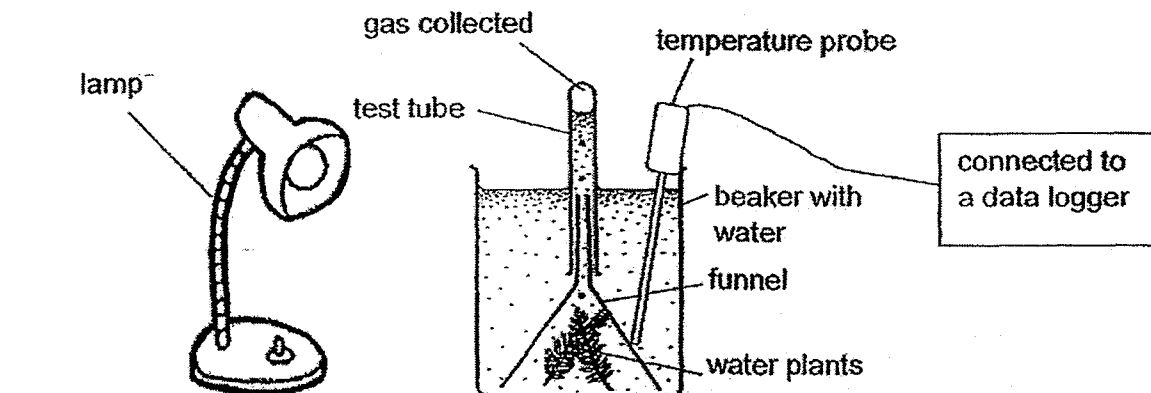
- (b) Kenny noticed that part Q was large and brightly coloured. Explain clearly how this characteristic helps the plant in its reproduction. [1]

The picture below shows the fruits of a plant. Kenny observed that the fruits are small and were green in colour for a few days before turning bright red and juicy,

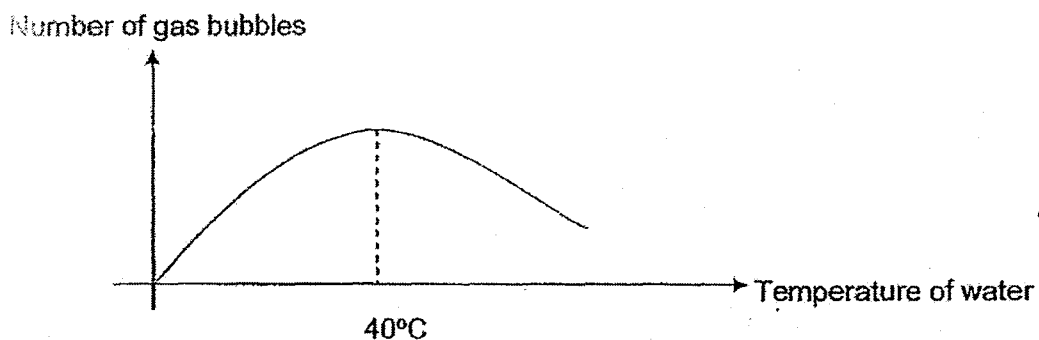


- (c) Explain why the fruit remains green for a few days before turning bright red. [1]

30. Liping conducted an experiment using the set-up below.



The temperature probe recorded the temperature of the water in the beaker over a period of time. Liping counted the number of gas bubbles given out by the water plants at the same time. The graph below shows the results of her experiment.



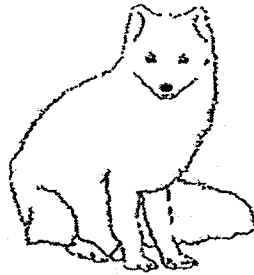
- (a) Based on Liping's results, what is the relationship between the temperature of water and the amount of gas collected? [1]

- (b) Give a reason why the temperature of water rises as the time passes. [1]

- (c) Identify the gas that is collected in the test tube. [1]

- (d) It was reported that close to a thousand fish at Bishan - Ang Mo Kio Park died during the hotter months of the year. Based on the experiment above, give a reason why the fish in the park died. [2]

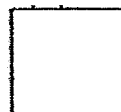
31. The diagram below shows an arctic fox which lives in a very cold environment. Arctic fox's fur changes colour with the seasons of the year. It has white fur during winter and brown fur during summer. The arctic fox also has a pair of very small ears.



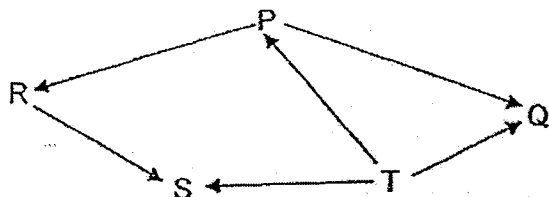
arctic fox

- (a) Explain how the ears of the arctic fox are adapted to the environment it lives in. [1]

- (b) Explain why it is an important adaptation for the arctic fox to be able to change the colour of its fur during the different seasons. [1]



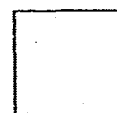
32. The food web below shows the relationships between organisms P, Q, R, S and T.



- (a) Based on the food web, which organism(s) is/are food producers? Explain your answer. [1]

- (b) Construct a food chain with four types of organisms from the food web shown above. [1]

- (c) Some organism X are introduced to the habitat and they prey on organisms R and S. How would the population of organism P be affected after sometime? Explain your answer. [1]



33. A solar panel converts light energy into electrical energy. In order to harness the solar energy, some scientists decided to place solar panels above the water in the reservoirs in Singapore.



The largest floating solar test bed in the world at the Tengeh Reservoir, Singapore

- (a) State one advantage and one disadvantage of placing the solar panels on the reservoirs in Singapore. [2]

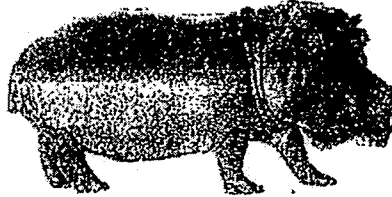
Advantage :

Disadvantage:

- (b) How would harnessing solar energy from the sun help to preventing global warming? [1]



34. Animal W lives in areas with rivers and lakes. It spends up to 16 hours a day submerged in water to keep their massive bodies cool in the hot environment. It needs to keep its skin moist all the time.



animal W

- (a) Animal W tend to search for food at night. Give a reason why they do that.

[1]

The diagram below shows the teeth of animal W.

short and blunt
teeth



big, blunt and strong
teeth

- (b) Based on the diagram, is animal W a plant-eater or an animal-eater? Give a reason for your answer.

[1]

- (c) Animal W's eyes and nostrils are located near the top of its head. Why is this an advantage for animal W when it stays in the water for a long time?

[1]



Oxpecker birds like to feed on the small insects and parasites found on the skin of animal W. These birds are often seen pecking on animal W's body.



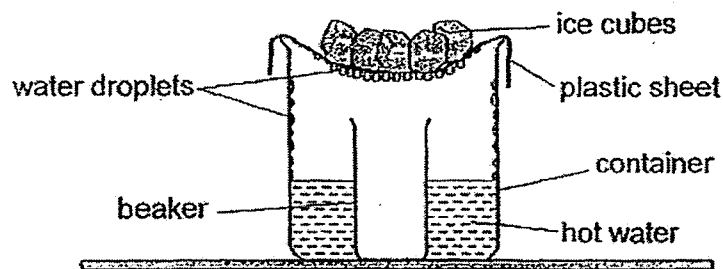
(d) How does this relationship benefit the two animals? [2]

Benefit for animal W	

Benefit for Oxpecker birds	



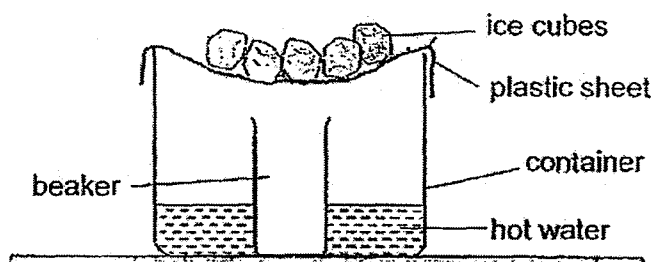
35. Sally used the set-up below to demonstrate the water cycle.



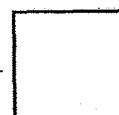
(a) What is the purpose of using hot water in the container? [1]

(b) Explain how water can be collected in the beaker. [2]

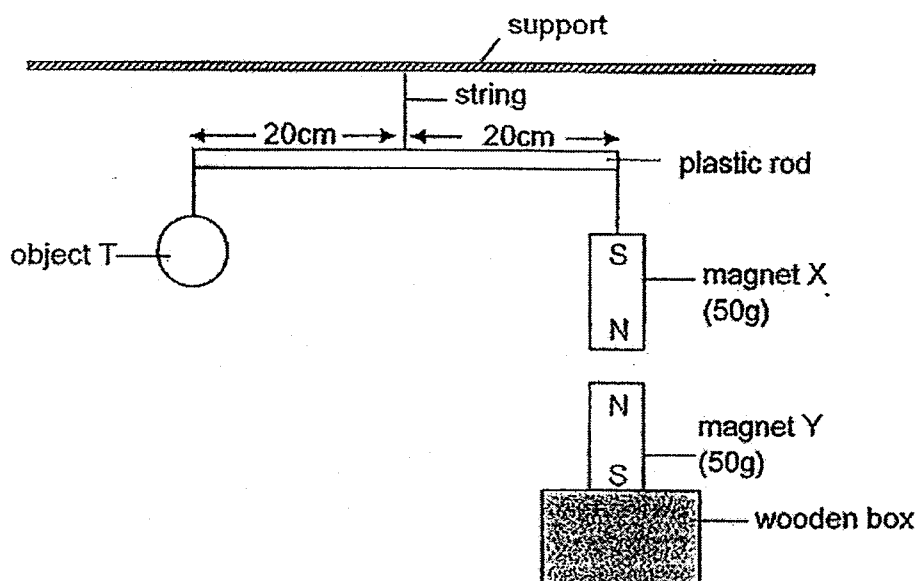
Sally used a bigger container in her second set-up as shown below to compare the amount of water collected in the beaker.



(c) She observed that more water can be collect in the beaker. Explain why. [1]



36. Object T and magnet X are balanced on a rod as shown in the diagram. Magnet Y is resting on a wooden box.

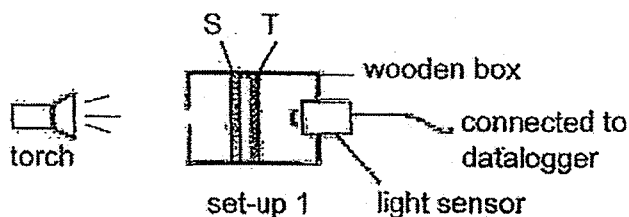


- (a) Is object T less than, equal to or greater than 50g? [1]

- (b) Will object T and magnet X still be balanced if magnet Y is replaced by a copper bar of the same size? Explain your answer. [2]



37. Wei Ming had three materials S, T and U of the same thickness. He placed materials S and T in the set-up shown below and recorded the amount of light detected by the light sensor.

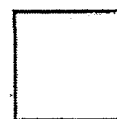


He repeated the experiment with different pairs of materials and recorded the amount of light detected by the light sensor in the table below.

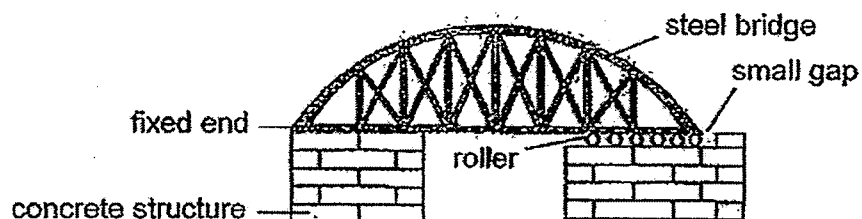
Set-up	Materials placed in the box	Amount of light detected (units)
1	S and T	200
2	T and U	110
3	S and U	50

- (a) Without replacing any parts of the set-ups, suggest one way to increase the amount of light detected by the light sensor [1]

- (b) Wei Ming wanted to use one of the materials to make the rooftop window of his house so that he need not switch on the lights during the day. Which material, S, T or U should he use? Explain your answer. [2]



38. The diagram below shows a steel bridge. One end of the bridge is fixed securely to the concrete structure while the other end is resting on rollers.



- (a) Why does one end of the bridge rest on rollers? Give two reasons. [2]

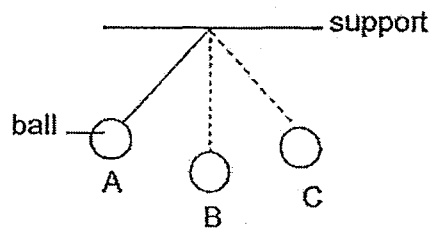
i) _____

ii) _____

- (b) Will the small gap in the structure above become smaller, bigger or remain the same at night? Explain your answer. [2]



39. Siva hung a metal ball to a support as shown in the diagram below. When the metal ball was released from point A, it swung to point B and then to point C.



- (a) When Siva released the ball at a position higher than point A, he observed that the ball swung to a position higher than point C. Explain his observation.

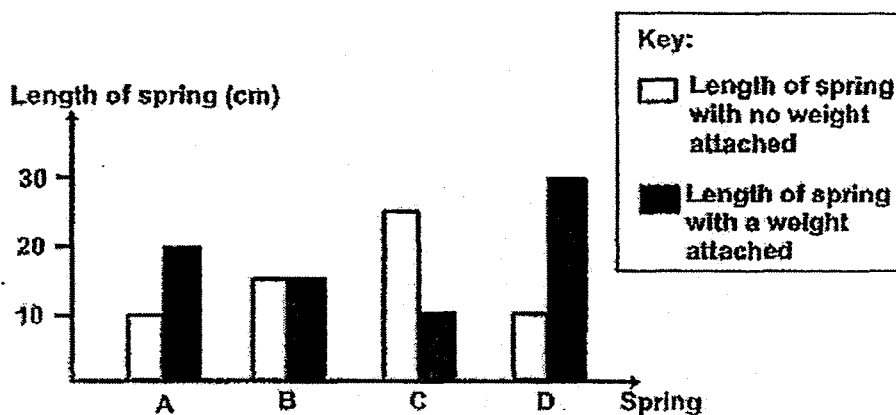
[1]

- (b) He also observed that the metal ball swung to and fro a few times and eventually came to a stop. Why did the metal ball eventually come to a stop?

[1]



40. Springs A, B, C and D are of different lengths. The graph below shows how the length of each spring in different devices changed when different weights were attached to the springs.



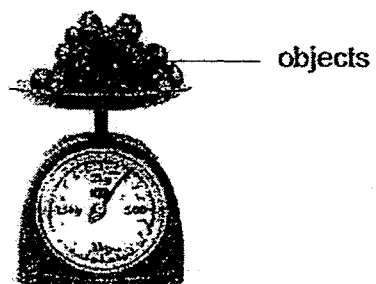
- (a) Based on information from the graph, what can you observe about Spring B? [1]

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

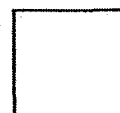
- (c) Based on the graph above, what is the difference between spring A and spring C? [1]



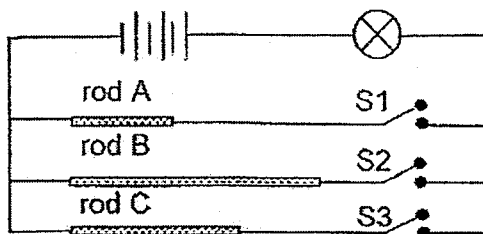
The diagram below shows a weighing scale used to measure the weight of objects.



- (d) Based on the graph, which spring A, B, C or D shows the spring that is used in the weighing scale? Explain your answer. [1]



41. Mohan set up the circuit as shown in the diagram below. Rods A, B and C are made of the same material. He closed one switch at a time and then observed the brightness of the bulb.



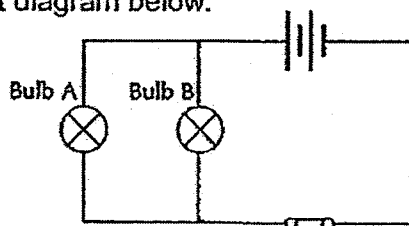
He recorded his observations in the table below.

S1	S2	S3	Brightness of bulb
Closed	Open	Open	very bright
Open	Closed	Open	dim
Open	Open	Closed	Bright

- (a) Based on the experiment above, state one property of the rod. [1]

- (b) What is the relationship between the length of the rod and the brightness of the bulb? [1]

- (c) Study the circuit diagram below.



- Will bulb A remain lighted when bulb B is removed? Explain your answer. [1]



ANSWER SHEET

EXAM PAPER 2017 (P6)

SCHOOL : CHIJ

SUBJECT : SCIENCE

TERM : PRELIM

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

29)a)R, U, P

b)Part Q is large and brightly coloured so as to attract pollinators to visit the flower and pollinate it.

c)The fruits/seeds are not ready for dispersal and will not attract animals to eat them yet. Thus, it will remain green to blend in with the plants, so animals will not eat them.

30)a)At first, the number of gas bubbles increased as the temperature of water increases. However, after 40°C, the number of gas bubbles decreased as the temperature of water increases.

b)The heat from the lamp had been transferred to the water.

c)Oxygen.

30)d)The fish in the park died as the water plants in the water produced lesser oxygen bubbles during the hotter months of the year because the temperature of water is higher. Thus, the fish would die due to the lack of oxygen.

31)a)Has lesser surface area in contact with the environment.

b)The artic fox would be able to camouflage with its surroundings during the different seasons and not get spotted by it's predator easily.

32)a)Organism T. It is a plant and produces food for organisms P, Q and S does not eat other animals. Instead, it makes food with sunlight, thus, it is a food producer.

b) $T \rightarrow P \rightarrow R \rightarrow S$

c)The population of organism P will increase as there are lesser organism Rs that feed on them. Thus, P will have lesser predators that prey on them and the population of P will increase.

33)a)Advantage: It helps to conserve space.

Disadvantage: Aquatic plants under the solar panels will not be able to receive light and photosynthesize, causing the amount of dissolved oxygen in the water to be lesser.

b)There will be lesser fossil fuels burnt, reducing the amount of carbon dioxide produced that contributes.

34)a)It is cooler at night so animal W's skin can keep moist while it searches for food at night.

b)Animal W is a plant eater as it has blunt teeth to grind the plants that it has eaten.

c)Animal W can submerge its whole body into the water, leaving its eyes and nostrils above the water as the eyes can watch out for predators hunting it and animals W can also breath through the nostrils.

d)Small insects and parasites found on its skin can be cleared away.

They will be able to get food by feeding on the small insects and parasites.

35)a)The hot water would be able to evaporate into water vapour at a faster rate.

b)The hot water will gain heat and evaporate into water vapour. Upon touching the cooler surface of the plastic sheet, the warmer water vapour would lose heat and condense into water droplets. The water droplets will drip into the beaker.

c)The water had more exposed surface area and would evaporate into water droplets at a faster rate.

36)a)Less than 50g.

b)No. Copper is a non-magnetic material, and cannot be a magnet, thus it will not repel and push magnet X upwards.

37)a)Move the torch closer to the set-ups.

b)Material T. T allowed the most amount of light to pass through compared to S and U. Therefore, it is the most suitable to make the roof top window of his house and brighten up the room.

38)a)i)To act as a lubricant to reduce friction between bridge and concrete structure, so that it can expand and contract easily.

ii)To prevent wear and tear of the concrete structure.

39)a)The ball possessed more gravitational potential energy that would be converted to more kinetic energy so it will be able to swing to a higher position than point C.

b)All the kinetic energy had been converted to heat energy or gravitational potential energy so it would eventually come to a stop.

40)a)Spring B doesn't extend.

b)It did not stretch when a weight was attached to it and its length remained the same.

c)A's length increased when a weight was hung onto it while C's length decreased when a weight was attached to it.

40)d)Spring C. The spring in the weighing scale would decrease in length when an object was present. Therefore, spring C is the spring used in weighing scales.

41)a)It is a good conductor of electricity.

b)The longer the length of the rod, the dimmer the bulb will be.

c)Yes. The circuit is arranged in parallel and if B is removed, there would still be a path of electricity and A would remain lighted.