

MID-YEAR EXAMINATION

SCIENCE (BOOKLET A)

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

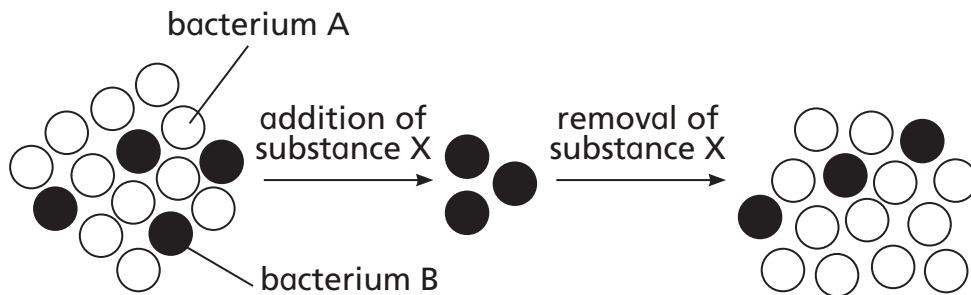
INSTRUCTIONS TO CANDIDATES

- Follow ALL instructions carefully.
- Answer ALL questions.

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).

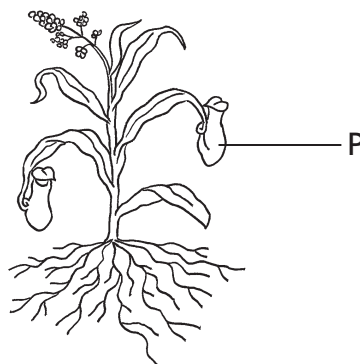
[56 marks]

1. Bacterium A and bacterium B are the same type of bacteria that have different resistance to substance X. A scientist adds substance X to eleven bacterium A and four bacterium B. After some time, she removes substance X from the bacteria. The diagram shows her observations.



Which statement is correct?

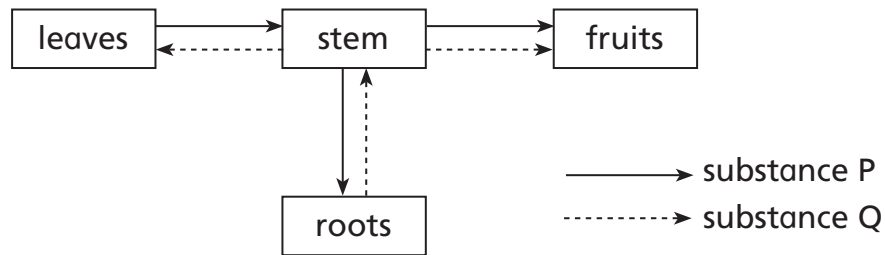
- (1) Substance X can kill all of bacteria A and B.
 - (2) Bacterium B is not affected by substance X at all.
 - (3) Bacterium B can reproduce to produce bacterium A.
 - (4) Bacterium A is more resistance to substance X than bacterium B.
2. The diagram shows a special plant. Part P of the plant produces a liquid that digests dead animals and absorbs the digested substance.



Which part of the human digestive system has similar functions to part P of the special plant?

- (1) Mouth
- (2) Stomach
- (3) Small intestine
- (4) Large intestine

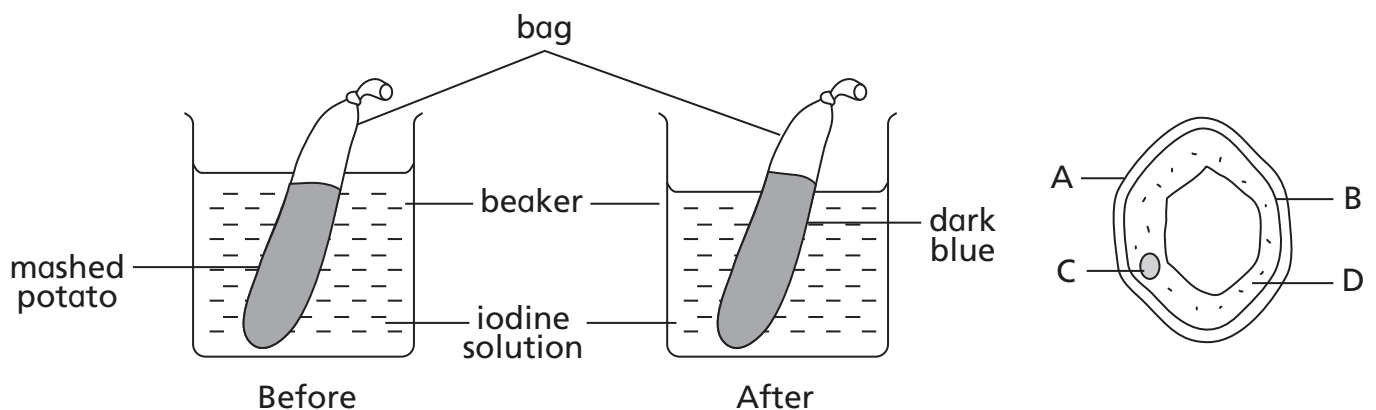
3. The diagram shows the transport of substances, P and Q, in a plant.



What are substances P and Q?

	Substance P	Substance Q
(1)	Sugar	Water
(2)	Water	Sugar
(3)	Carbon dioxide	Oxygen
(4)	Oxygen	Carbon dioxide

4. Marvin added some mashed potato and iodine solution into a special type of bag. He placed the bag into a beaker of iodine solution as shown. When food is present, the yellow iodine solution will turn dark blue.

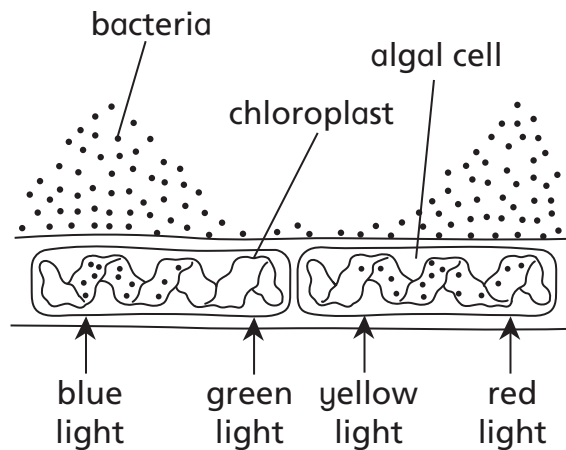


At the end of the experiment, he observed the iodine solution in the bag increased in volume. The iodine solution in the beaker remained yellow but decreased in volume.

Which part of the plant cell functions in a similar way to the bag in the experiment?

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

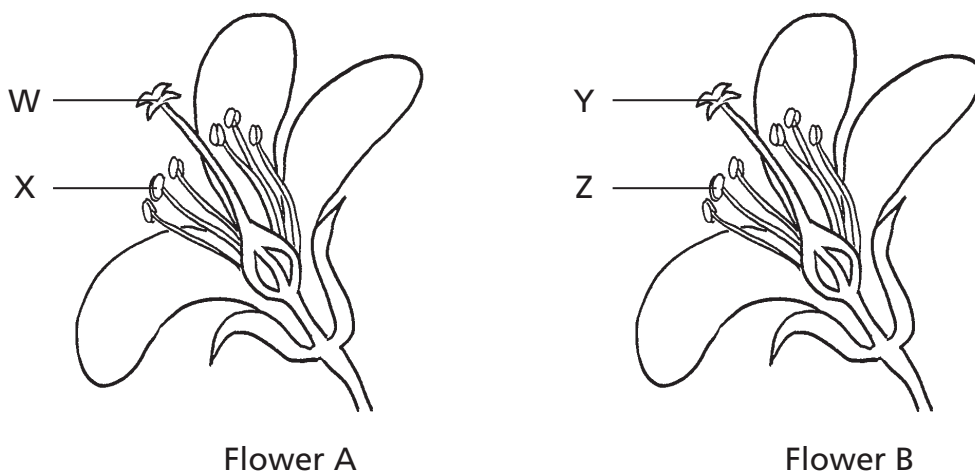
5. A scientist places some algal cells and bacteria in water and shines different coloured lights on the algal cells. She observes the amounts of bacteria that move towards different parts of the algal cells as shown.



What can be concluded from the diagram?

- (1) Blue and red lights cause the fastest production of oxygen.
- (2) Blue and red lights cause the fastest production of carbon dioxide.
- (3) Green and yellow lights cause the fastest production of oxygen.
- (4) Green and yellow lights cause the fastest production of carbon dioxide.

6. The diagram shows two flowers.



Flower A

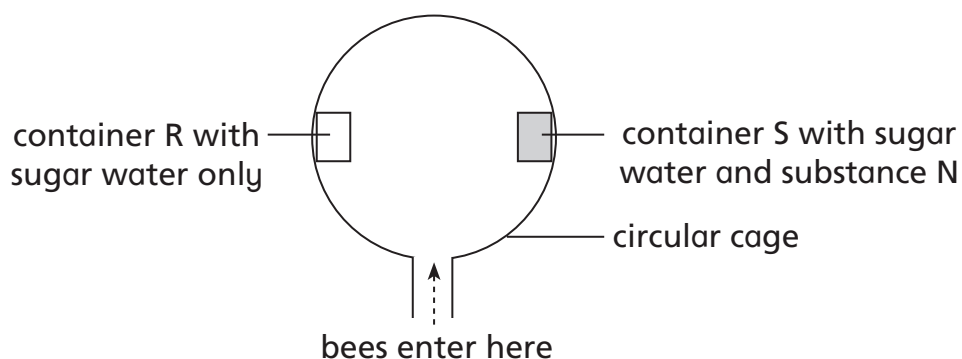
Flower B

Which transfer of pollen grains will cause flower B to develop seeds?

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

7. For the past 10 years, the number of bees has decreased. Some people suspect that substance N that is used to kill fungi causes the number of bees to decrease.

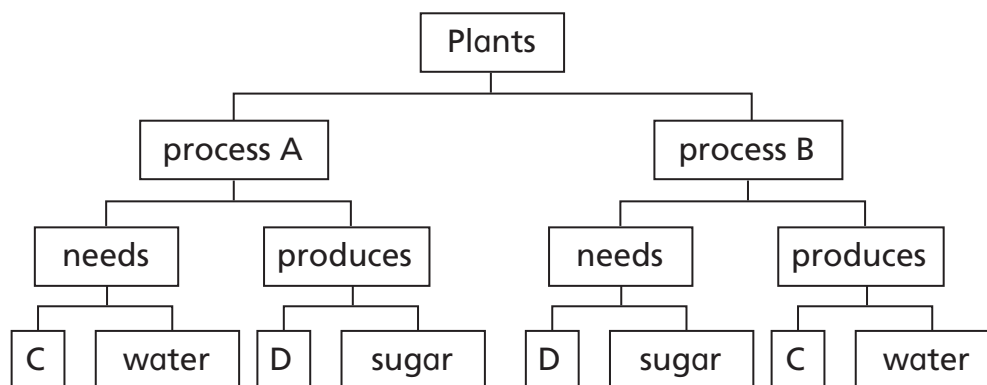
Scientists carry out many experiments on the bees. In one of the experiments shown below, they find that bees prefer sugar water mixed with substance N.



Which statement is correct?

- (1) The bees visit container R more times than they visit container S.
- (2) Substance N is the only reason why the number of bees decreases.
- (3) The experiment aims to find out whether substance N is harmful to bees.
- (4) For a fair experiment, containers, R and S, are placed at equal distance from where the bees enter.

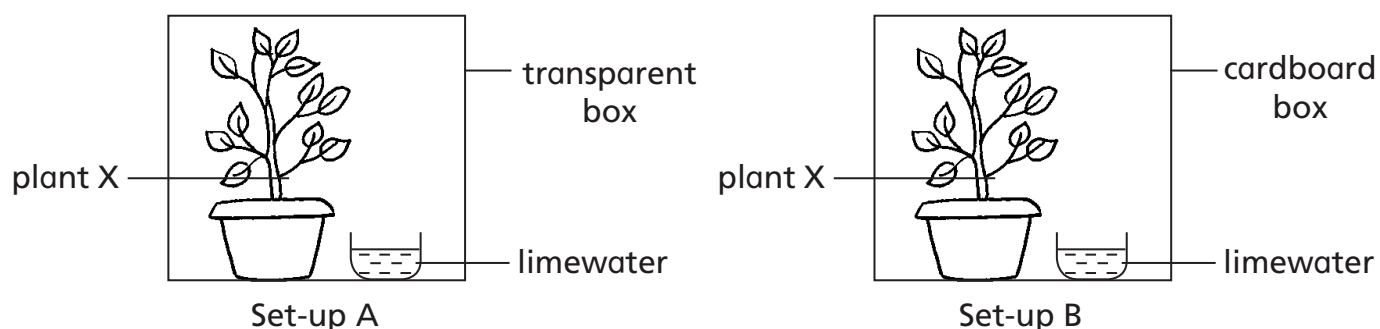
8. Study the following chart.



What do the letters represent?

	A	B	C	D
(1)	respiration	photosynthesis	oxygen	carbon dioxide
(2)	respiration	photosynthesis	carbon dioxide	oxygen
(3)	photosynthesis	respiration	oxygen	carbon dioxide
(4)	photosynthesis	respiration	carbon dioxide	oxygen

9. Yan Ming placed set-ups, A and B, near a window. After two weeks, she checked on the limewater in the set-ups. Limewater is a clear solution that produces white solid particles when the amount of carbon dioxide in the air increases.



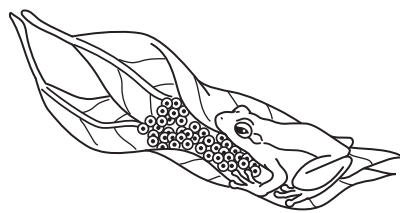
Which would be her observation and the explanation for her observation?

	Observation	Explanation
(1)	Limewater in set-up A remained clear.	Carbon dioxide was taken in by the plant in set-up A during photosynthesis.
(2)	White solid particles appear in limewater in set-up A.	Carbon dioxide was taken in by the plant in set-up A during photosynthesis.
(3)	Limewater in set-up B remained clear.	Oxygen was taken in by the plant in set-up B during photosynthesis.
(4)	White solid particles appear in limewater in set-up B.	Oxygen was taken in by the plant in set-up B during photosynthesis.

12. The larva of butterfly W eats only the poisonous leaves of plant X. The poison does not affect the larva but is harmful to other organisms. What can we infer from the above information?
- (1) Energy is transferred from W to X.
 - (2) The poison in the larva deters predators.
 - (3) The larva contains poison when it hatches out of an egg.
 - (4) The adult butterfly W that grows from the pupal stage will lose its poison.
13. Mangrove forests, found along the shores, are warm and wet. Mangrove plants grow on clayey soil which has low oxygen content. During high tide, small crabs climb up the mangrove plants to avoid fish predators. Birds feed on worms that hide deep in the soil. Which are **not** adaptations of plants and animals mentioned in the above information?
- (1) Gill chamber
 - (2) Thick layer of fur
 - (3) Long curved beak
 - (4) Protruding breathing roots
14. Fossil fuels and batteries are two sources of energy. How are they different?

	Fossil fuels	Batteries
(1)	Possess heat energy	Possess electrical energy
(2)	Renewable	Non-renewable
(3)	Do not cause acid rain	Cause acid rain
(4)	Cause global warming	Cause land and water pollution

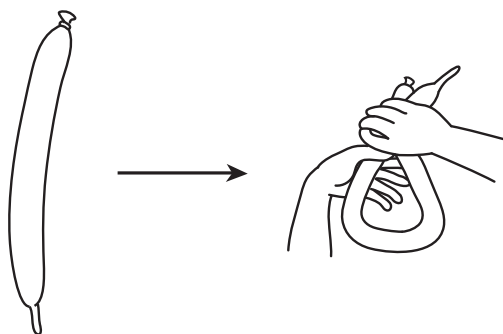
15. The diagram shows a tree frog wrapping its eggs with some leaves.



Which property of the leaves protects the frog's eggs from predators?

- (1) They are strong.
- (2) They are flexible.
- (3) They are waterproof.
- (4) They do not allow light to pass through.

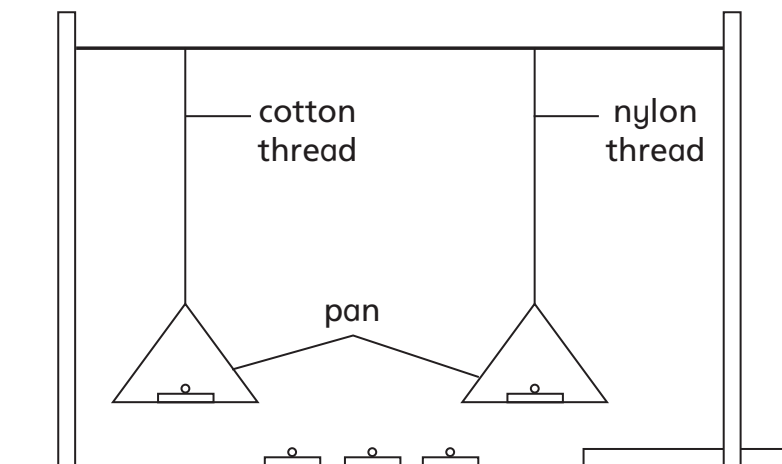
16. Mei Ling twists a balloon as shown.



Which **cannot** be concluded from Mei Ling's action?

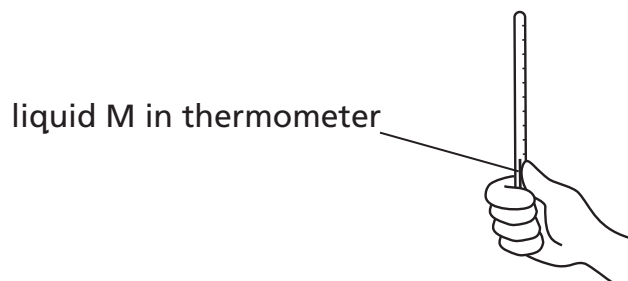
- (1) Air does not have a fixed shape.
- (2) Air does not have a definite volume.
- (3) The balloon is made of a flexible material.
- (4) A force can change the shape of an object.

17. Ismail sets up the following experiment using the same thickness and length of threads. His hypothesis is that nylon is stronger than cotton.



Which observation would prove his hypothesis?

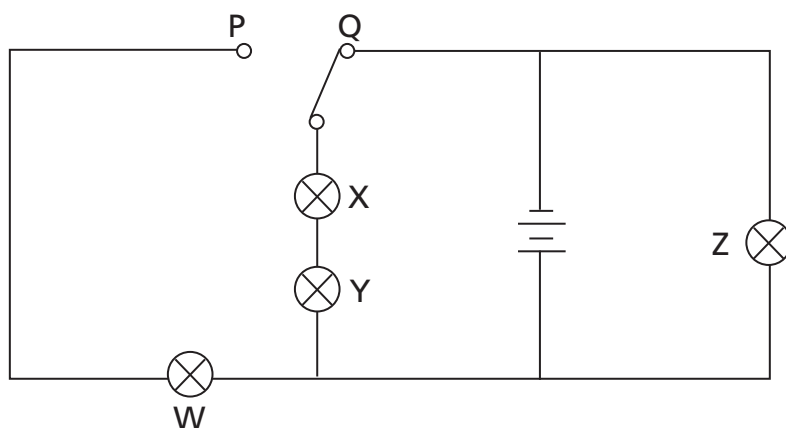
- (1) The cotton thread stretches more than the nylon thread for the same load.
 - (2) The nylon thread stretches more than the cotton thread for the same load.
 - (3) The cotton thread snaps under a greater load than the nylon thread.
 - (4) The nylon thread snaps under a greater load than the cotton thread.
18. When Hassan holds the bulb of a thermometer, he observes that the level of liquid M rises up the stem of the thermometer. Why?



- (1) Liquid M in the bulb gains heat from the hand and expands.
- (2) Liquid M in the bulb loses heat to the hand and expands.
- (3) Liquid M in the bulb loses heat to the hand and contracts.
- (4) Liquid M in the bulb gains heat from the hand and contracts.

19. A packet of substance P is used to keep a piece of cake in a box cool. Which would **not** happen as the temperature in the box increases?
- (1) The temperature of solid substance P increases.
 - (2) During melting, substance P absorbs heat from the air.
 - (3) The percentage of liquid substance P decreases during melting.
 - (4) During melting, the temperature of substance P remains constant.

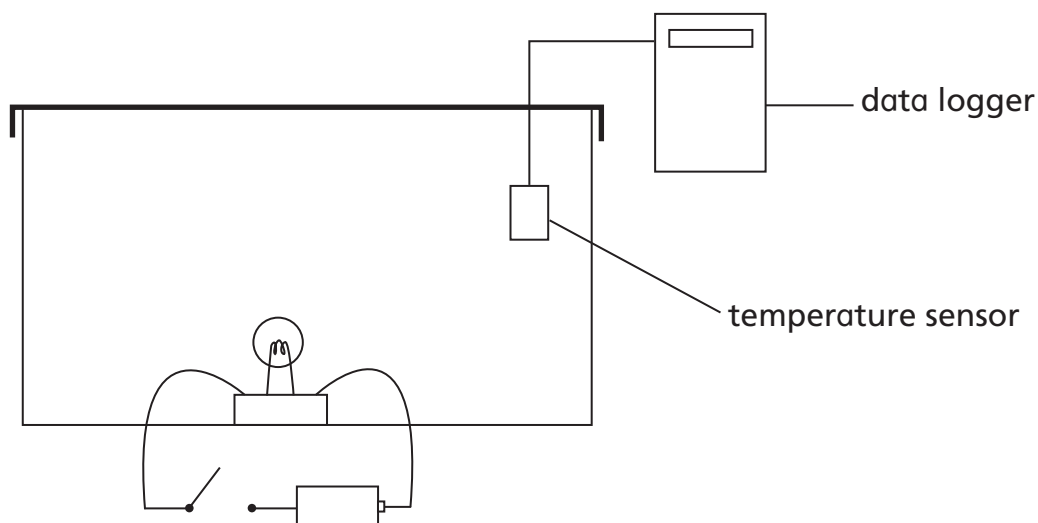
20. Jovi sets up the following circuit.



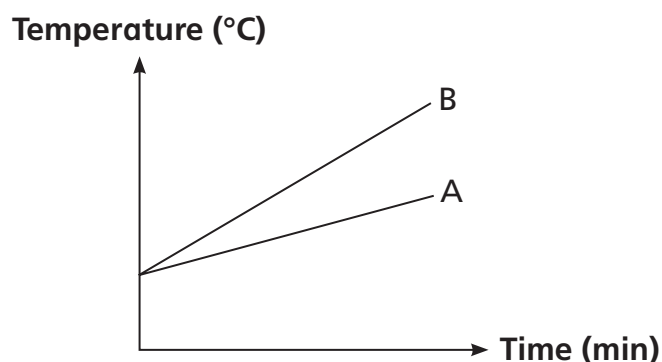
Which statement is correct?

- (1) When switch is at P, only bulb Z lights up.
- (2) When switch is at Q, only bulb Z lights up.
- (3) When switch is at Q, all the bulbs light up.
- (4) When switch is at P, none of the bulbs light up.

21. Keith places a bulb in a cardboard box, closes the switch and measures the temperature.



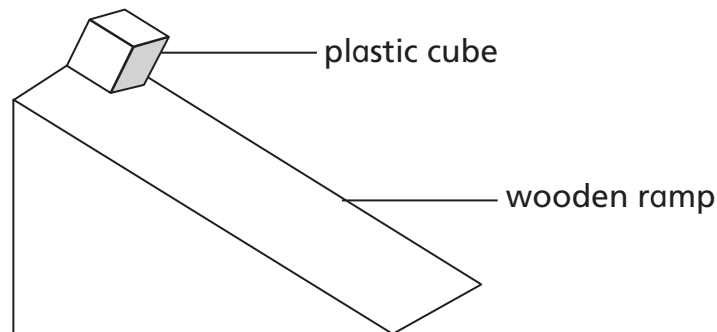
He obtains graph A as shown below. He then makes one change to the set-up and repeats the experiment. He obtains graph B as shown.



Which change does he make to obtain graph B?

- (1) Remove the lid of the box.
- (2) Replace the cardboard box with a metal box.
- (3) Add a battery in series with the first battery.
- (4) Add a second bulb in series with the first bulb.

22. The time taken for a cube to reach the bottom of the ramp was recorded in the table below.



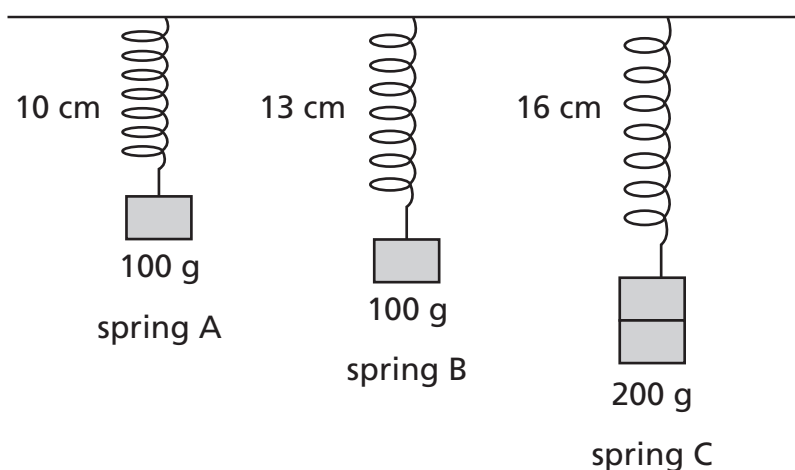
The experiment was repeated using powder T spread on the surface of the wooden surface.

	Time taken (s)
Without powder T	30
With powder T	18

What effect does powder T have?

- (1) It decreased the weight of the cube.
- (2) It increased the friction between the cube and the ramp.
- (3) It decreased the amount of kinetic energy that was converted to heat.
- (4) It decreased the amount of gravitational potential energy that was converted to kinetic energy.

23. Kaixin hangs different loads on two different springs, A and B. The original length of spring A is 8 cm.

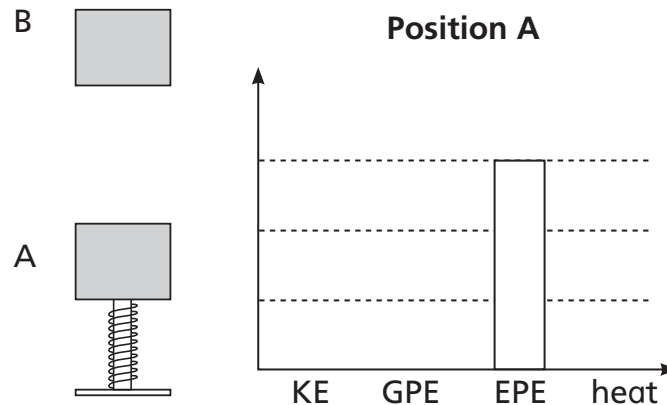


Which of the following statements is/are correct?

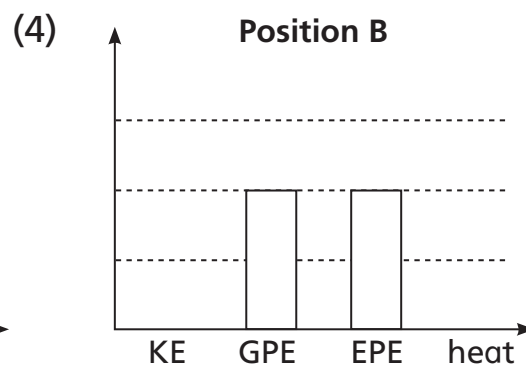
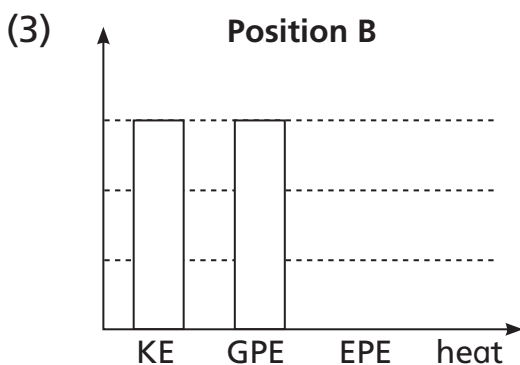
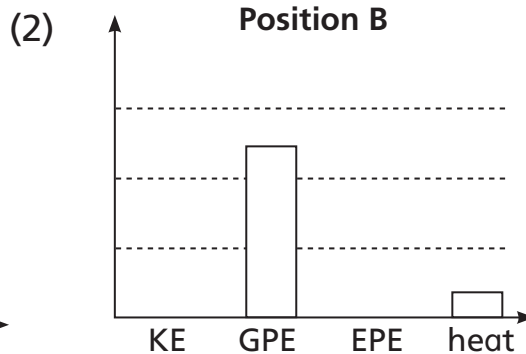
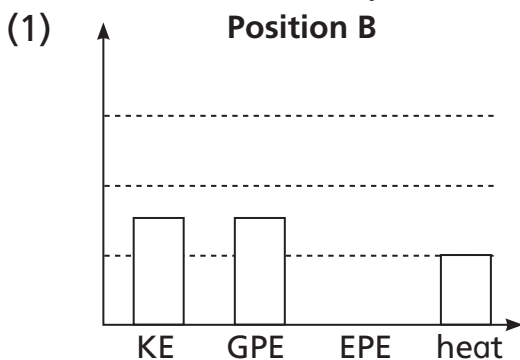
- A Spring A is harder to stretch than spring B.
- B Spring A has a greater original length than spring B.
- C Spring A exerts a greater elastic spring force than spring B when 100 g of load is hung on them.

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

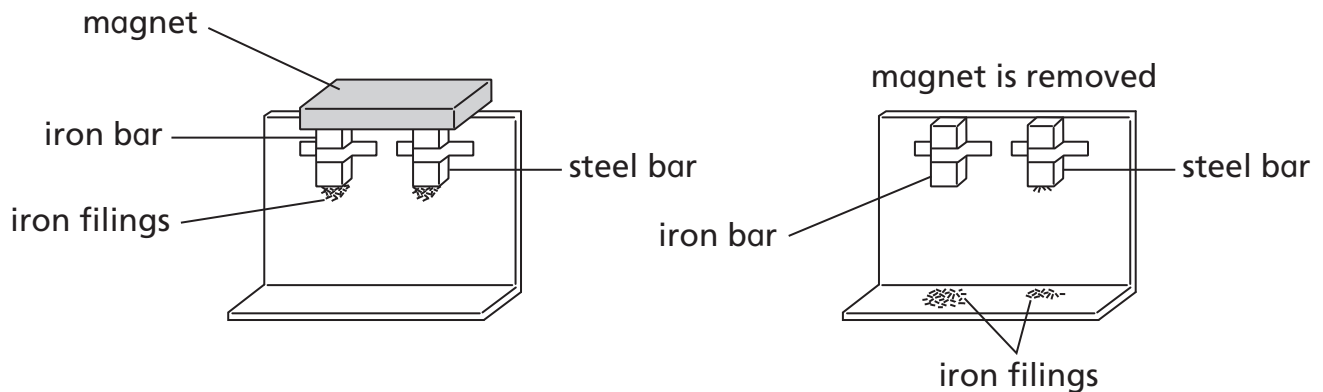
24. A block is placed on a compressed spring at position A. When the spring is released, the block moves to the highest position, B. The diagram shows the amounts of kinetic energy (KE), gravitational potential energy (GPE), elastic potential energy (EPE) and heat produced at positions, A and B, of the block.



Which graph would correctly describe the different types of energy when the block is at position B?



25. Delun carries out the following experiment on an iron bar and a steel bar.



	Mass of iron filings attracted to iron bar (g)	Mass of iron filings attracted to steel bar (g)
Before a magnet is placed on the bars	0	0
When a magnet is placed on the bars	10	5
After the magnet is removed	0	2

Based on Delun's results, which statement is correct?

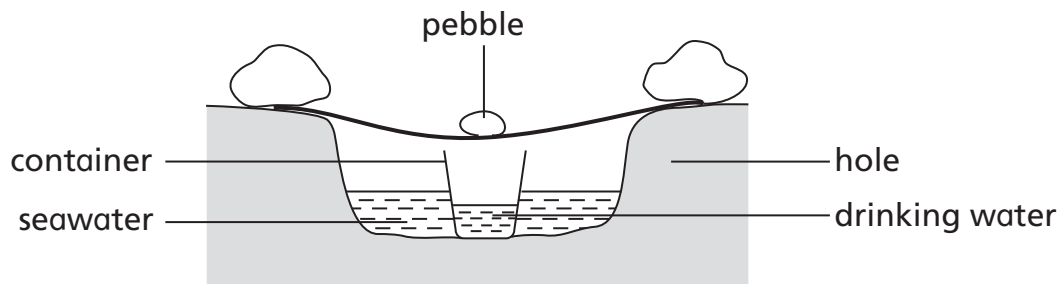
- (1) It is easier to magnetise the steel bar than the iron bar.
 - (2) It is easier to demagnetise the steel bar than the iron bar.
 - (3) The iron bar retains magnetism more than the steel bar.
 - (4) The iron bar is more suitable for making an electromagnet.
26. When James takes a hot shower in a hotel bathroom, he observes that area P of the bathroom mirror remains clear while area Q becomes misty. This allows James to look at his own reflection in area P of the mirror.



There is a heater behind area P but not behind area Q of the mirror. Which statement explains why area P of the mirror remains clear?

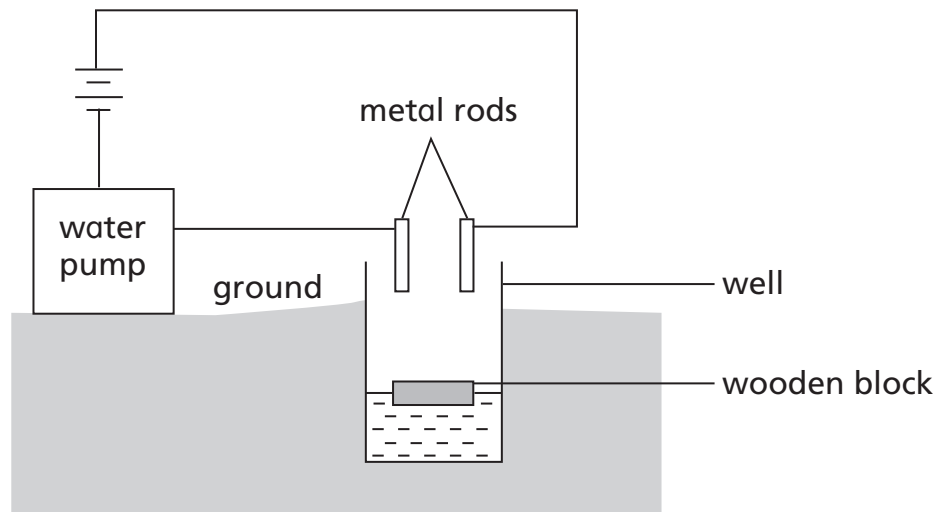
- (1) Water vapour does not lose heat to warm area P and condense.
- (2) Water vapour does not gain from warm area P heat and condense.
- (3) Water vapour does not lose heat to warm area P and evaporate.
- (4) Water vapour does not gain heat from warm area P and evaporate.

27. A team of students uses the following set-up to obtain drinking water from seawater.



Which way would allow more water to be collected in the shortest time?

- (1) Make a wider hole.
 - (2) Use a larger container.
 - (3) Add more water into the hole.
 - (4) Add another pebble on top of the plastic sheet.
28. The diagram shows a water pump which is in good condition. When there is heavy rain and the wooden block touches the two metal rods, the water pump, which is in working condition, does not operate.



Which change would help to make the water pump operate **only** when there is a heavy rain?

- (1) Add more batteries.
- (2) Connect the metal rods with a copper wire.
- (3) Wrap the wooden block with aluminium foil.
- (4) Replace the wooden block with a metal block.

BLANK