MID-YEAR EXAMINATION

SCIENCE
(BOOKLET B)

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

INSTRUCTIONS TO CANDIDATES

- Follow ALL instructions carefully.
- Answer ALL questions.

For questions 29 to 40, write your answers in this booklet. The number of marks available is shown in brackets [ ] at the end of each question or part question.

[44 marks]

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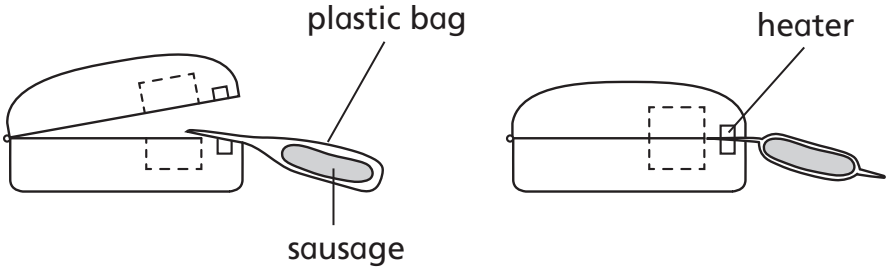
29. Camila places some sausages in a plastic bag and uses the machine shown below to remove air from the plastic bag. The machine then applies heat to seal the opening of the plastic bag.



Camila has two sealed plastic bags, A and B, that contain sausages. She opens plastic bag A and then leaves both plastic bags on the table for three days.

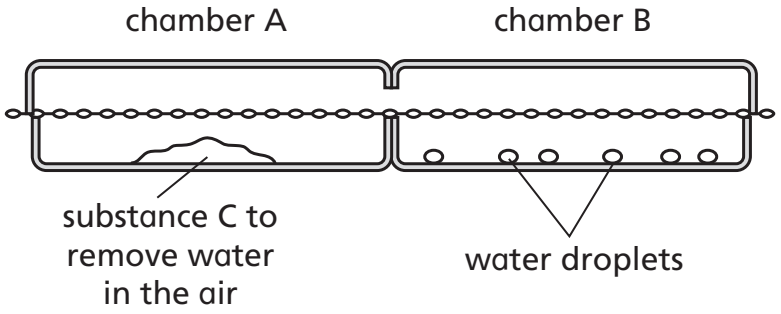
(a) After three days, Camila observes that mould grows on the sausages in plastic bag A while no mould grows on the sausages in plastic bag B. Why? [1]

_____

(b) State one variable that must be kept constant in Camila's experiment. [1]

_____

30. Henry used the following set-up to investigate the living conditions an earthworm prefers.



(a) In the diagram, mark an X to show the position at which Henry should release the earthworm. [1]

(b) The earthworm breathes through moist skin. In which chamber would the earthworm prefer to be? Explain. [1]

_____

(c) Earthworms eat dead leaves. How does adding earthworms and dead leaves to the soil contribute to healthy growth of plants? [2]

_____

_____

31. The diagram shows a food chain.

algae → tadpole → nymph of insect D

(a) How many stages are there in the life cycle of insect D? [1]

_____

(b) The tadpole and the nymph of insect D have gills used for gaseous exchange. Describe the gaseous exchange carried out by gills. [1]

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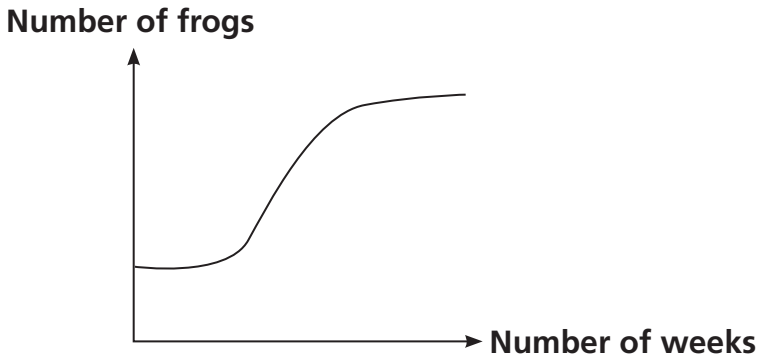
_____

(c) Study the following graph that refers to the pond.



Farmers spray insecticide on a rice field near the pond affecting the number of adult insect D. Explain how this causes the change shown in the graph. [2]

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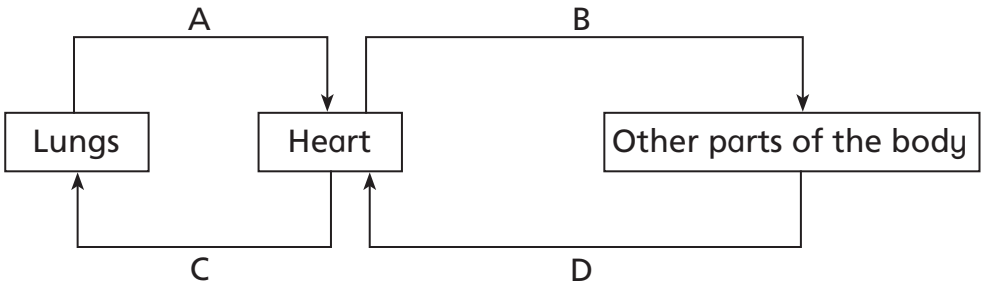
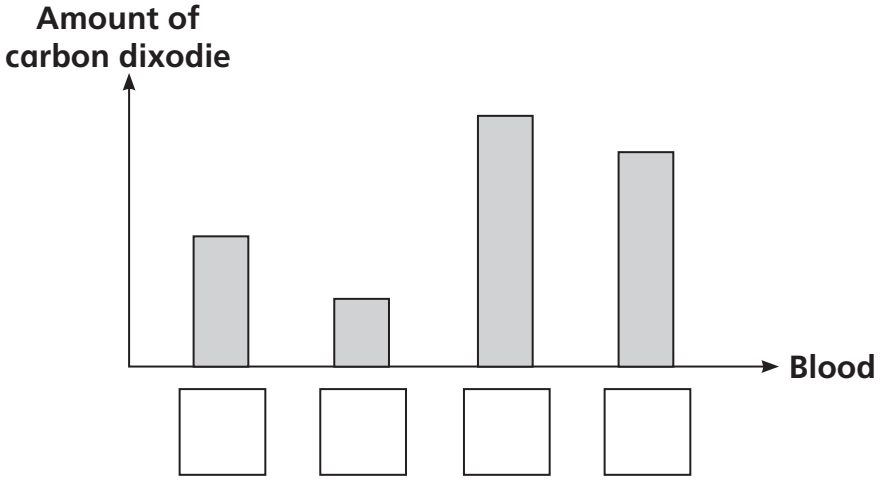
_____

32. The diagram shows the flow of blood between different parts of the body.

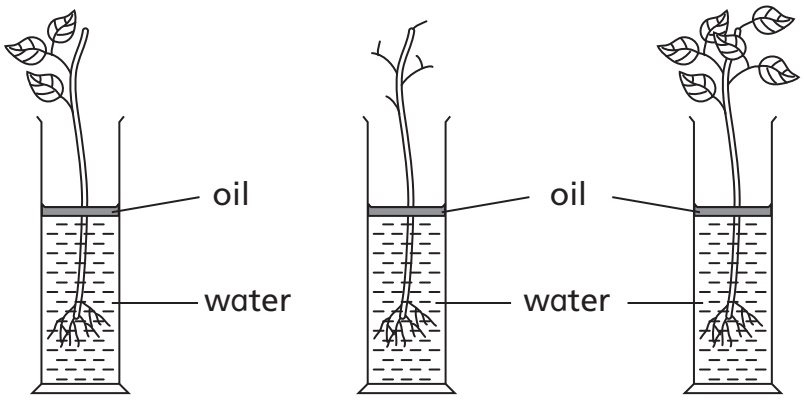


(a) Write down A, B, C and D in the following graph. [1]



(b) State whether the amount of blood supplied to the legs will increase or decrease when an athlete begins to run. Explain your answer. [2]

33. Jackson carries out the following experiment to find out how the number of stomata affects the rate of absorption of water by the roots of a plant.

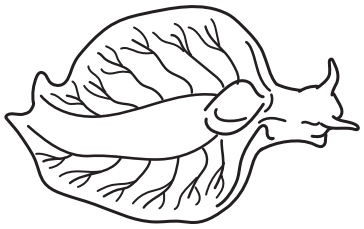


(a) Based on the diagram, explain why it may not be necessary for a control set-up containing water without a plant. [1]

(b) Which plant will absorb the greatest amount of water in the same time period? Explain in terms of stomata. [2]

(c) Explain why deforestation will decrease the amount of rainfall. [2]

34. Animal E, which lives in the sea, has a soft body which allows some light to pass through. It appears green due to plant-like microorganism B that lives in its body. There are also bacteria K found in the cells of microorganism B. Bacteria K produce toxic substances which are harmful to other animals but do not harm animal E.



(a) Why is it important that the body of animal E allows some light to pass through? [1]

_____

(b) During digestion, microorganism B is broken down but the chloroplasts are not broken down. Why does animal E not digest the chloroplasts? [1]

_____

(c) Animal E lives in shallow water and spreads out its body. Explain how animal E increases the rate of photosynthesis carried out by the chloroplasts in its body. [2]

_____

_____

(d) How do bacteria K benefit animal E? [1]

_____

35. The flowers of plant P are normally pollinated by bats. To reduce the chance of pollination within the same plant, a farmer uses a paintbrush and a bowl to carry out pollination across different plants by hand.

(a) Explain how the lamp on his head enables the farmer to see the flowers of plant P at night. [1]

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(b) Explain how the farmer uses the paintbrush and bowl to pollinate by hand. [2]

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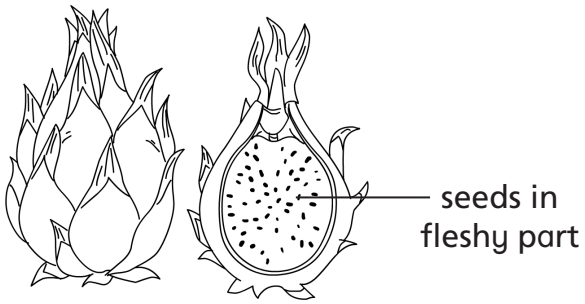
_____

(c) Najib cuts open the fruit of plant P.



(i) Najib observes many seeds in the fruit. Based on this observation, what can be said about the flower of plant P? [1]

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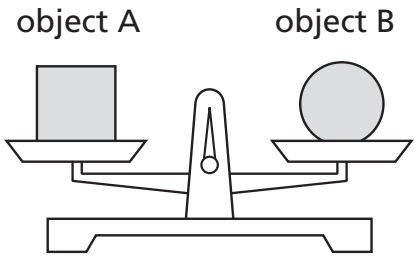
(ii) State the seed dispersal method of plant P. [1]

_____

36. Elvis placed two objects, made of the same metal, on each side of a lever beam.



(a) Elvis then placed each of the two objects into a container of water. Would each object cause the same change in the water level? Explain. [2]

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_____

(b) Explain how object B can be made into the shape of object A. [2]

_____

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37. Muthu sets up an experiment using wires of metal M of different length L and cross-sectional area A as shown in diagram 1. Instrument C is used to measure the electric current through the wire.

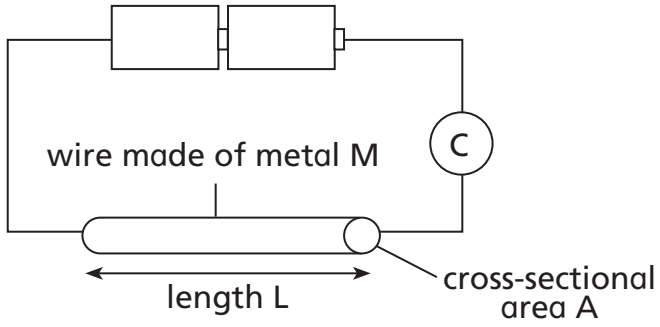

Diagram 1

Wire	Length L (cm)	Cross-sectional area A (cm^2)	Electric current (units)
P	50	4	40
Q	100	4	20
R	50	9	80
S	100	9	40

(a) Which two wires should Muthu compare to find out how the length of the wire affects the electric current flowing through it? [1]

_____

(b) How does the thickness of the wire affect the electric current flowing through the wire? [1]

_____

(c) Muthu makes a toy house as shown in diagram 2.

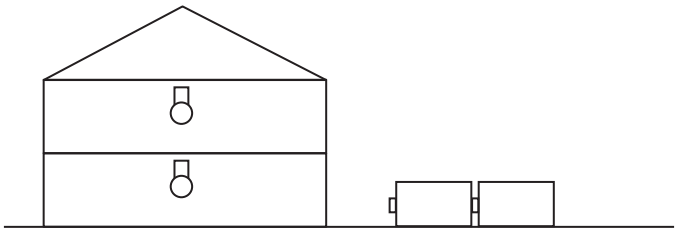

Diagram 2

(i) Draw, on diagram 2, a circuit that enables Muthu to switch on or off each lamp without affecting the other lamp. [2]

(ii) Which wire, P, Q, R or S, should he use so that the lamps are as bright as possible? [1]

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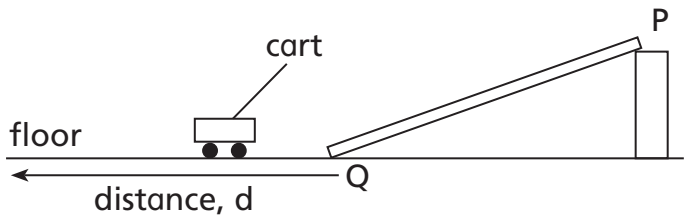
38. Han Cheng releases a cart from the top of a slope PQ and measures the distance d that the cart moves on the floor.



He changes the mass of the cart and repeats the experiment.

Mass of cart (g)	Distance d (cm)
10	10.5
20	10.3
30	10.4

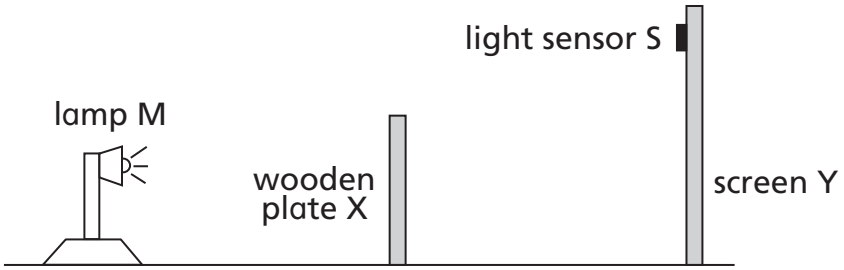
(a) Explain, in terms of energy, why the carts stop after traveling distance d on the floor. [1]

_____

(b) What is the relationship between the mass of the cart and distance d? [1]

(c) State one variable that will increase distance d. [1]

39. Jimmy sets up the following experiment in a dark room.

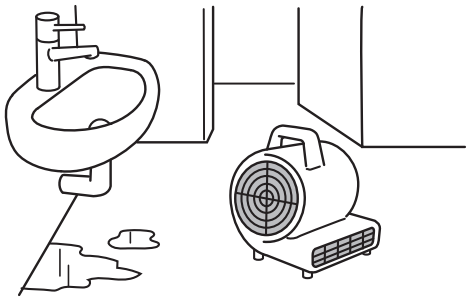


He moves lamp M towards wooden plate X.

(a) How will the height of the shadow of X change? [1]

(b) How will the light intensity measured by the light sensor S change? [1]

40. Jia Wen switches on a blower fan after cleaning the toilet floor. There is a heater in the blower fan.



(a) Write down the energy conversions that occur when Jia Wen switches on the blower fan. [1]

_____

_____

(b) How does the wind from the blower fan dry the wet floor quickly? [1]

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