

Answer

2024
Methodist Girls' School Prelim

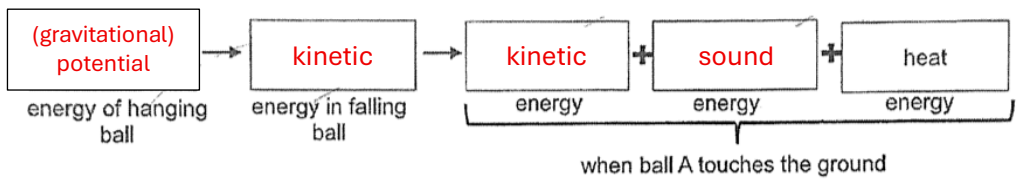


Booklet B

29)	a) Larva. <u>In stage A, the larva feeds on food but in stage B, the pupa does not eat.</u> [1m] b) When the male mosquito eat the nectar, <u>pollen grains from the anther is brushed against the body and are carried by the mosquito to the stigma, allowing pollination.</u>[1m] <u>Fertilisation will then take place whereby the ovule will form the seed to be dispersed and germinate to a new plant T.</u> [1m]
30)	a) A. There were <u>more plants in trough A, so more roots will anchor and hold onto more soil, causing less soil to be washed into A.</u> [1m] b) C is a (positive) <u>control set-up to compare and confirm that the amount of soil being washed into the bowl is only affected by the amount of plants</u> [1m] and not other variables. c) The factory <u>discharged waste products and chemicals into the river which flows downstream and will kill more fish.</u> [1m]
31)	a) P must be more or equal to Q [0.5m] R must be less than Q [0.5m] Amount of oxygen (units) P Q R → Blood

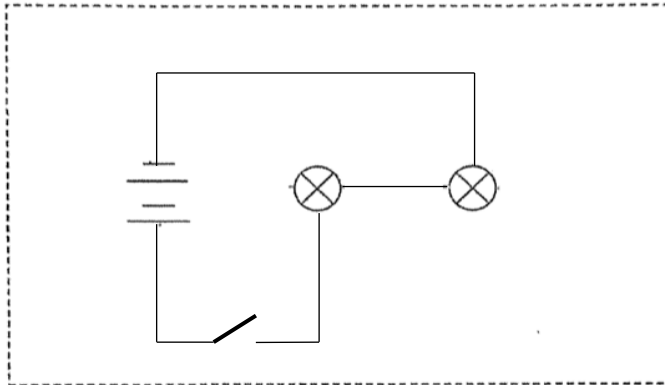
	b) heart, blood, blood vessels [1m] c) <u>Digested food from the small intestine is absorbed into the blood.</u> [0.5m] The <u>heart pumps blood high in digested food from the small intestine to be circulated to all parts of the body.</u> [1m] <u>Blood containing oxygen and digested food will be carried to the digestive organs to release energy</u> [0.5m] for them to carry out digestion.
32)	a) When there are <u>predators around, the clownfish seeks shelter and hides in the poisonous sea anemone,</u> [1m] so the clownfish will not be eaten. b) Decrease. <u>More sea slugs will feed on more sea anemone, causing the death rate to increase.</u> [1m] Due to less sea anemone, <u>there is less shelter for the clownfish, so more clownfish will be killed and eaten by its predators.</u> [1m] c) The green algae can <u>carry out photosynthesis, so the carbon dioxide from sea anemone will be taken in and oxygen is produced for the sea anemone.</u> [1m]
33)	a) The feathers trap <u>air which is a poor conductor of heat, so the warm body of penguin will lose heat slower to the colder surroundings.</u> [1m] b) i) Penguin has a <u>streamlined body which reduces water resistance against motion</u> [1m] as it is swimming. ii) The <u>black feathers allow the penguin to camouflage with / blend into the dark ocean, so the penguin can hide from its predators</u> [1m] and will not be eaten.

34)	a) As the distance of the lamp from the pondweed increased, the volume of gas produced decreased. [1m] b) When the pondweed is further from the light source, the light intensity decreased, so <u>the rate of photosynthesis decreased, causing less oxygen bubbles to be produced.</u> [1m] c) <u>Repeat the experiment at least 3 times and calculate the average.</u> [1m] d) Y. <u>Based on the graph and comparing X with Y, given the same low intensity of light (eg : 10 units), plant Y has higher rate of photosynthesis than plant X.</u> [1m] When Y is placed at a shady pond, Y can make <u>more food which allows Y to carry out its life processes more efficiently.</u> [1m]
35)	a) A. The <u>freezing point of water is 0°C, so the water can lose heat to the freezer and freezes into ice.</u> [1m] b) The pure chocolate cubes are <u>solid, so there are air spaces between the cubes that occupy the space.</u> [0.5m] When <u>melted into liquid, the height decreased as there are no air pockets.</u> [0.5m] c) No. Both <u>solid and liquid chocolate has definite volume, hence the volumes are the same.</u> [1m]
36)	a) As <u>the temperature of the water increased, the amount of water left in the beakers decreased more.</u> [1m] b) To ensure that <u>the temperature of the surrounding air to be constant,</u> [0.5m] so that there is <u>only one changed variable, which is different temperatures of water.</u> [0.5m]

	c) The <u>temperature of the water must be kept constant / the same</u> [1m] , e.g 30°C. By having <u>different-sized containers, the exposed surface area of water is being changed.</u> [1m]
37)	a) <u>Frictional force opposes motion of an object.</u> [1m] b) No. Given the same mass (10g), <u>the frictional force between the puck and the surface is the same</u> [1m] <u>going against same amount of motion of the moving puck.</u> [0.5m] <u>Surface area in contact does not affect friction.</u> [0.5m]
38)	a) 1 mark  b) Louder. With shorter spring, ball A is raised higher above ground, so <u>A possessed more (gravitational) potential energy which is converted to more kinetic energy when ball A is falling down</u> [1m] and then <u>converted to more sound energy when A hits the ground.</u> [1m]
39)	a) Bar X is magnetic. [1m] b) When the switch was closed, <u>electric current flows through the iron cylinder, causing it to become electromagnet which attracts bar X.</u> [1m] As <u>the magnetic force of attraction is greater than the elastic spring force of the spring,</u> [1m] the metal tray moved downwards.

c) Change to **a less stiff spring**. [1m] When being compressed, **there is less elastic spring force to go against the same amount of magnetic force,** [1m] hence causing the metal tray to move further downwards.

40) a) 1 mark



b) When one of the bulb is blown / fused, the other bulb will not light up as well. [1m]

c) 1 mark for correct arrangement of **wires to both switches**
1 mark for correct arrangement of wires with respect to tip and casing of the bulb.

