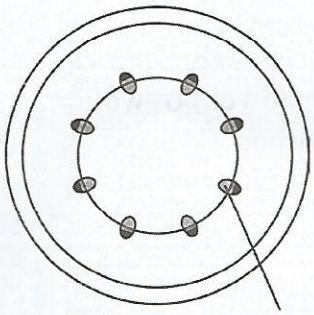
5.3.1 Biology Paper 1 (231/1)

1.	To expose the leaves (or increase the surface area exposed) to light/ carbon (IV) oxide/moisture/water; for maximum manufacture of food/ photosynthesis;	(2 marks)
2	(a) (i) Cambium (tissue);	(1 mark)
	(ii) For secondary growth (increase in the girth) of the plant;	(1 mark)
	(b) (i) 	(1 mark)
	(ii) • Elongated, hollow and firmly connected to one another forming a composite material/for strength; • Lignified walls for strength; • Have pits to allow for passage of materials; • Narrow to enhance capillarity; • Hollow for passage of materials;	(2 marks)
3.	• Twinning around other plants/surfaces; • Turgor pressure of the living cells; • Use of tendrils;	(2 marks)
4.	(a) Chitin;	(1 mark)
	(b) • (Hardened to) support/protect inner, delicate tissues; • Water-proof to prevent (excessive) water-loss/desiccation; • For muscle attachment; • For movement;	(2 marks)
	(c) Hinders/limits (smooth/continuous) growth;	(1 mark)
5.	(a) Provides the fish with buoyancy/adjust its vertical position in relation to depth in water (when inflated or deflated);	(1 mark)
	(b) Pointed, streamlined, reducing resistance as it move/cuts through the water easily/has mucous/slimy substance that reduces friction, enhancing movement;	(1 mark)

6.	(a) (i) Thoracic (vertebra); (ii) Thoracic region;	(1 mark) (1 mark)
	(b) Neural spine;	(1 mark)
	(c) Rib (bone);	(1 mark)
7.	(a) Condensation;	(1 mark)
	(b) • Provides energy (during respiration); • Are building units for larger/complex carbohydrates;	(1 mark)
8.	(a) (i) Lime water turned milky/forms a white precipitate/turbid; ii) Grasshoppers exhale carbon (IV) oxide; which forms a white precipitate with lime water;	(1 mark) (2 marks)
	(b) Rate of formation of the precipitate will be slower/no white precipitate will form in the test tube; (part of) the carbon (IV) oxide (produced by grasshoppers) is used up by the growing plants to make food/photosynthesize);	(2 marks)
9.	**Glycolysis** / **Kreb's cycle** a) In the cytoplasm / a) In the matrix of the mitochondria; b) Yields less energy (about 2 molecules of ATP) / b) Yields more energy (about 38 ATP molecules);	(2 marks)
10.(a)	Gaseous exchange involves passage of respiratory gases (oxygen/carbon (IV) oxide) across respiratory surfaces; while respiration is the chemical breakdown/oxidation of substrates/food substances in the living cells (to release heat/energy, carbon (IV) oxide and water);	(2 marks)
(b).	• Releases oxygen into the water for use by other organisms (during the day while photosynthesizing); • Utilizes the CO_2 produced during respiration of other organisms in the pond reducing the acidity in the water/pond. • Used as food by other organisms in the pond;	(2 marks)
11.	• Survives harsh environmental/climatic conditions and predators; • Feeds on a variety of food;	(2 marks)
12.	**Diplopoda** / **Chilopoda** • Cylindrical / • (Dorso-ventrally) flattened; • More segments (range from 25 – 100) / • Fewer segments (between 15 – 21); • Two pairs of legs per segment / • One pair per segment;	(3 marks)

13.	(a) • Body covered with scales; • Ectothermic; • Lay eggs; • Poikilothermic;	(2 marks)
	(b) Cilia/cilium;	(1 mark)
14.	(a) (i) Specimen bottle;	(1 mark)
	(ii) To be able to see through it/glass is transparent hence some features on the specimen can be seen/studied directly when the specimen is in the bottle; OWTTE	(1 mark)
15.	(a) • Tube nucleus disintegrates; • One of the male nuclei fuses with the egg cell nucleus; (forming a diploid zygote which develops into an embryo); • The other male nucleus fuses with the polar nucleus to form a triploid nucleus;	(2 marks)
	(b) • Neutralizes the spermatozoa; • It's alkaline, neutralizing the vaginal fluids; • Activates sperms;	(2 marks)
	(c) Oxytocin hormone;	(1 mark)
16.	(a) • External fertilization occurs in amphibians/fish; • The females lay eggs (in water) the males shed sperms on the eggs to fertilize them externally; • Internal fertilization occurs in mammals; the eggs develop within the females' body (uterus) till parturition;	(2 marks)
	(b) Wind (pollination);	(1 mark)
17.	(a) Salivation;	(1 mark)
	(b) Olfactory cells;	(1 mark)
18.	(Farmers) prune fruit/horticultural crops; encouraging sprouting of branches, leading to increased yields;	(2 marks)
19.	(a) Individuals with sickle-cell traits do not succumb to malarial attacks; hence over time, they reproduce/give rise to more individuals with similar traits in such regions;	(2 marks)
	(b) Distilled water is hypotonic compared to the (individual patient's) internal body fluids; by osmosis; the cells would take in distilled water, swell and burst/haemolyse (leading to death/more damage;	(3 marks)
20.	(a) Active transport/diffusion;	(1 mark)

	(b) Water was seen to have risen in the capillary tube; due to the root pressure in the (roots of the stump); the water molecules in the (thin) capillary tube formed a continuous stream due to cohesive forces between the water molecules/adhesive forces between water molecule and the tube;	(3 marks)
21.	(a) (i) The termites will have moved to chamber M;	(1 mark)
	(ii) The termites were attracted to: • the humid/moist conditions in chamber M; • the darkness in chamber M (as a result of the opaque cover/ lid);	(2 marks)
22.	(i) Secretes the synovial fluid (which lubricates the joints);	(1 mark)
	(ii) Provides attachment of muscles to the bone;	(1 mark)
23.	Parental phenotypes Dwarf Dwarf ; Parental genotypes Dd Dd ; Gametes D d D d Offspring genotypes Dd DD Dd dd ; lives dies lives lives Chances of survival is ¾ (75%);	(4 marks)
24.	The 8-year-old grandson has a higher BMR compared to the 55-year-old man; the son is more active/has actively dividing cells; hence a higher rate of BMR to generate the necessary energy/replenish the lost heat (since the son has a higher surface area to volume ratio exposed for heat loss); OWTTE	(3 marks)
25.	(i) **Division**: Spermatophyta;	(1 mark)
	Reason: Presence of flowers/roots/leaves/differentiated plant body;	(1 mark)
	(ii) **Class**: Dicotyledonae;	(1 mark)
	Reason: Net-veined leaves/broad leaves/tap root system/ petiole/ presence of flower;	(1 mark)