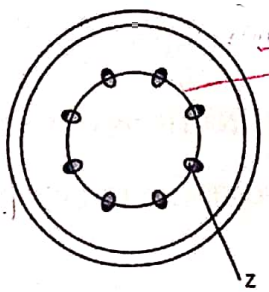
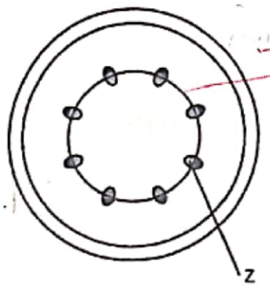
1.	To expose the leaves (or increase the surface area exposed) to light/carbon(IV) oxide/moisture/water; for maximum manufacture of food/ photosynthesis;	(2 marks)
2	(a) (i) Cambium (tissue); Reg cork cambium Acc cambium ring / vascular cambium; (ii) For secondary growth (increase in the girth) of the plant;	(1 mark) (1 mark)
	(b) (i)  Cambium – cells have dense cytoplasm / many cells vacuoles / small for rapid mitotic division / give rise to secondary growth; – Has actively dividing cells / meristematic cells to give rise to new cells; – Cell have numerous mitochondria to provide energy for cell division; first 2 Xylem Narrow to enhance capillarity; (ii) • Elongated/ ~~hollow and~~ firmly connected to one another forming a composite material/for strength/ support; • Lignified walls for strength/ support; • Have pits to allow for passage of materials; ~~Any 2~~ first 2 Holes for passage of material;	(1 mark) (2 marks)
3.	• Twinning around other plants/surfaces; Reg Twinning • Turgor pressure of the living cells; • Use of tendrils; ~~Any 2~~ First 2	(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; ~~Any 2~~ Main First 2	(2 marks)
	(c) Hinders (smooth/continuous) growth; Reg prevents growth Acc limit 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 reduce friction (enhancing movement);	

- Inflexible head that enable it to maintain forward thrust ; Mark any 1

	reduces friction (enhancing movement);	(1 mark)
6.	(a) (i) Thoracic (vertebra); Reg Thoracic cavity / Chest cavity	(1 mark)
	(ii) Thoracic (region); Acc thorax, chest region	(1 mark)
	(b) Neural spine; Acc Spinous Process	(1 mark)
	(c) Rib (bone);	(1 mark)
7.	(a) ~~Hydrolysis~~; Condensation	(1 mark)
	(b) • Provides energy (during respiration); • Are building units for larger/complex carbohydrates; compounds **Any 1**	(1 mark)
8.	(a) (i) Lime water turned milky/forms a white precipitate/turbid; ii ✗ i 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 / In the (matrix of the) mitochondria; b) Yields less energy (about 2 molecules of ATP) 210 KJ/mol / Yields more energy (about 38 ATP molecules); 2670 KJ/mol	(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; **(Any 2)**	(2 marks)
11.	• Survives harsh environmental/climatic conditions/~~and~~ predators; • Feed on a variety of food; OWTTE	(2 marks)

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); Rej cork cambium Acc cambium ring / vascular cambium; (ii) For secondary growth (increase in the girth) of the plant;	(1 mark) (1 mark)
	(b) (i)  Cambium - cells have dense cytoplasm / many cells vacuoles small for rapid mitotic division / give rise to Secondary growth; - Has actively dividing cells / meristematic cells to give rise to new cells; - cells have numerous mitochondria to provide energy for cell division; first 2 xylem Narrow to enhance capillarity;	(1 mark)
	(ii) • Elongated / hollow and firmly connected to one another forming a composite material/for strength / support; • Lignified walls for strength; / support; • Have pits to allow for passage of materials; Any 2 first 2 Hollows for passage of materials;	(2 marks)
3.	• Twinning around other plants/surfaces; Rej Twinning • Turgor pressure of the living cells; • Use of tendrils; Any 2 First 2	(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; Any 2 Main First 2	(2 marks)
	(c) Hinders (smooth/continuous) growth; Rej Prevents growth Acc limit 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 (when moving / movement); - Inflexible head that enable it to maintain forward thrust; Mark any 1	

12.	**Diplopoda** • Cylindrical • More segments (range from 25 – 100) • Two pairs of legs per segment **Chilopoda** • (Dorso-ventrally) flattened; • Fewer segments (between 15 – 21); • One pair per segment;	(3 marks)
13.	(a) • Body covered with scales; • Ectothermic;	(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 even 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; **(Any two)**	(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)

Internal
- occurs in mammals/birds/reptiles
- occurs within the body of the female/living organism

External
- occurs in amphibians and fish
- females lay eggs & males shed sperms on eggs to fertilize them externally

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;	(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;	(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) Provide 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**: Angiospermae;	(1 mark)

	Reason: Presence of flowers Body differentiated into stem, roots & leaves		(1 mark)
	(ii) **Class:** Dicotyledonae;		(1 mark)
	Reason: Net-veined leaves/broad leaves/tap root system/ presence of flower leaves with petiole / leaf stalk		(1 mark)