4.4 BIOLOGY (231)

4.4.1 Biology Paper 1 (231/1)

1. (a) Acquisition and utilization of nutrients; (1 mark)

   (b) Elimination of metabolic wastes to prevent accumulation to toxic level; (1 mark)

2. (a) A period of rest in which a seed performs its physiological processes slowly and utilizes little food; (1 mark)

   (b)
   - Chemical/growth inhibitors;
   - Hard/impermeable seed coat;
   - Low / freezing temperatures;
   - Under developed embryo/immature embryo;
   - Low concentration of hormones;
   - Lack of appropriate light wavelength;

   (max 3 marks)

3.
   - Exchange of nutrients /metabolic wastes/gases between the mother and foetal circulatory systems;
   - Secretion of progesterone hormone;

   (2 marks)

4. (a) Tube nucleus;

   (b)
   - One male nucleus fuses with the egg cell nucleus to form a zygote;
   - The other male nucleus fuses with the polar nuclei to form the endosperm;

   (2 marks)

5. (a) Hypertonic solution; (1 mark)

   (b) Volume of sugar solution increases in the thistle funnel while that of distilled water in the beaker reduces; because the thistle funnel gains distilled water by osmosis. (2 marks)

6.
   - Cell division;
   - Cell elongation;
   - Development of adventitious roots;
   - Formation of callus tissue;
   - Causes apical dominance;
   - Causes tropic responses.

   3 x 1 (3 marks)

7. Object length = 12 cm
Drawing length = 6 cm

$$Mg = \frac{Drawing\ \ length}{Object\ length}; \qquad = \frac{6}{12};$$

= X 0.5;

(2 marks)

8. - Phenotype is the outward appearance of an organism while Genotype is the genetic make up of an organism; (1 mark)

9. - Act as shock absorbers;
- Allow smooth movement between the vertebrae/reduce friction;

(2 marks)

10. (a) - Absorption of materials e.g. diffusion of digested food into the blood stream;
- Gaseous exchange e.g. CO_2/O_2 diffuses from capillaries into the alveoli.
- Excretion of nitrogenous wastes; e.g urea diffuses from blood capillaries into the elimination sites. (max 4 marks)

(b) (i) Crenated cell is a shrunk animal cell that has lost water by osmosis;
(1 mark)

(ii) Flaccid cell is a flabby /shrunk plant cell that has lost waster by osmosis;
(1 mark)

11.

Tactic Responses	**Tropic Response**
- Are locomotory	- Are growth responses;
- Are fast	- Are slow;
- Not influenced by growth hormones	- Are caused by growth hormones;
- Temporary	- Permanent;

(3 marks)

12. (a) (i) Rib-cage/chest cavity; (1 mark)
(ii) Diaphragm; (1 mark)

(b) The balloons are inflated; (1 mark)

(c) Pulling down the string increases the volume of **D**, hence decreasing the pressure inside;
The low pressure causes external atmospheric air to rush in and inflate the balloons;

(2 marks)

13. (a) Trap foreign particles entering the eye;
Produce fluid/tears; (1 mark)

(b) - Moistens the cornea;
- Wash foreign materials out of the eye;
- Antiseptic / kills harmful microorganisms; (max 1 mark)

14.

DNA	RNA
Double stranded/double relix	Single stranded;
Has Thymine	Thymine is replaced by uracil/reject Thiamin;
Has the four nitrogen base pairing pattern	Lack the four nitrogen base pairing pattern;
Deoxyribose sugar	Ribose sugar;

(3 marks)

15. (a) Skeletal muscles / striated muscles; (1 mark)

(b) Tendon is a (inelastic) tissue that attaches muscles to bones while Ligament is a (inelastic) tissue that attaches a bone to another bone of a movable joint;
(1 mark)

16. (a) Sensory neurone; (1 mark)

(b) Cell body is located off the axon/tied outside the CNS; (1 mark)

(c) Schwann cell; (1 mark)

(d) (i) Receipt/transmits impulses to neighbouring neurons in the CNS from sense organs; (1 mark)
(ii) Insulates the axon/accept dendron for axon; (1 mark)

17. The blind spot lacks both cones and rods hence images are not perceived; (1 mark)
Accept photoreceptor cells for cones and rods;

18. (a) To provide a cool environment; that is conducive for sperm formation; (2 marks)

(b) Progesterone hormone; is secreted by the placenta to maintain the pregnancy;
(2 marks)

19. Due to limited oxygen, haemoglobin combines with carbon (II) oxide to form carboxyhaemoglobin;
Carboxyhaemoglobin does not readily dissociate hence reduces the capacity of haemoglobin to transport oxygen; Carbon (II) oxide is therefore a respiratory poison if breathed in for a long time;
(3 marks)

20. (a) Packaging of substances/glycoproteins/ transportation of glycoproteins;
Secretion of synthesized proteins and carbohydrates;
Formation of lysosomes/modification of carbohydrates to form glycoproteins;
(1 mark)

(b) - Digestion of food/Breakdown large molecules;
- Destroy worn out organelles or cells/tissue;
(max 1 mark)

21. (a) Exoskeleton; (1 mark)

(b) Endoskeleton; (1 mark)

22. (a) Appendix/accept nictating membrane; coecum and ear drum;
Tail/coccyx; (1 mark)

(b) They have a gene for resistance/acquire it through mutation;
The gene for resistance is passed to offsprings establishing a population of resistant forms;
(2 marks)

23. (a) **K** - Photosynthetic products/manufactured foods example vitamins/alicose/proteins/ sucrose/maltose/fructose/lipids/nitrates; (1 mark)
L - Water and mineral salts; (1 mark)

(b) The substances are moved into the star shaped xylem; (1 mark)

24. **M** - lungs; (1 mark)

N - Urea, ammonia, ; (1 mark)

P - Digested food, water; mineral ions; (1 mark)

25. - Stimulates maturation of the Graafian follicle/stimulates ovulation;
- Stimulates corpus luteum to secrete progesterone hormone;
- Stimulates release of androgens;
- Stimulates development of corpus luteum;
(2 marks)

26. (a) (i) Diffusion; (1 mark)

(ii) Sea water contains a higher concentration of sodium ions than the cell sap;
(1 mark)

(b) (i) Iodide ions; (1 mark)

(ii) Sea water has a lower concentration of iodide ions than the cell.
The plant requires energy to take up the iodide ions (by active transport);
(1 mark)

27. (a) Spiracle; (1 mark)

(b) Keep the trachea open for air passage; (1 mark)

(c) - Lacks spiral bands of chitin / to make it thin; for diffusion of gases;
- Moist; to dissolve respiratory gases;
(2 marks)