

TERM 2 - 2023

BIOLOGY – PAPER ONE (231/1)

FORM FOUR (4)

MARKING SCHEME

1. a) Hygrometer; *1x1=1 mark*
 b) Generates its own energy; and recycles its nutrients; *2x1=2 marks*

2. Enabled identification of defective genes thus easen their correction;
 Enabled identification of genes susceptible to diseases to easen their prevention;
 Offers opportunity for production of drugs/vaccines since researchers are able to predict protein produced by specific genes; *Mark 1st TWO* *2x1=2 marks*

3. a) Dissolve respiratory gases for easier diffusion; *1x1=1 mark*
 b) Offer a shorter diffusion distance for respiratory gases hence faster diffusion; *1x1=1 mark*

4. a) Entamoeba histolytica *1x1=1 mark*
 b) Vibrio cholera *reject wrong spellings/Not Underlined separately/Lower case 'E'/'V'*
1x1=1 mark

5. a) Arginase; *1x1=1 mark*
 b) Q requires less water for excretion; since it is less toxic;
 Ammonia is toxic; thus would have required more water to be excreted; *2x1=2 marks*

6. i) Gives pure insulin/No contaminants/Impurities thus no allergic reactions; Faster means of production/Produces larger quantities; *Mark Any 1* *1x1=1 mark*
 ii) Prevent digestion since insulin is protein in nature; *1x1=1 mark*

7. a) Lost function; thus smaller in size; *1x1=1 mark*
 b) Absorption of water molecules into the blood;
 Passage of undigested materials to the rectum; *2x1=2 marks*

8. a) Diuresis/Diabetes insipidus; *1x1=1 mark*

- b) Goitre; *1x1=1 mark*
9. a) Leads to developments of adaptations that enhance survival; *1x1=1 mark*
 b) S Consumes protein; that requires a shorter time to digest; or T consumes fiber/cellulose-rich food; that require more time to digest; *2x1=2 marks*
10. a) B;
 b) More active;
 Can live in any habitat; *2x1=2 marks*
11. a) Centriole; *1x1=1 mark*
 b) Mitochondria; *1x1=1 mark*
12. a) Taxis/Tactic/Hydrotaxis/Positive Hydrotaxis; *1x1=1 mark*
 b) Avoid dessication/Conserve water; *1x1=1 mark*
13. a) Heterodont dentition/Teeth of different sizes/functions; *1x1=1 mark*
 b) Protect brain/eyes/ear/tongue/organs in the head region; Attachment of facial muscles; Enable movement in the head region; *Mark 1st 2* *2x1=2 marks*
14. a) i) Q/R; *1x1=1 mark*
 ii) P; *1x1=1 mark*
 b) Brightly coloured/ large/ conspicuous to attract insects for pollination; *1x1=1 mark*
 c) Chemotropism; **reject Chemotrophism** *1x1=1 mark*
15. a) Photosynthesis; *1x1=1 mark*
 b) Highest amount/Number of bubbles/40 bubbles produced per 30 seconds; More light/Closer to light source; Thus higher rate of photosynthesis; *3x1=3 marks*
16. a) Defends body against pathogens/infections/diseases; *1x1=1 mark*
 b) Sickle Cell Trait; **reject Sickle Cell/Sickle Cell Anaemia** *1x1=1 mark*
 c) i) AT; *1x1=1 mark*

- ii) AA, AT, AT and TT; **ACCEPT** AA, AT and TT *2x1=2 marks*
 d) They are tolerant/have mild resistance to malaria; *1x1=1 mark*

17. a) Efficient supply of Oxygen to tissues/Removal of Carbon (IV) Oxide (Since there is no mixing of blood rich in Oxygen and that which is rich in Carbon (IV) oxide); *1x1=1 mark*
 b) Higher chances of advantageous variations due to crossing over of genes, thus greater adaptations to the environment; *1x1=1 mark*

18. Longer loop of Henle thus increases surface area for water reabsorption; Fewer glomeruli thus reduce surface area for ultrafiltration; Secretes uric acid that requires less water for excretion; *2x1=2 marks*

19. a) Enable vision in both low/dark and high/day light intensity; *1x1=1 mark*
 b) i) B; *1x1=1 mark*
 ii) Lacks retinal convergence/Each cell is linked to its own neurone thus brain receives more accurate information on objects; *1x1=1 mark*

20. 10cells measure 5mm
 1 cell will measure $(1 \text{ cell} \times 5\text{mm})/10\text{cells}$
 $= 0.2\text{mm};$

$$1\text{mm} = 1000\text{micrometers}$$

$$\text{Thus } 0.2\text{mm} = (0.2\text{mm} \times 1000\text{micrometers})/1 \text{ mm};$$

$$= 200 \text{ micrometers}; \quad \text{span style="float: right;">*3x1=3 marks*$$

21. a) i) Secretes testosterone/Androgens; *1x1=1 mark*
 ii) Manufactures Spermatozoa/Male reproductive cells/Male gametes; secretes androgens that cause secondary sexual characteristics/spermatogenesis; *1x1=1 mark*
 b) Reduce amount of heat in the testis/Create a conducive/optimum temperature; for efficient spermatogenesis/sperm-formation; *2x1=2 marks*

22. a) Cotyledon is above the ground; Elongated hypocotyl; *1x1=1 mark*

b) Prevent destruction of the delicate apical buds of the shoot (as it pushes through the soil);

1x1=1 mark

23. a) Colchicine;

1x1=1 mark

b) Chemotherapy; Radiotherapy; Surgery to remove tumor in the lungs; **MARK 1st 2**

2x1=2 marks

24. a) Diffusion;

1x1=1 mark

b) Maintaining set up in optimum temperature/37⁰C; Add Co-factors/Co-enzymes; Maintain Optimum pH; Add More enzymes; Reduce amount of Substrate; **MARK 1st 2**

2x1=2 marks

c) Enzyme Broke down starch into sugar molecules; More sugar molecules inside the visking tube than the surrounding water; a concentration gradient resulted and **sugar** molecules **diffused** into the surrounding water;

3x1=3 marks

25. Allograft is a graft/part of organ/tissue/organ transplanted to another person who is not genetically identical to the donor; Autograft is a graft obtained from the self;

2x1=2 marks

26. Life came into existence from combination of chemical substances; The initial life forms were simpler but changed over years to current complex ones;

2x1=2 marks

27. a) Is a substance that causes an allergic/hypersensitive reaction;

1x1=1 mark

b) Presence of an allergen leads to body/immune cells releasing antibodies; the resulting antibody-antigen reaction leads to cells to burst and release histamine; which increase permeability of epithelial cells causing fluid accumulation thus swellings/as well as inflammation and pain;

3x1=3 marks

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