BIOLOGY PAPER I

(MARKING SCHEME)

1. a) Manufacture of ribosomes;

   b) Monera;

   c) Eukaryotes;

2. a) Glycerol; Fatty acids;

   b) Requires a lot/more Oxygen to oxidise; Insoluble in water thus not easy to transport to respiratory site;

3. a) Melanin;

   b) Influences formation of Vitamin D (in the body); Which is required for absorption of phosphates and calcium ions; important in bone and teeth formation.

4. a) Kidney; b) Liver;

5. a) Process where new off-springs arise without fertilization;

   b) Slower/takes longer time to obtain off-springs; Rely on unpredictable pollination/fertilization that are easily affected by weather changes; variation may lead to disadvantageous traits; Relies on the presence of both parents that may be possible in some cases e.g when one dies;

6. a) Has a taproot;

   b) Stored nutrients are hydrolysed/converted to simpler forms; that are used in cell division/growth (of the seedling);

7. a) Prevent excessive loss of blood/anaemia; Prevent entry of pathogens into the body; Initiate healing of wound;

   b) Convert prothrombin to thrombin; Neutralises anti-clotting factor/Heparin;

8. a) Wind; *Reject* Wind-pollinated

   b) Has feather-like stigma; Long filament/Androecium hangs outside; Reduced petals/bracts to expose the gynoecium/androecium to wind;

9.

Feature	Cone	Rod
Visual acuity	High	Low;
Photochemical	Iodopsin	Rhodopsin;

10. a) Identity: Sensory; *Reject* Unipolar

    Reason : Unipolar; Cell body off the axon;

b) Slow down movement of impulse; to give adequate time for interpretation of the impulse (by brain/CNS);

11. High level of intelligence/Reasoning/Brain capacity; Well-developed speech/effective communication abilities; Upright gait to see far/danger easily; Bipedal locomotion frees hands for other uses; pre-hensile hands for handling various tools; non-opposable toe for stability; 1^{st} 3
12. a) Baking/Manufacture of bread; Brewing Alcoholic beverages; Manufacture of high nutritional value proteins/Single Cell Protein; Manufacture of biofuel/gasohol; Food flavouring; Food conditioning/Preservation; Making vitamin supplements; Ripening of cheese; Food spoilage; *Mark $1^{st}2$*

    b) i) Respiratory enzymes are inactivated;

    ii) Bind to the enzymes permanently or temporarily thus inhibit enzyme action on substrates;
13. Development of new tools/techniques/procedures for biological research; Development of materials for medicine/agriculture/health/industries

    Accept specific examples e.g Drugs/Medicine/Hormones/Vaccine/Cultivars
14.

Continuous Variation	**Discontinuous Variation**
Determined by interaction of many genes	Determined by one or two genes;
Determined by interaction between genes and the environment	Determined by the genes alone;
Has intermediate traits between two extremes	Lack intermediates/Has distinct groups;

Mark 1^{st} 2

b) Organisms with disadvantageous variations are eliminated; those with advantageous variations adapt, survive (and reproduce); accumulation of such variations over time may lead to speciation/emergence of a new species;

15. a) A group of organisms that are structurally similar and freely interbreed to give rise to a fertile/viable offspring;

    b) Came up with binomial nomenclature; Pioneered Modern/Natural classification/taxonomy;

16. d

9cells measure 3.0mm

Therefore 1cell will measure: (1cell x 3.0mm)/9cells = 0.333mm;

	1mm	=	1000micrometers
Thus	0.333mm	=	(0.333mm x 1000micrometers)/1mm;
	Diameter of a cell	=	333micrometers;

b) Viewing of images is indirect/on screen;

17. a) Germinating seeds utilized Oxygen in respiration; the released Carbon (IV) oxide was absorbed by Potassium hydroxide solution; (Thus reduces volume of air in the tube and level of coloured liquid rises)

    b) To preserve/Prevent decomposition/Anaerobic respiration;

18. a) Neural spine; *Reject* Spine alone

    b) Create vertebral column flexibility; Absorb shock; Reduce friction/rubbing together of the adjacent vertebrae; *Mark* 1st 2

19. a) Has numerous mitochondria to generate a lot of energy; for translocation of substances in the phloem;

    Large cytoplasm to store a lot of nutrients; used in respiration to supply energy for translocation;

    b) Release myelin sheath; which insulates the axon;

20. a) Erythroblastosis foetalis/Haemolytic disease of the newborn;

    b) Arises when a Rhesus negative mother carries a subsequent Rhesus positive foetus' pregnancy; particles of foetal erythrocytes pass to the mothers blood leading to formation and accumulation of anti-Rhesus antibodies; which pass to the foetus via placenta causing antibody-antigen reaction that destroy the foetal erythrocytes;

21. ai) *Nitrobacter* sp; *Nitrococcus* sp

    ii) Nitrates;

    b) Low growth; due to loss of soil fertility/Nitrates important in protein synthesis;

22. i) Hypothalamus; ii) Cerebrum; iii) Medulla oblongata;

23. a) No further increase in rate of reaction/Constant; Since other factors were limiting;

b) i) Carbon (IV) Oxide; ii) Fibrinogen;

24. Tail power = {(300mm - 200mm)/300mm} x 100;

= 33.3%;