TERM 2 - 2023

BIOLOGY (231)

FORM TWO (2)

MARKING SCHEME

1. a) Cytology; ***1 mark***
   b) Biotechnology; ***1 mark***
   c) Histology; ***1 mark***

2. a) Increase surface over which water vapour is lost; ***1 mark***
   b) Carries away water vapour; thus increase saturation deficit (around the leaf); ***2 mark***

3. a) Species, Order, Class, Division, Kingdom; ***1 mark***
   b) Organelle, Cell, Tissue, Organ, Organism; ***1 mark***

4. a) Red Blood cell/Erythrocyte; ***1 mark***
   b) No Change in Blood pH; Efficient/Faster due to presence of enzyme carbonic anhydrase; ***2 marks***

5. a) Supplies Carbon (IV) Oxide (which is a raw material for reactions in K); Supplies Chemical Energy/Adenosine Triphosphate; ***2 marks***
   b) Crista; ***reject cristae*** ***1 mark***

6. a) Hold the heart in position; prevent overdilation of the heart; Secretes pericardial fluid (that lubricates the heart during contraction and relaxation/ pumping); ***Mark any 1***
   b) Hold lung in position; Secretes plural fluid (that lubricates the lungs); ***Mark any 1***

7. a) Medulla oblongata; ***1 mark***
   b) External intercostal muscles contract; internal intercostal muscles relax; moving the rib cage upwards and outwards; lung volume increases; while pressure decreases (thus air

rushes into the lungs through the nostril, trachea then bronchi); ***Mark in a sequential order*** ***4 marks***

8. a) Reduce surface area to volume ratio over which heat is lost; thus, less energy required by the animal body; ***2 marks***

   b) More muscle; thus, more energy required for muscular actions; ***2 marks***

9. a) Hypertonic (solution); ***1 mark***

   b) Plasmolysed/ Cell membrane detached from the cell wall/Reduced cytoplasm; since the plant cell has lost more water molecules by osmosis (to the surrounding Solution X/Hypertonic solution): ***2 marks***

   c) Diffusion; ***1 mark***

10. a) Attract and trap small mammals/ animals/ rat/ mice; ***1 mark***

    b) Suck small organisms on tree barks/wall; ***1 mark***

11. a) Binomial nomenclature; **reject** Binomial system ***1 mark***

    b) Panthera leo; **reject** if not underlined separately/Lower case 'P' ***1 mark***

12. a) Cellulose; ***1 mark***

    b) Chitin; ***1 mark***

13. a) Benedict's Solution; **reject** Benedicts/benedict's ***1 mark***

    b) Place 2ml of juice in a boiling tube; Add 2ml of Benedict's solution/Reagent **K**; Boil; **reject** heat ***3 marks***

    c) (K changed from Blue to) Green to Yellow to Orange to Brown; **reject** if wrong sequence given ***1 mark***

SECTION B

14. a) Cellophane; Visking tubing/tube; Dialysis tubing; **Mark** first 2 ***2 mark***

b) Hypotonic (solution); ***1 mark***

c) Q increased in volume/R expanded/Increased in size; since Q is hypertonic/P is hypotonic; thus Q gained water molecules by osmosis; ***3 marks***

d) Allows entry of water molecules; that is a raw material for photosynthesis; ***2 marks***

15. a) i) Product formation reduces then stops; since the enzymes get denatured; ***2 marks***

ii) Optimum pH; More co-enzymes/co-factors; Less Inhibitors; More enzymes; Less substrate; **Mark first 3** ***3 marks***

b) Lactose; ***1 mark***

c) Hydrogen carbonate; ***1 mark***

c) Hydrogen peroxide; ***1 mark***

16. a)

Feature	**Blood Vessel E**	**Blood Vessel G**
Amount of Nitrogenous Wastes	*Less*	*More;*
Oxygen Concentration	*Less*	*More;*

b) i) Semilunar valve;

ii) Bicuspid valve;

c) i) Generate a lot of pressure to pump blood a longer distance/furthest parts of the body; ***1 mark***

ii) Prevent mixing of blood in the right and left chambers; ***Accept: Prevent mixing of blood rich in Oxygen/Low in Carbon (IV) Oxide and that which is low in Oxygen concentration/High in Carbon (IV) Oxide;*** ***1 mark***

Reject: Oxygenated and Deoxygenated Blood

d) Efficient removal of wastes/Supply of Oxygen and nutrients; thus organisms are more active; ***2 marks***

17. a) i) C- Thrombin; ***1 mark***

ii) D – Fibrinogen; ***1 mark***

b) i) Heparin; ***1 mark***

ii) Neutralises any thrombin formed; prevents conversion of prothrombin to thrombin; ***2 marks***

c) (Vitamin) K; ***1 mark***

d) Prevent excess bleeding/loss of blood; Prevent entry of pathogens; ***2 marks***

18. a)

10 cells measure 5mm

Thus 1 cell will measure (1cell X 5mm)/10cells

= 0.5mm;

1 mm = 1000micrometers

Thus 0.5mm = (0.5mm X 1000micrometers)/1mm

= 500micrometers; ***2 marks***

b) i) Tot Mag = Eye piece Lens Magnification X Objective Lens Magnification

= X15 x X40; **reject** if the symbol 'X' is Missing

=X600; **reject** x600/600X/600 ***2 marks***

ii) Total Mag = Object Length/Actual Length

Actual Length = Object length/Total Magnification

= 500micrometers ÷ X600;

= 0.833micrometers;

reject Missing Units/Wrong symbol for 'Micro'

2 marks

c) Cells not linearly arranged; Cells are different sizes; ***2 marks***

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