BIOLOGY

FORMFOUR PARER 1

MARKING SCHEME

1. – Irritability
   - Nutrition
   - Reproduction
   - Locomotion
2. i) Mitochondria
   ii) Chloroplast
3. i) To make thin sections that allow light to pass through.
   ii) To maintain structure of specimen; make the sections hard enough for thin sections to be cut.
   iii) To make cell structures distinct/clear.
4. Contain lytic enzymes that break down foreign materials which can be ingested.
5. Guttation is loss of water in form of water droplets through openings called hydathodes, transpiration is loss of water in form of water vapour through stomata, and cuticle of lenticels.
6. a) For them not to absorb water being conducted through them
   b) Its a strengthening tissue/support /mechanical strength.
7. a) Leukemia
   b) Sickle cell anaemia
8. i) Calcium ions/Ca^{2+}
   ii) Fibrin
9. a) Intermittent growth
   b) Moulting /ecdysis
   c) Ecdysone
10. It's an offspring between a donkey and a Horse that belong in different species; hence cannot produce a fertile offspring.
11. Phylum Arthropoda is the most successful of invertebrates. Explain two characteristics that make them most successful (2mks)

- Hardened exoskeleton made of chitin which protect them from desiccation and predation.
- Have jointed appendages adapted for different functions (2mks)

12. Chordata (1mk)
13. a) Gradual change of living organisms from simple life forms to more complex forms over a long period of time-

    Homologous structures – structures with common embryonic origin but modified to perform different functions.

    b) – Missing links eg some fossils not yet discovered

    - Destruction – earth movement /landslides mass movement may have destroyed existing fossils

    - Soft bodied parts decay away without forming fossils
14. a) i) Ultrafiltration (1mk)

    ii) Sufficient pressure to force the fluid/filtrate through; pores in the endothelium of glomeruli and epithelium of Bowman's capsule to allow selective filtration (2mks)

    b) Afferent arteriole – Reason; has a wider lumen direction of blood flow is towards the glomerulus. (1mk)

    c) Urea; glucose, amino acids; salts (any two 2 x 1=2mks)
15. a) i) Peristalsis

    ii) – Have circular and longitudinal muscles

    - Epithelial linning has goblet cells (2mks)

    iii) Salivary amylase/ptyalin (1mk)

    b) – Lubricate food movement along the gut.

    - Prevents digestion of mucous linning by protease enzymes.

    - Helps food to stick together (2x1=2mks)
16. a) Variegated plants have leaves little chlorophyll hence synthesis less food, non-variegated has leaves that are entirely green-has more chlorophyll hence more synthesis of food (2mks)

    b) Leaves have thin membrane for easy diffusion of CO_2; broad leaves increases surface area for photosynthesis process. (2mks)

17. a) Contains proteolytic substance used as food tenderizer.

    b) Mild stimulant that increases mental activities.

    c) Used in cancer therapy

18. a) Sister chromatids separate

    Sister chromatids moves to opposite poles (2mks)

    b) Separation of homologous chromosomes (1mk)

    c) During birth;

    - Through breastfeed (2mks)

19. a) It secretes the amniotic fluid (1mk)

    b)– Acts as shock absorber against mechanical shock.

    C) Connects the embryo and mother where exchange of substances occurs (1mk)

20. a) i) Photosynthesis

    ii) Respiration

21. a) $\frac{FC \times SC}{MR} = \frac{50 \times 50}{3}$ = 833 Crabs

    b) – The marked organisms freely internet with the other organisms

    - There is no entry of exit of crabs, into the pond.
    - The mark does not affect the behaviour of the crabs.
    - This mark does not make the crabs prone to predators.

22. – Provision of facilities such as toilets and pit latrines for safe and effective disposal of human wastes.

    - Provision of facilities such as dustbins and composite pits for the disposal of household wastes such as kitchen wastes and papers.

23. a) i) An increase in temperature increase the energy content (kinetic energy) in diffusing part times making them to move/diffuse faster.

    ii) A higher differences in centration between two regions increases the rate of diffusion.

    iii) The smaller the diffusingparticles the higher they move father hence faster diffusion.

    b) Diffusion occurs along a concentration gradient without utilization of energy while in active transport. Ions move against the concentration gradient with the utilization of energy.

24. a) Waterlogging lowers the concentration of oxygen in the soil; inhibiting active transport process required to uptake of the ions by the root hair cells; respiration process is inhibited.

    b) – Support in herbs

    - Closing and opening of stomata
    - Feeding in insect feeding plants (insectivorous plants)
    - Absorption of water from the soil.

25. i) They are numerous

- They are long (elongated)

    ii) Counter current flow system

    iii) Kidney /placenta

26. i) Continuous variation

    ii) – Skin colour

    - Height
    - Body weight (size)