1. (a) The study of cells; (1mark)

   (b) The study of microorganisms;

2. Secretion of enzyme that digests food externally;

   Absorption of water and nutrients;

3. (a) Not to destroy the cells; (1marks)

   (b) (i) Takes part in formation of spindle fibres during cell division; (1 mark)

   (ii) Controls all the activities of the cell

4. Is the movement of water molecules from a region of low concentration to region of high concentration through /across semi permeable membrane; Acc: Movement of water molecules/solvent from the region of their high concentration to the region of their low concentration through semi permeable membrane

5. (a) Regulates amount of light passing through the condenser (to illuminate the specimen) ;

   (b) Contracts and relaxes increasing and decreasing the volume of thoracic cavity respectively;

6. Hydrogen ions formed in the light stage combine with carbon (IV) oxide to form simple sugars; using energy from ATP;(2marks)

7. (a) Harbours bacteria that secrete cellulose enzyme that digests cellulose in the ruminant mammals; (1mark)

   (b) -Is where red blood cells are formed in infants/embryo;

   - Destroys, worn out red blood cells;

   -Stores iron which is used to make haemoglobin;

   -Makes white cells which destroy pathogens

8. (a) Gymnospermatophyta/gymnospermae;(1mark)

   (b) Presence of cone/bears cones; Needle –like leaves;

9.

Marginal placentation	Axile placentation
- Placenta positioned along the edge of the ovary/fruit;√	- Placenta positioned at the centre of the ovary/fruit;
- Fruit has only on chamber/loculus;	- Fruit divided into many chambers/loculi;

(2marks)

   (b) - Causes development of Grafian follicle in the ovary;

   -Stimulates ovary tissues to secrete hormone estrogen;

10. Immature/under developed embryo;

    Presence of growth inhibitors;

    Hard impermeable seed coat;

    Lack of growth hormone;

Low enzymatic activity; any first two

11. Plants –Ethanol carbon (IV) oxide, energy ;(1 mark)

    all the three must be correct/mentioned Animals

    –Lactic acid, energy; (1mark) all must be mentioned to score

12. –Long /feathery/hairy to increase surface area for trapping of pollen grains;

    -Hang outside the flower to trap pollen grains;

13. (a) Root; (1mark)

    (b) (i) Monocotyledonae; (1mark)

    (ii) -Vascular bundles alternate (around the pith);

    -Presence of pith; any one (1mark)

    (c) Phloem; (1mark)

14. Blood cells;

    Plasma protein

15. Age;

    Health status;

    Occupation/physical activity;

    sex;

16. Oil cuts off oxygen leading to death of larvae hence breaking the life cycle of mosquitoes

17. (a) Glycolysis; (1mark)

    (b) Pyruvic acid; (1mark)

18. (a) Gives raise to root hairs; (1mark)

    (b) To facilitate the movement of materials from the soil into the root; (1mark)

    (c) Diffusion; Active transport; Cytoplasmic streaming; any 1st one

19. (a) Amnion;

    (b) Highly folded; Thin walled; highly vascularized; any first two

    (c) Has blood vessels that transport substance to and from foetus; \

20.
    - Thin walled for faster diffusion of gases/shorten the diffusion distance of (diffusing)gases;
    - Highly vascularized/supplied with blood capillaries to transport (respiratory) gases;
    - Moist to dissolve gases (for easy diffusion);

21. (a) A –Stoma/stomatal pore;

    B-Vacuole/sup vacuole; Cell H: Epidermal cell; (3marks)

    (b) -Has thick inelastic inner walls which become turgid and draw a part leaving stoma/stomatal pore/A open;

-Has thin elastic wall that that makes it to bulge/stretch outward when it becomes turgid;

-Has numerous chloroplasts that contain chlorophyll for photosynthesis;

-Has a large sap vacuole to accommodate high amount of water and solutes that determine its osmotic pressure; any first two (2marks)

22. (a) To transport essential substances/oxygen/nutrients to various parts of the body;OWTTE and remove wastes from the cells/tissue/various parts of the body; OWTTE (2marks)

    (b) It has a large surface area to volume ratio; sufficient for exchange of materials

23. Self-sterility/ incompatibility; protogyny; protandry; monoecious plant/hermaphrodite; Any first three (3marks)

24. Inhibition of lateral bud development; by the terminal bud due to high concentration of auxins/plant hormones(that inhibit lateral bud development

25. (a) Insulin is secreted when blood sugar level is higher than normal; (1mark) (b) Ant-diuretic hormone is secreted when the osmotic pressure of blood is high;

26. (a) To show that oxygen is necessary for germination ; (1mark)

    (b) Flask A:-No germination since pyrogallic acid absorbed oxygen necessary for germination; (1mark)

    B: Germination occurred due to presence of oxygen ;

27. Help in recycling of nutrients; by breaking dead organic materials to simple inorganic substances(Acc CO2 ,NH_3 and mineral salts)

28. (a) Osmosis; (1mark)

    (b) Visking tubing swells/increases size/volume ;(1mark)

    (c) Sucrose solution is hypertonic to the distilled water; water molecules are drawn into the visking tubing by osmosis

29. a) Store their wastes in non-toxic forms in the leaves/flowers/fruits/barks that age and drop off from the plants;

    -Store in xylem tissue away from living cells;

    -Their accumulation is slow therefore low metabolic activity;

    -Some waste products are re-used in the same plant;

    -Exudes gums, resins and salts from the bark. Any first two (2 marks)

    (b) Long loop of Henle to increase surface area for reabsorption of water/conservation of water; few glomeruli to reduce ultrafiltration ;(

30. –Has rich network of blood capillaries/highly vascularized to transport(respiratory) gases;

    -Thin epithelium/wall to reduce diffusion distance;

    - Moist to dissolve (respiratory) gases;