KCSE 2013 Paper 1

4.4 BIOLOGY (231)

4.4.1 Biology Paper 1 (231/1)

1.(a) Is when the rate of water loss is more than the rate of absorption and the plant droops; 1 mark

(b) The rate of active transport increases with increase intemperature up to the optimum temperature; 1 mark

Further increase in temperature slows down the rate of active transport until it stops because it denatures enzymes; 1 mark

2.(a) Animal cell; 1 mark

(b) - Has cell membrane only/has no cell wall;
- Has numerous small vacuoles;
- Has central nucleus; Max. 2 marks

(c) Consists of many similar cells performing the same function; 1 mark

3.(a) Have mammary glands; have external ears/pinna;
Body covered with fur/hair; Max. 2 marks

(b) Class; 1 mark

4.(a) Lubrication; Protection; 2 marks

(b) Young people are more active; requiring more energy;/
Older people are less active; requiring less energy; 2 marks

5. As the cell gains water by osmosis; the sap/cellvacuole enlarges; pushing the cytoplasm outwards; exerting pressure on the cell wall; Any 3 3 marks

6. 6000(µm)
55 (cells) ; 109µm; 2 marks

7.(a) Water molecules cling to each other maintaining a continuous column of water/preventing the break of water column; 1 mark

(b) Water molecules cling to the sides of the xylem vessel walls; 1 mark

8. 1(a) - Leaf with serrated margin -- go to 2;
(b) - Leaf with smooth margin -- go to --; 2 marks

9. Presence of myelin sheath for insulation/increases transmission; Axon for transmission of impulses;
Large cell body controls activites of cell; Nerve endings/dendrites receives impulses from

receptors cells;
Node of Ranvier speeds up impulse transmission.

(b) Inner membrane highly folded/cristae to increase S A for attachment of (respiratory) enzymes.
4 marks

10. Cells loosely arranged; to facilitate air circulation;
Cells have moist surfaces; to dissolve respiratory gases;
2 marks

11. Can receive blood from any donor/ universal recepient; 1 mark

12. (a) (i) Arachnida; 1 mark
(ii) Spider/scorpion/tick/mite; 1 mark

(b) Protoctista/protista; 1 mark

13. Autotrophic nutrition; show alternation of generation;
Limited movement;
Limited excretory products/unspecialized respiratory structures;
Localised growth; 2 marks

14. Alcohol/ethanol; Carbon (IV) oxide; Energy/Adenosine Triphosphate; 3 marks

15. - To increase supply of oxygen to the tissues;
- The oxygen is used to oxidize lactic acid (to carbon (IV) oxide, water and energy);
2 marks

16. Protogyny; protandry; Dioecious; Dichogamy;
Self sterility/incompatibility; Heterostyly;
Presence of structures/substances to attract agents of pollination; Max. 3 marks

17. Ovary /Anther; 1 mark

18. - Acrosome/Lysosome contain enzyme to digest membrane of the ovum;
- Numerous mitochondria to provide energy for movement;
- Long tail for faster movement; Max. 2 marks

19. - Embryo not fully developed;
- Chemical inhibitors/presence of abscisic acid;
- Hard/impermeable testa/seed coat;
- Low hormones/low enzymes concentration; Max. 3 marks

20. Genetically acquired beneficial characteristics which occur spontaneously; are perpetuated through reproduction; 2 marks

21.(a) Continents existed as one large Landmass/Pangea/Laurasian and Gondwana Land;
Present continents drifted from it leading to isolation of organisms; organisms in each continent
evolved along different lines hence emergence of new species; 3 marks

(b) Emergence of new life/species/organisms from pre-existing simple forms, gradually over a long period of time, to present complex forms; 1 mark

22.(a) Thigmotropism/Haptotropism; 1 mark

(b) Part of the tendril in contact with support causes migration of auxins to the opposite side; leading to faster cell division/growth on the side not in contact with the support; This causes the tendril to curl around the support;

3 marks

23. Use of biconcave/concave lens/divergent lens; to diverge the rays and make image be focussed on the retina; 2 marks

24. - Contains antibodies that defend the body from foreign antigens;
- Has white blood cells that produce antibodies/while blood cells engulf antigens;
- Has platelets that initiate blood clotting to prevent excessive bleeding at an open wound/ prevent entry of pathogens;

3 marks

25. - Thin and long to allow for capillarity;
- Walls lignified to strengthen the stem/to prevent collapse of vessels;
- Have bordered pits to allow for exchange of materials;

Max. 2 marks

26.(a) Genes inherited along with the sex chromosomes; 1 mark

(b) Haemophilia; hairy ears/pinna/nose; colour blindness/red green; blue-green colour blindness; Muscular diastrophy; baldness

2 marks

27.(a) Complete metamorphosis - eggs hatch into larvae while in incomplete metamorphosis hatch into nymphs which resemble the adult;

Complete metamorphosis has four stages; egg, larvae, pupa and adult while an incomplete metamorphosis has three stages; egg, nymph and adult. 2 marks

(b) To allow for growth of the insect; 1 mark

28. (a) Ligaments; synovial fluid; synovial membrane; articular cartilage; synovial capsule; a bone with rounded head fitting into a cavity of another bone;

Max. 2 marks

(b) (i) Atlas; (ii) Axis allows movement in all planes; 2 marks

29. - Form joints with the legs to make walking possible; 1 mark
- Provide large surface area for attachment of muscles; 1 mark
- Offers support (to the body weight)

30. Absorption of water; support;
Opening and closing of stomata;
Feeding in insectivorous/plants; 2 marks