

2009 KCSE BIOLOGY PAPER 1 MARKING SCHEME

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1. (a) Scales; (1 mark)
- (b) - Cell wall is made of chitin or cellulose (Rej. Chitin alone)
 - Stores food in form of glycogen or oil droplets
 - Heterotrophic /no chlorophyll /chloroplast
 - Reproduce asexually by sporulation or sexually by conjugation most reproduce by sporulation (give 2 marks for the first two only) (2 marks)
2. Food; Shelter Rej. Protection or security Acc. Habitat (2 marks)
3. (a) Magnify and focus
 (b) Regulate /control amount of light (falling on object on microscope) (2 marks)
4. (a) (Seed) dormancy (1 mark)
- (b) (i) Epigeal (1 mark)
- (ii) Protection of the delicate plumule
 Pulls the cotyledons above the ground (2 marks)
5. (a) (i) Production of plants and animals that have greater productivity /beneficial ones than either parents (1 mark)
- (ii) Condition in which an individual has more than 2 complete sets of chromosomes (Rej. 3 or 4 orsets of chromosomes) (1 mark)
- (b) - Viruses such as papilloma
 - Radiations such as alpha, gamma, beta, UV rays /light, X-ray
 - Heavy metals such as lead or mercury
 - Increase in temperature /very high temperature
 - Chemicals such as colchicine, phenols, bromate, pesticides, cydamate
 (Rej. Mustard gas - causes gene mutation /Cosmic rays /Formaldehyde)
 (Accept: examples alone /reject points with no examples for radiation and chemicals)
 (give 2 marks for the first two) (2 marks)
6. (a) (i) Dicotyledonae (1 mark)
- (ii) - Vascular bundles arranged in a ring
 - Presence of vascular cambium (Rej. cambium alone. Rej. pith) (1 mark)
- (b) - Gives rise to new phloem and xylem
 - Gives rise to secondary thickening /increase in girth /width (1 mark)
7. (a) Protein synthesis (1 mark)
- (b) Breaks down worn out tissues /cells /organelles /food materials (Rej. eliminates, organs) (1 mark)

- (b) Abscisic acid (1 mark)
22. - Large airspaces (2 marks)
- Thin cell walls
23. (a) Canine (1 mark)
(b) Pointed/sharp for piercing/tearing/cutting food (1 mark)
- (c) (i) C - prevents degeneration of muscles and cartilages/prevents red spot in skin/maintenance of healthy cells/gums/promotes absorption of iron/prevents scurvy / quick healing of wounds / boost immunity/antioxidants/formation of connective tissue/prevents anaemia (1 mark)
(ii) K- Blood clotting
24. Light reaction - Grana/granum/thyllakoid (membrane)/lamellae (2 marks)
Dark reaction - Stroma
25. Bean Plant Dicotyledonae; leaves net veined/leaves with petioles/tap root system/cross section of stems showing vascular bundle arranged Reason - in a ring round pith/cross section of roots have star shaped xylem with phloem in between arms of xylem/floral parts in multiples in/two cotyledons.
Bat - Mammalia Reason - presence of fur/hair/mammary gland/presence of sweat glands/3 ear ossicles/ presence of diaphragm/2 pinnae (4 marks)
26. (a) Inducing polyploidy/cancer therapy/treatment gout (1 mark)
(b) Meat tenderizer (1 mark)
27. (Anaerobic) micro organisms/bacteria breakdown harmful substances in sewage. (1 mark)
28. (a) Budding (1 mark)
(b) Protandry - stamens/androecium/male parts mature before the carpels of a flower/anthers maturing before stigma.
protogyny - carpels/gynoeccium/pistil/female parts mature before the stamens of a flower (2 marks)
29. Cushions foetus against shock/mechanical damage/ provide a suitable medium for embryo to grow/allows movement of foetus/reduces friction /lubrication/ suspends foetus providing support (1 mark)
30. (a) Pelvic girdle/pubis bone/innominate bone (1 mark)
(b) (i) Femur;
(ii) Obturator/ foramen (1 mark)

8. (a) The placenta; takes over the role of the ovary of producing the hormone progesterone
(Accept. Progesterone and oestrogen)
(Rej. Oestrogen alone) (2 marks)
- (b) Production of sperms /male gametes /male sex cells
Production of testosterone /androgen /male sex hormones (2 marks)
9. (a) (i) Salmonella typhi (first word should start with capital letter)
(ignore: failure to underline and spelling mistake of //) (2 marks)
- (ii) Entamoeba histolytica (2 marks)
- (b) Malaria (1 mark)
10. (a) (i) Structures that have ceased to be functional over a long period of time and hence reduced in size (1 mark)
- (ii) - Caecum and appendix
- Coccyx
- Nictating membrane (semi-lunar fold in corner of eye)
- Tail
- Ear muscles
- Body hair (give 1 mark for th first one) (1 mark)
- (b) Disease causing organisms mutate; and become resistant (2 marks)
11. (a) The auxillary buds /will sprout /grow /is produced /lateral buds (1 mark)
- (b) Decapitation removes the hormone /auxins / IAA which is produced in terminal bud /the stem tip; Absence /removal of the hormone /auxins /IAA promoting branching / development of auxillary buds /lateral buds; (2 marks)
12. (a) Scapula (1 mark)
- (b) (i) Humerus aca humerous Rej. Humourous (1 mark)
- (ii) Ball and socket joints
Rej. Ball and socket joint / Socket and ball joints / bail and socket bone (1 mark)
- (c) Attachment of muscles
Rej. Attachment of tendons (1 mark)
13. (a) In diffusion molecules move from a highly concentrated region /along a concentration gradient to a lowly concentrated region while in active transport molecules move against a concentrated region / from a lowly concentrated region to a highly concentrated region; No energy is required in diffusion while energy is required in active transport (2 marks)

- (b) (i) - Support due to turgidity
 - Feeding in insectivorous plants
 - Absorption of water from the soil by root hairs /movement of water between plant cells /opening and closing of stomata (1 mark)
- (ii) - Reabsorption of water by blood capillaries from renal tubules
 - Absorption of water in colon /gut /alimentary canal
 - Movement of water from one animal cell to another (1 mark)
14. Parenchyma ; Collenchyma (1 mark)
15. Cytoplasmic streaming /Cyclosis (1 mark)
16. (a) Tracheoles; Rej. Trachea and Tracheole system (1 mark)
- (b) Moist for gases to dissolve
 Thin for fast diffusion
 Branched / many /numerous tubes to increase SA (for GA)
 (Rej. (b) if (a) is wrong)
 (Accept. (b) answer if trachea system is given for (a) (2 marks)
17. (a) - Some waste products are stored in soluble form in dead tissues
 - Waste products mainly made from carbohydrates and hence not harmful
 - Little accumulation of wastes /plants are less active
 - Some waste products are stored in non-toxic form in leaves /buds
 - Some waste products are reusable /recycled e.g. O₂, CO₂
 - Some waste products are removed by diffusion (1 mark)
18. (a) Rate of photosynthesis increases as the CO₂ concentration increase up to optimum level;
 Rate of photosynthesis reduces as CO₂ concentration decrease until it stops; (1 mark)
- (b) Rate of photosynthesis increases as the light intensity increase up to optimum level; (1 mark)
19. (a) Kills organisms in water /produces O₂ in water
 - Causes water borne diseases e.g. cholera, dysentery and typhoid
 - Interferes with the food chain /trophic levels
 - Leads to eutrophication; Rej. algae bloom
 - Reduces quality of water for consumption /change H₂O pH (3 marks)
- (b) Respiration / Defecation / Excretion (1 mark)
20. Bell transect /line transect Rej. Belt line or Transect line (2 marks)
21. - Pancreas release glucagon; hence glycogen is converted to glucose
 - Fats is converted to glucose; reduces rate of respiration Rej. Metabolism for respiration (4 marks)

22. - Large and powerful for cracking /breaking /crushing bone
 - Slide past each other /scissor like for shearing off flesh / tendons /skin from bone (1 mark)
23. A component of haemoglobin
 Accept. Myoglobin
 Rej. Iron as a co-factor or co-enzyme (1 mark)
24. (a) Young people are actively growing hence require more energy than older people
 Rej. glowing (1 mark)
- (b) Manual workers require more energy than sedentary workers
 Rej. Casual workers /labourers (1 mark)
- (c) Males are more muscular hence require more energy than females (1 mark)
25. - Thin walled /membranes for easy diffusion of gases
 - Store alot of air /large air spaces for increased buoyancy /gA (2 marks)
26. Inner membrane is highly folded /have cristae to provide a larger SA; for attachment of muscles
 (Rej. Cristae are folded or coiled) (2 marks)
27. - Baking; formation of dairy products /e.g cheese, yoghurt, sour milk (Rej. butter /ghee /
 cream / milk fermentation)
 - Brewing; production of organic acid e.g. Oxalic, citric, acids vinegar, butyric acid /lactic acid (2 marks)
28. (a)
- | Arteries | Veins |
|------------------------|----------------------------------|
| - Thick muscular walls | - Thin and (less) muscular walls |
| - No valves | - Valves present |
| - Narrow lumen | - Wide lumen |
- (3 marks)
- (b) Arteriosclerosis Rej. Antheroma (1 mark)
29. - When humidity is high the air around the leaf gets saturated with water vapour hence less space for water vapour from leaf to occupy
 - Low saturation /low diffusion gradient difference between concentration of water vapour in atmosphere and air spaces is greatly reduced (1 mark)