
KENYA NATIONAL EXAMINATION COUNCIL

KCSE 2007

BIOLOGY PAPER 1 MARKING SCHEME

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Biology Paper 1

1. (a) A Scientific system of naming organisms using the generic and specific species names. (1 mark)
- (b)
- Placing/grouping of living organisms into correct groups/ taxa; identification.
 - Arrange information about living organisms into orderly and sequential manner.
 - Easy to study organisms according to groups.
 - Helps in the understanding of evolutionary relationships.
 - Monitoring the disappearance and appearance of organisms/ predict the characteristics of organisms. (2 marks)
2. (a) $\text{Magnification} = \frac{\text{Length of drawn object / specimen}}{\text{Length of the actual object / specimen}}$ (1 mark)
- (b) To make parts of specimens distinct /clear. (1 mark)
3. Presence of cell wall; which is rigid/ doesn't stretch/ is tough. (2 marks)
- 4.
- Secretion of substances/ hormones/ enzymes /glycoproteins /polysaccharides / synthesized proteins/ carbohydrates.
 - Packaging of carbohydrates and proteins.
 - Modification of carbohydrates and proteins/ formation of glycoprotein.
 - Transport of carbohydrates/ proteins/ glycoproteins /lipids.
 - Production of lysosomes. (3 marks)
5. **Diffusion:** Movement of substances from a region of high concentration to a region of low concentration (until equilibrium is reached). (1 mark)
- Osmosis:-** Movement of water or solvent molecules from a dilute / hypotonic solution to a more concentrated/ hypertonic solution across a semi-permeable membrane; (1 mark)
6. Light (energy) is absorbed by chlorophyll; photolysis the light splits water molecule; to form Hydrogen atom/ions and Oxygen gas. Light is converted to form Adenosine Triphosphate (ATP). (3 marks)
7. (a) (i) Premolar/ molar.
- (ii) Has two (2) roots/broad working surface/cups/ridges. (2 marks)
- (b)
- Blood vessels/capillaries which supply oxygen/nutrients/move carbon dioxide/waste products.
 - Nerve endings for sensitivity. (2 marks)
8. (a) Vitamin D/ Calciferol; (1 mark)
- (b)
- Nerve impulse conduction.
 - Muscle contraction.
 - Helps maintain osmotic/anion – cation balance in cells.
 - Assists in active transport; needed in protein synthesis; in respiration. (2 marks)
- 9.
- The root hairs are long/ narrow/ numerous to increase the surface area for absorption of water/ mineral salts.

- Many mitochondria (in cytoplasm) to supply energy for active transport of mineral salts/ thin walls to speed rate of absorption of water/mineral salts. (2 marks)
10. (a) Phloem. (1 mark)
- (b) K - Phloem/ parenchyma cell. (1 mark)
- L - Sieve tube element/sieve tube (cell). (2 marks)
- (c)
- Supply of nutrients to sieve tube element for translocation.
 - Regulates the activities of the sieve tube cell / sieve element. (1 mark)
11. (a) Valves (1 mark)
- (b)
- Biconcave shaped to provide a large surface area for absorption of Oxygen/CO₂.
 - Absence of nucleus hence more haemoglobin to carry sufficient Oxygen/CO₂. (2 marks)
12. (a) Stomata; pneumatophores. (2 marks)
- (b) Diaphragm flattens; increasing volume of chest cavity; while pressure decreases. (3 marks)
13. (a) (i) (Ethanol/ Ethyl alcohol) Carbon (IV) oxide, Energy (210KJ). (1 mark)
- (ii) Lactic Acid, Energy. (1 mark)
14. (a) (i) **Homeostasis:** maintenance of a constant internal environment. (1 mark)
- (ii) **Osmoregulation:** mechanisms which regulate osmotic pressure of internal environment of an organism/regulation of water and solutes/salt balance of the internal environment of an organism in the body. (1 mark)
- (b) Insulin. (2 marks)
- Glucagon.
15. (a) **Population:** the number of organisms of a species occupying a given habitat. (1 mark)
- Community:** Population of different species of plant and animals organisms/in a given area/habitat/co-exist/living/interacting with each other. (1 mark)
- (b) (i) Capture – recapture/total count. (1 mark)
- (ii) Line transect/ Belt transect/ quadrant. (1 mark)
- 16.
- The eggs have a hook-like structure which ruptures walls of intestines or bladder.
 - It lays large number of eggs to ensure survival.
 - The larva has a sucker for attachment on human skin which it digests.
 - Larva has a tail for swimming on each of a host in water.
 - It has a prolonged association between male and female to ensure that fertilization takes place.
 - Adult tolerates low (O₂).
 - Adult secretes chemicals against antibodies of host.
 - Larva encysted to survive adverse conditions.
 - Larva/egg secretes high enzymes which softens tissue for ease of penetration. (2 marks)
17. (a) (i) Anaphase I. (1 mark)
- (ii)
- Centromere of bivalent pair not split.

- Homologous chromosomes separate; are moving towards poles of the cell. (2 marks)
 - (b) Spindle fibre(s). (1 mark)
- 18.
- Offspring can inherit undesirable characteristics from parents.
 - Sexual reproduction takes a long time.
 - Fewer offspring are produced.
 - Involves two different sexes (which must mate). (2 marks)
- 19.
- (a) Low temperature; light (O_2); water/ water moisture. (2 marks)
 - (b) Hypocotyl. (1 mark)
- 20.
- (a) Allele refers to alternative form of a gene; one of two or more alternative states of a gene of two or more states of a gene. (1 mark)
 - (b) (i) **Deletion:** Some bases nucleotides of a gene reversed. (1 mark)
 - (ii) **Inversion:** The order of some bases nucleotides of a gene reversed (1 mark)
 - (c) A cross made between a homozygous recessive parent and a parent of unknown genotype (to determine whether the unknown type is homozygous or heterozygous for a dominant gene). (1 mark)
- 21.
- (a) A situation where organisms have a homologous structure; which is modified to perform different functions; so as to grow to different ecological niches/habitat. (1 mark)
 - (b) The organisms mutate. (1 mark)
- 22.
- (a) Brain/Spinal cords/Central nervous system. (1 mark)
 - (b) (i) Motor. (1 mark)
 - (ii) P: Dendrites.
Q: Axon / Axoplasm. (2 marks)
- 23.
- (a) Indole Acetic Acid. (1 mark)
 - (b) Growth response of part of a plant when in contact with an object. (1 mark)
- 24.
- (a) Vertebrarterial canal. (1 mark)
 - (b)
 - Collenchyma.
 - Sclerenchyma.
 - Xyllem/trancheid and vessels. (2 marks)
- 25.
- (a) Acidic medium due to presence of hydrochloric acid. (1 mark)
 - (b) High temperature, extreme (changes) pH. (1 mark)
 - (c) Increased presence of villi; coiled. (2 marks)
- 26.
- Time of birth.
 - Breast feeding. (1 mark)