

BIOLOGY 2016

PAPER 1

No.1.(a) State two ways in which the muscles of the mammalian heart are special. (2 marks)

- ❖ *Muscles are myogenic - able to initiate their own contraction.*
- ❖ *Presence of intercalated discs hence interconnected.*
- ❖ *Can contract continuously without fatigue.*

(b) Name the type of muscles found in the following organs. (2 marks)
Stomach.....

Bone

- ❖ **Stomach** - Visceral muscles/ smooth muscle.
- ❖ **Bone** - Skeletal muscles

No. 2. Why are plants able to accumulate most of their waste products for long? (1 mark)

- ❖ *Most of the waste products are harmless;*
- ❖ *Waste products are converted into harmless products;*

No. 3. State the important of tactic response among some members of the kingdom protista. (2 marks)

- ❖ *Move towards favorable environment; accept converse*

4. (a) Name one defect of the circulatory system in humans. (1 mark)

- ❖ *Thrombosis/ Varicose veins/ Arterion sclerosis/ Antheroma*
- ❖ *Antherosclerosis*
- ❖ *Accept cerebral vascular thrombosis*

(b) State three functions of blood other than transport. (3 marks)

- ❖ *Regulation of the body temperature*
- ❖ *Regulation of pH of fluids*
- ❖ *Defense against disease – causing organism/ pathogens/ infection.*
- ❖ *Prevent excessive bleeding by enhancing clotting/ prevent excessive loss of blood*

No. 5. State the economic importance of anaerobic respiration in plants. (2 marks)

- ❖ *Brewing of alcohol accept examples;*
- ❖ *Baking of bread.*
- ❖ *Biogas production*
- ❖ *Compost manure formation*
- ❖ *Silage formation*
- ❖ *Commercial production of citric acid*
- ❖ *Sewage treatment.*

No.6. Explain continental drift as an evidence of evolution. (3 marks)

- ❖ *Current continents existed as one large land mass/ Pa.gea/ Laurentia Gondwanaland; the present continents drifted leading to isolation of organisms. Organisms in each continent evolved along different lines hence emergence of new species,*



No. 7.(a) Explain how the following prevent self-pollination.

(i) Protandry (1 mark)

- ❖ Male reproduction organ/ anthers androecia/ stamens mature earlier than female reproduction organ/ carpels/ stigma/ pistil/ gynoecium.

(ii) Self- sterility.

- ❖ Pollen grains are sterile to stigma of some plants/ flowers

No. 8.State three functions of Golgi apparatus.(3 marks)

- ❖ Form vesicles that transport materials to other parts of the cell e.g. proteins.
- ❖ Transportation secretions to the cell surface for secretion e.g. enzymes and mucus. Packaging of materials such as glycoproteins.
- ❖ They form lysosomes

No. 9.(a) Name two structures for gaseous exchange in aquatic plants. (2 marks)

- ❖ Pneumatophores
- ❖ Aerenchyma tissues
- ❖ Cuticle

(b) What is the effect of contraction of the diaphragm muscles during breathing in mammals? (3 marks)

- ❖ Leads to the flattening of the diaphragm. This increases the volume of the ribcage and lowers pressure inside compared to atmospheric pressure leading to respiration

No. 10.(a) State two disadvantages of sexual reproduction in animals. (2 marks)

- ❖ Harmful characteristics from the parents may be passed on the offsprings
- ❖ Takes a longer time
- ❖ Few offsprings are produced at a time

(b) State two functions of the placenta in mammals. (2 marks)

- ❖ Exchange of nutrients / oxygen / metabolic wastes between the mother and foetus circulation systems.
- ❖ Secretion of progesterone hormones

No. 11.Name two benefits that a parasite derives from the host (2 marks)

- ❖ Obtains food/ nutrients
- ❖ Shelter

No. 12.Other than using the quadrant, give two methods of estimating population of grass.(2 marks)

- ❖ Belt transect
- ❖ Line transects

No. 13.(a) State two factors that affect enzymatic activities (2 marks)

- ❖ Temperature PH co- factors, co- enzymes; enzyme product concentration; substance concentration/ metabolic poison



(b) Explain how one of the factors stated in (a) above affects enzyme activities. (1 mark)

- ❖ *Temperature- increase in temperature increases rate of enzymatic activity up to an optimum*
- ❖ *Low temperature decreases enzymatic activity/ too high temp above optimum point denatures enzymes.*
- ❖ *Ph- Enzymes work best at optimum ph/ extreme ph denatures enzymes.*
- ❖ *Enzyme conc – Increase in conc. increase enzymatic activity.*
- ❖ *Co- enzymes – complements enzymes increasing rate of activity*
- ❖ *Substrate concentration increase enzymatic activity up to certain level.*

No. 14. Give three factors that determine the amount of energy a human being requires in a day. (3 marks)

- ❖ *Body size*
- ❖ *Sex*
- ❖ *Age*

No. 15. (a) What is seed dormancy (1 mark)

- ❖ *State during which a seed cannot germinate/ state of rest before seed germination; re: inability to germinate*

(b) Name a growth inhibitor in seeds (1 mark)

- ❖ *Abscisic acid*

No. 16. State one use of each of the following excretory products of plants: (2 marks)

(a) colchicine

- ❖ *Inducing polyploidy/ treatment*

(b) papain

- ❖ *Meat tenderizer*

17. State the name given to the study of:-

(i) The cell (1 mark)

- ❖ *Cytology: Re: cell biology*

(ii) Micro-organisms (1 mark)

- ❖ *Microbiology*

No. 18. Distinguish between haemolysis and plasmolysis. (2 marks)

- ❖ *Haemolysis – process by which red blood cells take in water till they burst; while Plasmolysis – loss of water from plant cells until the cell membrane is detached from the cell wall/ until the cell become flaccid.*

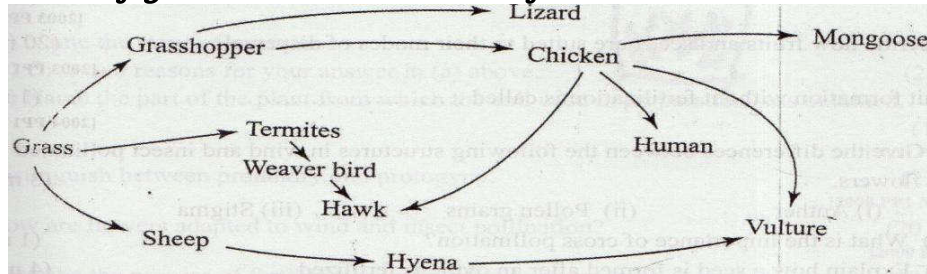
19. Explain why it is not advisable to be in a poorly ventilated room with a burning charcoal stove. (3 marks)

- ❖ *Charcoal in limited supply of air produces carbon(ii) oxide, which combines with haemoglobin forming Carboxylhaemoglobin which is a stable compound and does not dissociate easily, reducing capacity of the haemoglobin to carry oxygen leading to suffocation hence death*

No. 20. State three factors that contribute to the deceleration population curve of an organism. (3 marks)

- ❖ Overcrowding
- ❖ Accumulation of toxic wastes
- ❖ Limited resources such as nutrients

No. 21. The figure below illustrates a food web in a certain ecosystem.



From the food web:

(a) Draw the shortest food chain; (1 mark)

- ❖ Grass → grasshopper → lizards

b) Identify the organisms with the highest

(i) Number of predators; (1 mark)

- ❖ Chicken

(ii) Biomass. (1 mark)

- ❖ Grass

No. 22. State three characteristics of the class Crustacea. (3 marks)

- ❖ Fused head and thorax/ caphalothorax (often) protected by carapace.
- ❖ Gaseous exchange through gills
- ❖ Two pairs of antennae
- ❖ Five more pairs of limbs/ five to twenty pairs of limbs; **rej** five
- ❖ A pair of compound eyes
- ❖ Three pairs of mouth parts (consisting of labial pulps / maxillae/ mandible)

No. 23. (a) Name one salivary gland in humans. (1 mark)

- ❖ Sublingual; submaxillary/ submandibular; parotid

(b) State two functions of saliva (2 marks)

- ❖ Lubricating food; Digestion of starch; Moistens food; Provides alkaline medium;
- ❖ Softens food/ Dissolves food.

No. 24. How does nutrition as a characteristic of living organisms differ in plants and animals? (2 marks)

- ❖ Plants make their own food from carbon (IV) oxide and water in the presence of light / photosynthesize/ autotrophic; while animals eat readymade food (some plants and animals heterotrophic);
- ❖ If photosynthesis described all raw materials must be mentioned;
- ❖ Carbon (IV) oxide the (IV) must be bracketed.
- ❖ If sources of food for animals are mentioned then both plants and animals must appear.

No. 25. Distinguish between diffusion and osmosis. (2 marks)

- Diffusion	- Osmosis
- Involves movement of particles of molecules of liquids or gas	- Involves movements of solvent molecules
- It may be through a membrane or in air	- It takes place through a semi permeable membrane
- Not affected by PH changes	- Rate affected by PH changes

No. 26. State the functions of the following parts of a light microscope. (2 marks)

(a) Objective lens

❖ Magnification of the object/ image

(b) Diaphragm

❖ Regulates amount of light (falling on the object on microscope); Acc: Adjust control amount of light

27. (a) What is single circulatory system? (1 mark)

❖ Blood goes through the heart once in very complete circulation

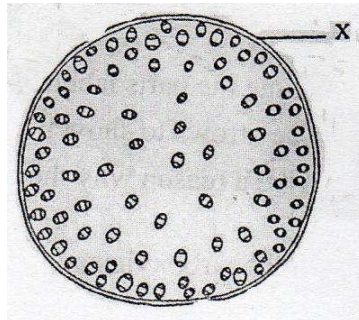
(b) Name an organism which has a single circulatory system. (1 mark)

❖ Fish

(c) Name the opening to the chamber of the heart of an insect. (1 mark)

❖ Ostium

No. 28. The diagram below shows a transverse section of a plant organ



(a) Name the plant organ from which the section was obtained

❖ Stem

(b) (i) Name the class to which the plant organ was obtained. (1 mark)

❖ Monocotyledonae

(ii) Give a reason for your answer in (b) (i) above. (1 mark)

❖ Vascular bundles are scattered and not arranged in a ring

❖ Absence of pith/ cambium

(c) Name the part labeled X (1 mark)

❖ Epidermis



No. 29(a). State a characteristic that is common to all cervical (1 mark)

- ❖ *Have short neural spines*

No. 29(b). Name two tissues in plants that provide mechanical support (2 marks)

- ❖ *Xylem tissues*
- ❖ *Collenchyma tissues*
- ❖ *Sclerenchyma tissues*
- ❖ *Parenchyma tissues*

No. 30. State two advantages of hybrid vigour (2 marks)

- ❖ *Resistance to pests/disease/adverse weather conditions*
- ❖ *Increase yield*
- ❖ *Earlier maturity/early maturity*