

# 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 enzymatic 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)**

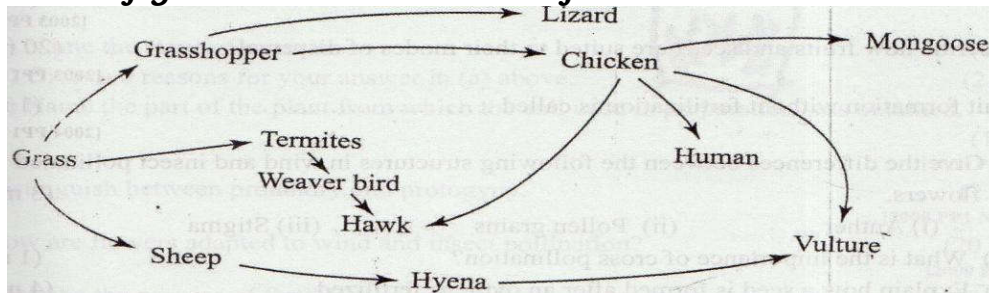
- ❖ *Charcoal in limited supply of air produces carbon(ii) oxide, which combines with haemoglobin forming Carboxylhaemoglobin which is a stable compound and does not dissociate easily, reducing capacity of the haemoglobin to carry oxygen leading to suffocation hence death*



**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/ capholothorax (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)**

- <b>Diffusion</b>	- <b>Osmosis</b>
- 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

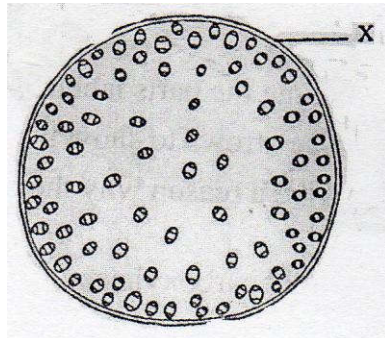
**(b) Name an organism which has a single circulatory system. (1 mark)**

❖ 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*