

**BIOLOGY FORM ONE**  
**MARKING SCHEME**

1. Name the branch of biology involved in the study of
  - a. Relationships of living with each other and their environment.(1mrk)  
Ecology
  - b. Identification and classification of organisms.(1mrk)  
Taxonomy
2. The binomial name of housefly is MUSCA DOMESTICA.
  - i) State two mistakes in the way the scientific name is written. (2mks)  
Species name written in capital letters;  
Two names are not underlined; (separately)
  - ii) Re-write the name in correct manner following the rules of binomial nomenclature. (1mrk.)  
Muscadomestica
4. State the use of each of the following apparatus: (3mrks)
  - i) Bait trap– for attracting and trapping small animals;
  - ii) Specimen bottle - for keeping / storing collected specimen;
  - iii) Pitfalltrap - for catching crawling animals;
5. Give the functions of the following parts in a light microscope.(5mrks)
  - a. Diaphragm Regulates the amount of light that is allowed to pass through the specimen.
  - b. Condenser (light director)  
Concentrates light before it passes through the specimen.
  - c. Objective lens brings image into focus and magnifies it.

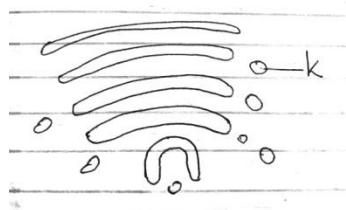
6. b) Why is it not likely to use an electron microscope in a school laboratory?

2mks

Specimen illuminated with a beam of electrons .Uses electromagnetic lenses

Stains used are made from heavy metals such as lead that are expensive

7. Study the diagram below and answer the questions that follow:



(a) Identify the organelle.

1mk

Golgi bodies/apparatus

(b) Name the structure labelled K

1mk

Secretory vesicles

c) State two functions of the organelle named in (a) above. 2mks

Packaging and transport of glycoproteins

Involved in secretion of synthesized proteins and carbohydrates.

Involved in the formation of lysosomes.

8. (i) What is the importance of carrying out the following procedures when preparing temporary slides in the laboratory?

(3mks).

(a). Adding water to the specimen.

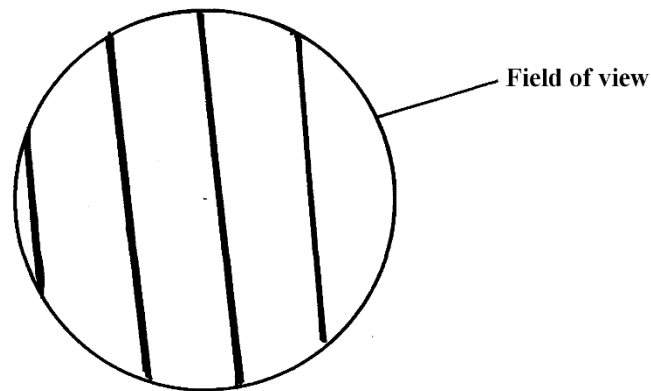
To maintain turgidity of cells

(b).Staining the specimen. Making parts distinct

(c). Using a sharp blade to make sections.to avoid distortion of cell structures

(ii) A student estimating a cell size of an onion epidermal cells observed the following on

The microscope field of view using a transparent ruler.



The student identified 20 cells across the field of view. Calculate the size of the cell inMicrometers (show your working)

(3mks)

Field of view = 4mm

Field of view in micrometers = 4 x 1000 = 4000 um;

$$\text{Size of cell} = \frac{\text{Field of view}}{\text{Number of cells}}$$

$$= \frac{4000}{20} ; = 200\text{Um};$$

10. Define the term physiology (2mrk)

The study of the functions of the different parts of the cell.

(a) Name the principal components of cell membrane (3mrks)

Two protein layers, phospholipid layer and pores.

(b)(i) Why would a cell allow some substances to pass through it but not others? (1mrks)

Has pores.

(ii) Other than the property of semi-permeability stated in b (i) above, state two other properties of a cell membrane (2mrks)

Sensitivity to changes in temperatures and PH.

Possesses electrical charges

Explain what would happen to the red blood cells if placed in concentrated salt solution.

3mks

The solution is hypertonic to the red blood cell cytoplasm; water molecules will move from red blood cells by osmosis; the red blood cell will become crenated;

11. Define the following terms (6mrks)

a. Isotonic solution

The solutions of equal concentration and are separated by a semi-permeable membrane

b. Hypotonic solution

This is where the solution has a lower concentration of solutes and high concentration of water molecules than the cytoplasm of a cell.

c. Hypertonic solution

This is where the solution has a higher concentration of solutes and low concentration of water molecules than the cytoplasm of a cell.

12. What is meant by the following biological terms?

(i) Crenation (2mk)

Shrinking of red blood cells/ animal cells as a result of water loss by osmosis (when placed in hypertonic solution);

ii) Haemolysis (2mk)

Bursting of red blood cells as a result of uptake of water by osmosis (when placed in hypotonic solution);

13. What role does osmosis play in plants?(2mks)

- a. Uptake of water by the plants from the soil;
- b. Maintain turgidity of cells by herbaceous plants;
- c. Opening and closing of stomata;

14. Distinguish between diffusion and active transport (2mks)

- a. In diffusion substances move from a highly conc. Region to a lowly conc. Region while in active transport molecules move from a lowly concentration region to a highly conc. Region .
- b. Diffusion molecules move along conc. Gradient while in active transport molecules move against conc. Gradient.
- c. No energy is required in diffusion while energy is required in active transport
- d. Active transport requires carrier molecules while carrier molecule not required in diffusion

15. Define the term nutrition (2 marks)

Process by which living things obtain and utilize food substances.

16. Name and explain the two types of nutrition (4 marks)

**Autotrophic nutrition.** This is where a living organism manufactures its own complex food substances from simple substances such as carbon (iv) oxide, water, light or chemical energy.

**Heterotrophic nutrition.** This is where organisms take in complex food materials such as carbohydrates, proteins and fats obtained from bodies of plants and animals.

17. Draw a well-labelled diagram of a leaf showing the external features. (3 marks)

Drawing = 1 mark

Labelling two parts = 2 marks

18. Differentiate between Chemotropism and Phototropism (4 marks).

Chemotropism is where organisms called chemotrophs make their own food using energy from special types of chemical reactions. In phototropism, the organisms use carbon (iv) oxide, water and energy from the sun to make their own food.

19. Define the term photosynthesis (2 marks)

This is the manufacture of food materials using light energy from the sun. It mostly takes place in green plants.

20. What four conditions are needed for photosynthesis to occur? (4 marks)

Water

Carbon (iv) oxide

Light

Chlorophyll

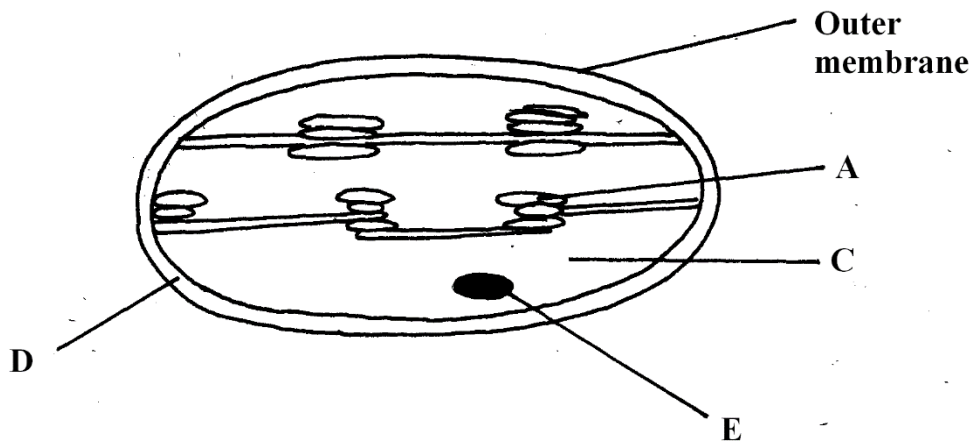
21. What is the importance of photosynthesis in nature?(2mrks)

Replaces oxygen in air which is continuously used up by all living things for respiration.

Photosynthesis uses carbon IV oxide from the air and incorporates it into carbon found in food substances.

Plants make their own food and animals depend directly or indirectly on plants for their food. Food contains energy from the sun stored as chemical energy.

22. The organelle below is important in the process of Nutrition.



a) Identify the organelle.

(1mk)

Chloroplast;

b) Name the part labeled

(2mk

A Granum

C Stroma;

23. Name the part where the following stages of photosynthesis occur(2mrks)

Light independent stage Granum

Dark stage the stroma

24. State the role of light in the processes of photosynthesis(1mrk)

Used to split up water molecules into hydrogen ions and oxygen atoms

25. Name the building blocks of ;(3mrks)

(I) proteins amino acids

(ii) Carbohydrates monosaccharides

(iii) Lipids fatty acids and glycerol.

26. What are enzymes?(2mrks)

Organic catalyst which are protein in nature

27. State the main properties of enzymes (2mrks)

Enzymes are protein in nature. They are therefore affected by temperature and PH.

Enzymes are substrate-specific.

Enzymes are efficient in small amounts since they are not affected by the reactions they catalyze. They can be used again and again.

Enzymes are catalysts that speed up the rate of cellular reactions. They are not used up in the reactions they catalyze.

Many of the enzyme-catalyzed reactions are reversible.