

# BIOLOGY PAPER 1 (231/1)

## MARKING SCHEME

1. State the significance of the following characteristics of living organisms. (2marks)

i. Irritability

- Enabled an organism to move away from hostile environment/unfavorable stimuli.
- Enables an organism detect changes in their environment.

ii. Reproduction

- Ensures continuity of the species (organism).

2. The scientific name *lantana camara* refers to a green herbaceous plant. Other related plants include *lantana trifoliata* and *vitex trifoliata*. From the list, identify the plants belonging to the same genus. (2marks)

Lantana camara ;

Lantana trifoliata ; underline separately ;

3. Which cell organelle will be abundant in: (2marks)

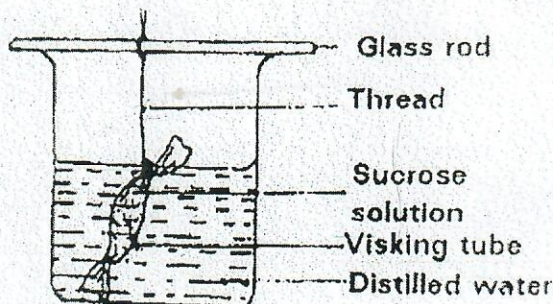
i. Skeletal muscle cell

- Mitochondrion ;

ii. Palisade cell

- Chloroplast ;

4. An experiment was set up as shown below. The set up was left for 30 minutes.



i. State the observations made after 30 minutes. (1mark)

- Visking tubing became swollen/increased in size/volume ;

ii. Explain the observations made in (i) above. (3marks)

- Distilled water is hypotonic ; while sucrose solution is hypertonic ; Distilled water moved through the semipermeable Visking tubing through the process of osmosis ;



5. The diagram below represents a section through a human tooth



(a) (i) Name the type of tooth shown (1 mark)

- Premolar

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

- Has two roots / presence of two roots

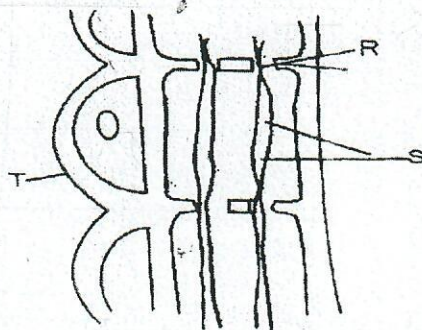
(b) State the functions of the structures found in part labeled J (2 marks)

i. - Nerves endings - Detect heat, cold and pain.  
 ii. - Blood Capillaries - provides nutrients & oxygen to the living tissues of the dentine and removes waste products.

6. Describe what happens during the light stage of photosynthesis (3 marks)

- Chlorophyll molecules absorb light energy which is used to split water molecules into oxygen atoms and hydrogen ions; a process called photolysis.

7. The diagram below represents part of the phloem tissue.





a. Name the structures labeled R, S and a cell labeled T

(3marks)

R... Sieve pore/plate;

S... Cytoplasmic strands;

Cell T... Companion Cell;

b. State the function of the structure labeled S.

(1mark)

Translocation;

8. a) What prevents blood in veins from flowing backwards?

(1mark)

Valves;

b) State two ways in which the red blood cells are adapted to their functions.

(2marks)

- Lacks a nucleus to create room for packing more haemoglobin
- Contains haemoglobin which has a high affinity for oxygen.
- Contains enzyme carbonic anhydrase that ensures transportation of  $\text{CO}_2$

9. Differentiate between Active immunity and Passive immunity.

(2marks)

- Active immunity - Is the form of acquired immunity in which the body produces its own antibodies against infections while passive immunity - Is the form of acquired immunity in which an individual is protected against infection by receiving antibodies.

10. State three gaseous exchange structures in terrestrial plants.

(3marks)

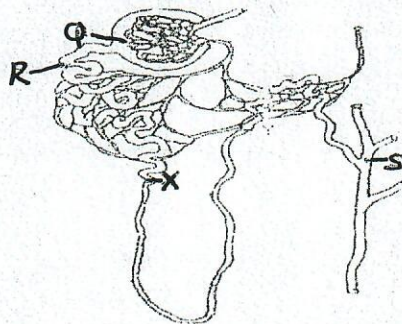
- Stomata;
- Lenticels;
- Pneumatophores;

11. Give two reasons why accumulation of lactic acid during vigorous exercise leads to an increase in heart beat.

(2marks)

- Lactic acid is toxic to tissues and must be removed from muscles to livers;
- To increase supply of oxygen to tissues;

12. The diagram below illustrates part of a Nephron from a mammalian kidney.





a. Name the fluid in the part labeled Q (1mark)

Glomerular ~~filtrate~~ filtrate;

b. Identify the process responsible for the formation of the fluid named in (a) above. (1mark)

Ultrafiltration;

c. Which two hormones exert their effects in the Nephron? (2marks)

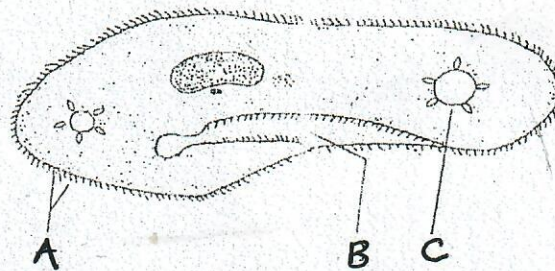
- Antidiuretic hormone (ADH);  
- Aldosterone;

13. Give one economic importance of the following plant excretory product. (1mark)

i. Tannins

- Treatment of leather;  
- sprinkled on red hot pots to give them attractive colour patterns;

14. The diagram below represents a living organism.



a. Name the structures labeled A and C (2marks)

A. Cilia

C. Contractile Vacuole

b. Identify the kingdom of the above organism. (1mark)

Protoctista

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

- Unicellular organism.

- Single-celled with a membrane bound nucleus and several other membrane bound organelles.



15. Name the phylum, whose members possess a notochord.

(1 mark)

Chordata;

16. Define the following terms;

(3 marks)

i. Ecological niche

The position that an organism occupies in a habitat;

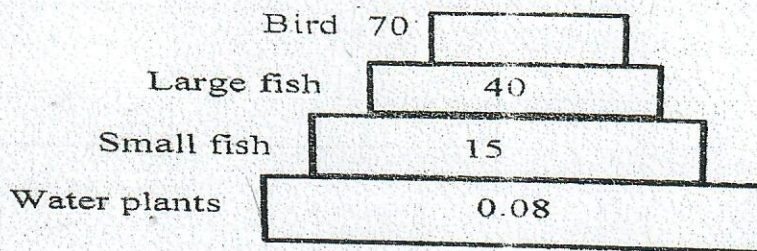
ii. Habitat

A specific locality with a particular set of conditions where an organism lives;

iii. Carrying capacity

The maximum number of organisms an area can comfortably support, without depletion of the available resources;

17. The figure below shows the amount of DDT at different levels in a food chain in a lake.



a. At what trophic level is DDT most likely to have the highest marked effect?

(1 mark)

Tertiary Consumers;

b. Suggest two ways in which the birds might have come into contact with DDT

(2 marks)

- Through feeding on both type of fish.  
- Through taking water.

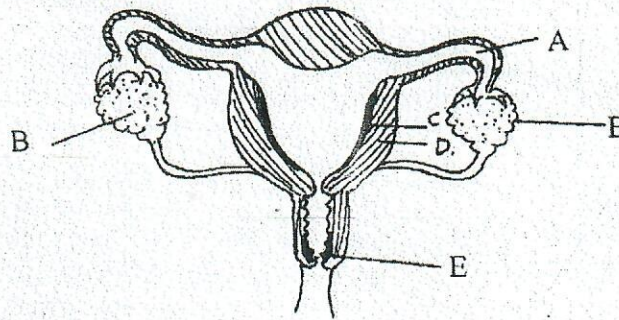
c. Extract and write down a food chain from the above figure.

(1 mark)

- Water plant → Small fish → Large fish → Bird.



18. Study the diagram that follow and use it to answer the questions that follow:



a. Name the part labeled E Vulva (1 mark)

b. What are the functions of the part labeled A? (2 marks)

- Conduction of the ova released by the ovary to the uterus;  
- Where fertilisation occurs;

Qn 19

19. Explain how the following factors hinder self-pollination in plants. (2 marks)

i. Protogyny

- Is a condition in some flowers where the stamens ripen faster / earlier and outlast shed pollen grains before the stigma is mature enough to receive them.

ii. Dioecism

- Is a condition in some flowers where the

20. a) Name the part of the flower that develops into each of the following (2 marks)

i. Seed coat.

Integuments

ii. Seed

Ovule

b) State two environmental conditions that can cause seed dormancy (2 marks)

- Absence of water;  
- Unsuitable temperature;  
- Lack of oxygen.

c) State two ways of breaking seed dormancy (2 marks)

- Scarification - to scratch to make impermeable seed coat permeable;  
- Increase in concentration of hormones e.g. gibberellins & gibberellic to stimulate germination.  
- Favourable environmental factors e.g. water, O<sub>2</sub>, suitable temperature.

d) Give one role of water in germination (1 mark)

- Activates enzymes and provides the medium for enzymes to act and break down the stored food into soluble forms;  
- Hydrolyses & dissolves the food materials and is also the medium of transport of dissolved food substances;

Qn 19.

i. protogyny: - Is a condition where the stigma matures earlier and is ready to receive pollen grains before anthers are



21. Define the following terms as used in genetics.

(3marks)

i. Alleles

• An alternative forms of the same gene that controls the development of a pair of contrasting traits;

ii. Gene mutation

• Refers to the change in the structure of a gene;

iii. Discontinuous variation

• Is a type of variation where there are definite distinct groups of individuals with no intermediate forms;

22. State two sex-linked traits located on the Y-chromosome

(2marks)

- Tuft of hair on the ear pinna & in the nose;  
- premature baldness;

23. State three limitations of using fossil records as an evidence for organic evolution (3marks)

i. - There are several missing fossil records/missing links  
ii. - Distortion of parts during sedimentation which may give wrong impression of the structures.  
iii. - Perturbation of fossils by geological activities e.g earthquakes, faults, uplifts & mass movements.

24. State three types of neurons

(3marks)

- Sensory neurones  
- Motor neurones  
- Relay neurones. Acc. nerves.

25. Name the stimuli which causes the following types of responses

(3marks)

i. Phototropism

- A growth curvature in response to the direction and intensity of light.

ii. Chemotaxis

- A response to variation in chemical substances.

iii. Thigmotropism

- A growth curvature in response to contact with a solid object.

26. Differentiate between support and movement

(2marks)

• Support - Is the ability of organisms to bear their weight and maintain their body forms; whole;  
• Movement - Is the displacement of parts of the body of an organism e.g growth movements in plants & limbs of animals.

THE END