

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/unfavourable 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)

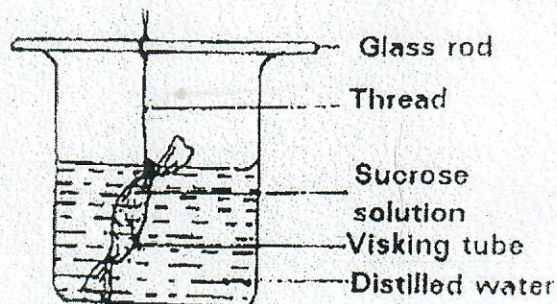
i. Skeletal muscle cell

- 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. - Nerve endings - Detect heat, cold and pain.

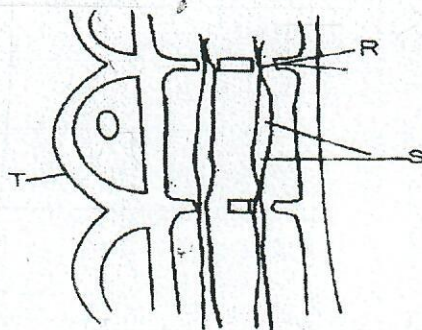
ii. - Blood Capillaries - provides nutrients & oxygen to the living tissues of the dentine and removes waste products.

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 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)

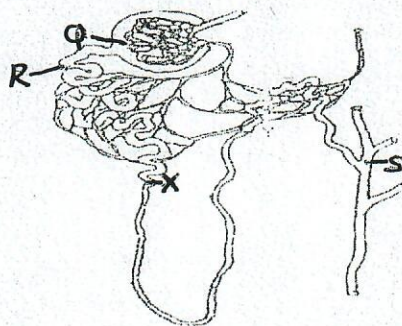
- Stomata;
- Lenticels;
- Pneumatophores;

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 liver;
- 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.

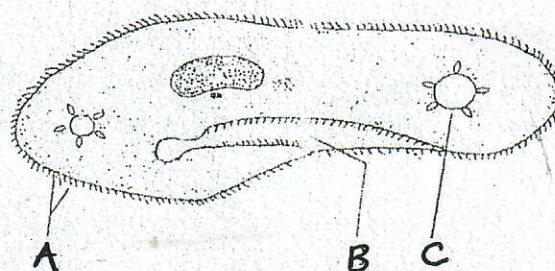
(1mark)

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.

(1mark)

Chordata;

16. Define the following terms;

(3marks)

i. Ecological niche

The position that an organism occupies in a habitat;

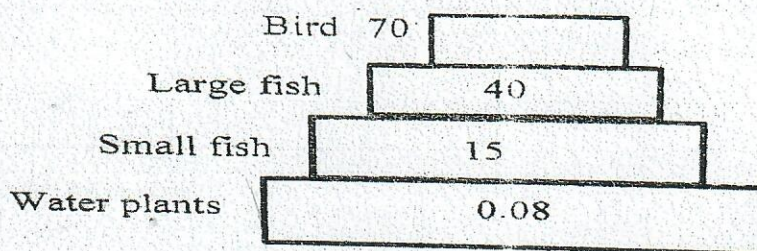
ii. Habitat

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?

(1mark)

Tertiary Consumers;

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

(2marks)

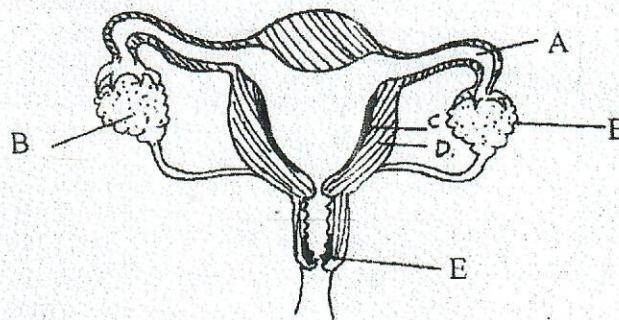
- Through feeding on both type of fish.
- Through taking water.

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

(1mark)

- 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 :- (1mark)

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

- 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. (2marks)

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 (2marks)

i. Seed coat.

Integuments;

ii. Seed

Ovule;

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

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

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

- Scarification - to scratch to make impermeable seed coat permeable;
- Increase in concentration of hormones e.g. gibberellins & gibberellins to stimulate germination.

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

- 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.

7

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 chemical 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 male; -
- 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, uplifting & mass movement.

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; while;
• Movement - Is the displacement of parts of the body of an organism e.g growth movement in plants & limbs of animals;

THE END