

231

BIOLOGY PP 1

FORM THREE

END OF TERM 2

MARKING SCHEME:

1. The diagram below is that of a gill of a fish.

a) Name the parts labeled A and B. (2mks)

A – Gill filament *rej. Gill filaments*

B – Gill bar *rej. Gill bars*

b) State the function of part labeled C. (1mk)

Traps solid particles in water which would otherwise pass over the surfaces of gill filaments and damage them mechanically / physically.

c) Explain how structure labeled A is adapted to its function. (2mks)

(a) Moistened to facilitate diffusion of gases in solution form.

(b) Large and extensive to provide a large surface area for gaseous exchange.

2. (a) Give the products of aerobic respiration in plants and animals. (3mks)

Carbon (IV) oxide.

Water.

Energy (ATP)

(b) Name two factors that affect the rate of respiration. (2mks)

- **Substrate concentration.**

- **Oxygen concentration.**

- **Hormones.**

- **Surface area to volume ratio.**

3. Explain why red blood cells burst when placed in distilled water while plant cells remain intact. (3mks)

Plant cells are enclosed by a rigid, cellulose cell wall, while the red blood cells are enclosed by a fragile (delicate) cell membrane which makes the red blood cells to burst when placed in distilled water.

4. Distinguish between diffusion and osmosis. (2mks)

Diffusion is the process by which molecules move from a region of high concentration to a region of low concentration while osmosis is the process that involves the movement of water molecules from a region of high water concentration to a region of low water concentration across a semi-permeable membrane.

5. A form three student came across two different types of fruits which are described as follows:

Fruit A

Has free central placentation, hard epicarp and fibres air-filled mesocarp.

Fruit B

Has axile placentation, fleshy mesocarp and brightly coloured epicarp.

a) Suggest the possible agent of dispersal of each type of fruit. (2mks)

Fruit A – Water

Fruit B – Animal.

6. A student examining pond water came across a certain living organisms which he drew as shown below.

i) Identify the organism shown above. (1mk)
Paramecium.

ii) State the kingdom of the above organism. (1mk)
Protocista

iii) Name the structure labeled A. (1mk)
Oral groove.

iv) State the function of the part labeled B. (1mk)
Removes excess water from the animal body.

7. Give the role of the following hormones during menstrual cycle. (3mks)

a) Follicle stimulating hormone.

It causes Graafian follicles to develop in the ovary

It stimulates the tissues of the ovary to secrete another hormone called oestrogen.

b) Oestrogen.

Brings about repair and healing of the endometrium which is destroyed during menstruation.

c) Luteinizing hormone.

Stimulates the maturity of Graafian follicle.

8. During a surgical operation, a doctor accidentally cut two blood vessels A and B. Out of blood vessel A, blood was spurting out while through blood vessel B, blood was flowing smoothly.

i) Identify blood vessels A and B. (2mks)

Blood vessel A – Artery.
Blood vessel B – Vein.

9. What are the disadvantages of a sexual reproduction? (3mks)
- **Takes a longer time to reproduce.**
 - **Few offsprings are produced at a time.**
 - **Involves two different sexes for mating to occur.**
 - **Undesirable characteristics from the parents may be passed on to the offspring.**
10. During cold weather, very small mammals eat more than their own weight of food per day whereas large mammals eat food which is only a small fraction of their weight. Give an explanation for this. (3mks)
- Small mammals have a relatively large surface area to volume ratio as compared to large mammals. Because of this, small mammals lose heat to the external environment very fast. In order to maintain their body temperature relatively constant, they have to increase their metabolic rates considerably. This requires that they eat a lot of food.**
11. State the function of the following cell organelles. (3mks)
- a) Lysosomes.
They contain lytic enzymes that destroy aged and unwanted cell organelles, materials taken in by the cell from its environment.
- b) Ribosomes.
They form sites for protein synthesis.
- c) Golgi apparatus.
Packaging and transportation of glycoprotein as secretions.
Transport of synthesized materials out of the cell as secretions.
12. Pregnancy would persist after the expiry of the fifth month of pregnancy even if the two ovaries are surgically removed from the body of female individual. Give an account for this. (2mks)
- After the expiry of the third month of pregnancy, the placenta takes over the role of ovaries of secreting hormone progesterone, which maintains pregnancy.**
13. List two main branches of biology and for each, give a definition. (2mks)
- Botany – is the study of plants.**
Zoology – is the study of animals.
Microbiology – is the study of microscopic organisms.
Rej. any other branch.
14. What is the role of vascular bundles in plant nutrition? (3mks)
- Vascular bundles contain xylem and phloem.**
Xylem – conducts water and mineral salts from the roots to the leaves.
Phloem tissues – translocate manufactured food, soluble and organic products of photosynthesis from the leaves to the rest of the plant parts.

- The student should state the name and the function.

15. What do you understand by the term double fertilization in plants? (2mks)

This is whereby, one of the male nuclei fuses with the egg cell nucleus, to form a diploid zygote which develops into an embryo, while the other male nucleus fuses with the polar nucleus to form a triploid nucleus that develops into primary endosperm nucleus.

16. Define the following terms as used in ecology. (3mks)

i) Carrying capacity.

Maximum number of organisms an area can comfortably support without depletion of the available resources.

ii) Biosphere.

Is the part of earth and atmosphere inhabited by living organisms.

iii) Ecological niche.

Is the position that an organism occupies in a habitat.

17. Distinguish between intra-specific and inter-specific competition. (2mks)

Intra-specific competition is a competition between individuals of the same species, while inter-specific competition is between individuals of different species.

18. (i) Name the process through which free atmospheric nitrogen is converted into nitrates. (1mk)

Nitrogen fixation

(ii) Name the bacteria found in root nodules of leguminous plants. (1mk)

Rhizobium.

(iii) What is the role of bacteria named (a) above. (1mk)

Convert nitrogen into nitrates or fix Nitrogen gas into nitrate compounds.

19. In a capture-recapture exercise to estimate population size of dragon flies on a stretch of rivers, 250flies were first caught and marked. Two days later 500 flies were caught in the second capture and out of this, 50 flies had marks on their bodies. Estimate the population size of the flies. (show your working) (3mks)

$$\begin{aligned} \text{Total population} &= \frac{\text{First number marked} \times \text{Second capture}}{\text{Marked recapture}} \\ &= \frac{250 \times 500}{50} \end{aligned}$$

= 2500 dragon flies < rej. 2500 alone >

Rej. if the formula is wrong.

20. The diagram below shows a stage of a certain type of cell division.

- a) Identify the stage and type of the cell division the above cell is undergoing. (2mks)
Stage – metaphase rej. metaphase I
Cell division – mitosis
- b) State two importance of the above type of cell division. (2mks)
 - **Forms the basis for asexual reproduction.**
 - **Formation of new body cells hence growth.**
21. (a) What is placentation? (1mk)
Is the arrangement of the ovules in an ovary.
- (b) Give three types of placentation. (3mks)
 - **marginal placentation.**
 - **Basal placentation.**
 - **Parietal placentation.**
 - **Axile placentation.**
 - **Free central placentation.**

Give any 3.
22. Identify four ways through which the HIV/AIDS virus is transmitted. (4mks)
 - i) Through sexual intercourse.**
 - ii) Through blood transfusion, transplant and by use of contaminated surgical instruments.**
 - iii) Infected mothers can transmit HIV/AIDS to babies during birth and through breast milk.**
 - iv)**
23. State the mode of asexual reproduction in; (3mks)
 - a) Yeast.
Budding.
 - b) Amoeba.
Binary fission.
 - c) Rhizopus species.
Spore formation.
24. (a) Name one defect of circulatory system in humans. (1mk)
Thrombosis

Arteriosclerosis.

- (b) State three functions of blood other than transport. (3mks)
- **Regulation of pH of body fluids.**
 - **Regulation of blood temperature.**
 - **Defense against disease-causing organism.**
 - **Prevent excessive bleeding by enhancing clotting / prevent excessive loss of blood.**
25. What do you understand by the term oxygen debt? (2mks)
The amount of oxygen required to get rid of accumulated lactic acid in the body when the body produces energy by anaerobic respiration.
26. List any two distinguishing features of class arachnida. (2mks)
- **Have two segmented body parts.**
 - **Have eight jointed legs or appendages.**
27. Give the name used to refer to fruit development without fertilization. (1mk)
Parthenocarpy.
28. During which phase of meiosis does crossing over occur? (1mk)
Prophase I