**BIOLOGY**

**FORM TWO**

**END-TERM 2 EXAM 2024**

**TIME: 1 ½ HOURS**

**INSTRUCTIONS:**

Answer all the questions in the spaces provided.

1. (a) Define the term growth. (1 mk)

 **It is the irreversible increase in size and mass of an organism.**

 (b) Name the tissue in plant responsible for:

 (i) Primary growth (1 mk)

 **Apical meristem**

 (ii) Secondary growth (1 mk)

 **Cambium meristem**

2. The potato cylinders were carefully divided on a blotting paper and weighed. Each piece

 weighed 2 grams. One was placed in each test as shown in the diagram below.



 (a) After 48 hours, which potato cylinder will be heavier. Explain. (2 mks)

 **- Potato cylinder in tube A/ distilled water; as water molecules moved into the**

 **potato cylinder by osmosis.**

 (b) Name the substances whose movement was responsible for the weight changes in the

 potato cylinder you identified in (a) above? (1 mk)

 **Water**

 (c) Name the process which was responsible for the movement of the substance you

 identified in (b) above. (1 mk)

 **Osmosis**

3. Why are the following steps taken when preparing across section of a leaf for viewing under

 the microscope?

 (a) Cutting thin section. (2 mks)

 **Allows light to pass through; making it easy to observe the tissue**

 (b) Placing the section in water. (2 mks)

 **To maintain the turgidity; and hence the shape of the cells prevent drying.**

4. Below is a dental formula of a mammal

 O, CO, PM 3, M2

 4 O 3 3

 (a) What is the total number of teeth (1 mk)

 **(5 + 10)2 = 30**

 (b) (i) What is the mode of feeding in the mammal? (1 mk)

 **Herbivorous, herbivore**

 (iii) Give one reason for your answer above. (1 mk)

 **Lack upper incisors/lack canine teeth**

5. The figure below shows a structure used in gaseous cells



 (a) What do guard cells lie in close contact with epidermal cells? (1 mk)

 **To be able to draw water from the neighbouring epidermal cells/regulating opening and closing of stomata**

 (b) Identify the structure,. (1 mk)

 **Tracheal system;( reject without system)**

 (ii) Explain one observable texture on the figure that adapts the structure to its function.

 (2 mks)

 **Have bands of chitin on tracheole to allow diffusion of gases.**

6. The diagram below represents an organ of gaseous exchange.

 

 (a) What is the name of the organ? (1 mk)

 **Gill**

 (b) State two ways in which structure X is adapted to gaseous exchange. (2 mks)

 **X is highly folded to provide a large surface area for gaseous exchange**

7. How does carboxyhaemoglobin lead to death? (2 mks)

 **Carboxyhaemoglobin does not readily dissociate and therefore reduces the capacity of haemoglobin to transport O2 to tissue. This makes it poisonous when breathed over a considerable length of time.**

8. Name the cell structures that synthesize the following cell organelles:-

 **(a) Lysosomes - Golgi body (1 mk)**

 **(b) Ribosomes - The nucleolus (1 mk)**

9. What is the importance of the stoma in the Chloroplast? (2 mks)

 **It provides a volume around the different structures inside of the chloroplast for**

 **protection.**

 **Light – Independent reaction process of photosynthesis takes place in stoma.**

10. State three adaptations that enables prey to evade predators. (3 mks)

 **- Camouflage**

 **- Highly developed senses**

 **- Staying out of sight**

11. Study the diagram below and answer the questions that follow.



 (a) Name the blood vessels labeled A to E. (2 mks)

 A \_\_\_\_Aorta

 E \_\_\_\_Vena cava

 (b) State two differences between blood vessel B and D. (2 mks

  **B D**

 **Carries blood that is oxygenated Carries Deoxygenated blood**

 **Carries blood under high pressure Carries blood under low pressure**

 **as it lacks valves as it has valves**

 (c) State two adaptations of the blood vessel labeled C to its functions. (2 mks)

 **- Have valves to prevent backflow of blood.**

 **- Have thinner walls and larger lumen to prevent backflow of blood**

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12. (a) Name three factors affecting the rate of breathing in human beings. (3 mks)

 **- Exercise**

 **- Age**

 **- Emotions**

 **- Temperature**

 (b) Define the following terms as used in gaseous exchange. (2 mks)

 **(i) Tidal volume – Small volume of air taken in and out of the lungs during normal**

 **breathing.**

 **(ii) Residual volume – Air that normally remains in the lungs.**

13. Draw a well labeled diagram of the guard cells. (3 mks)



14. State three properties of lipids. (3 mks)

 **- Both fats and oils are insoluble in water**

 **- Lipids readily dissolve in organic solvents; such as alcohol forming suspensions**

 **and emulsions**

 **- Lipids are quite inert.**

15. The diagram below represents a cross section obtained from a plant. Use it to answer the

 questions that follow.

 

 (a) From which part of the plant was the section obtained from? (1 mk)

 **Dicotyledonous root**

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

 **Have a star-shaped xylem**

 (c) Name part B. (1 mk)

 **Xylem**

 (d) Name the material that strengthens the part you named in (c) above. (1 mk)

 **Lignin**

16. Name the conditions under which urine production increases in animals. (2 mks)

 **- Decrease in environmental temperature**

 **- Increase liquid intake e.g. alcohol**

 **- Increase caffeine intake**

 (b) What is diabetes insipidus? (1 mk)

 **It is a condition that is characterized by passing out large quantities of**

 **dilute urine.**

17. Explain the structure of the skin to its functions. (5 mks)

 **- The skin is the largest body organ, it o=covers the whole body surface**

 **- The skin is composed of:**

 **The upper layer called the epidermis and the inner layer called the dermis**

 **The epidermis is made up of three layers namely the; Cornfied layer, granular layer and Malpighian layer.**

 **(1) Cornfied layer – Outermost layer of epidermis**

 **- Made up of dead cells that become filled with a tough, flexible substance called Keratin**

 **- Which provides protection against mechanical damage and invasion of micro-organisms**

 **(2) Granular layer -Middle layer of epidermis consisting of living cells**

 **- They give rise to the cornfied layer when they die.**

 **(3) Malphagian layer –**

 **Innermost of epidermal layer and I made up of actively dividing cells**

 **Have pigment called melanin to giver colour to skin and also give protection against harmful effects of ultra-violent rays from the sun.**

 **(4) The dermis – thicker than the epidermis**

 **(5) Blood vessels**

 **(6) Sweat glands**

 **(7) Hair**

 **(8) Sebaceous glands**

18. (a) What is photosynthesis? (1 mk)

 **It’s the process by which plants make their own food using energy through light.**

 (b) Discuss three factors affecting the rate of photosynthesis. (6 mks)

 **Light intensity**

 **CO2 concentration**

 **Temperature**

19. Explain the economic importance of plant excretory products. (5 mks)

 **Caffeine - Stored in coffee berries and tea leaves**

 **- Taken as a mild stimulant that increases mental activity and reduces fatigue**

 **Quinine - Waste product stored in the back of Cinchoma tree and aloe leaves**

 **- Used for the treatment of Malaria**

 **Cannabis - Stored in fruits, flowers and leaves of cannabis saliva**

 **- Used in manufacture of drugs.**

 **Nicotine - Found in leaves of tobacco plant**

 **- Manufacture of insecticides and narcotic drugs**

 **Rubber - Made from latex of rubber plant**

 **- Used in shoe industry**