**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)

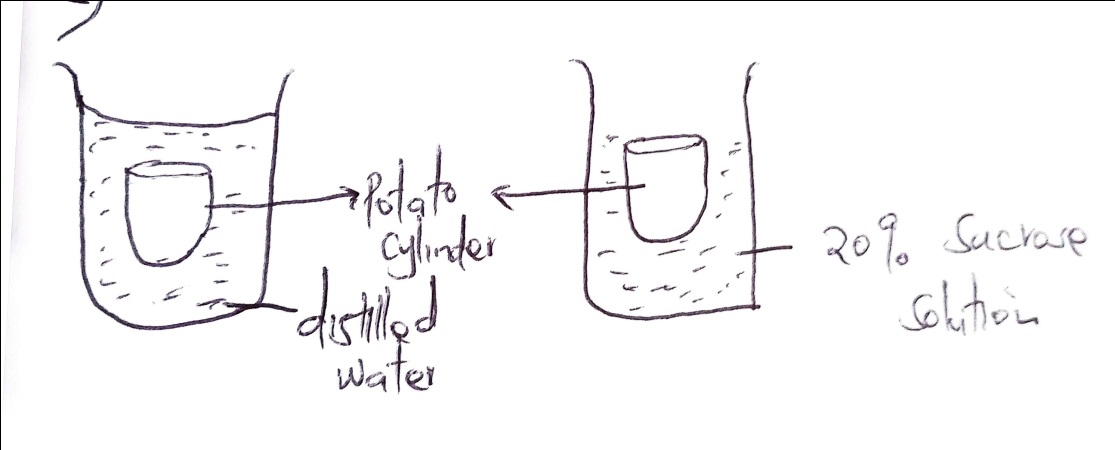
**Apical meristem**

(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**

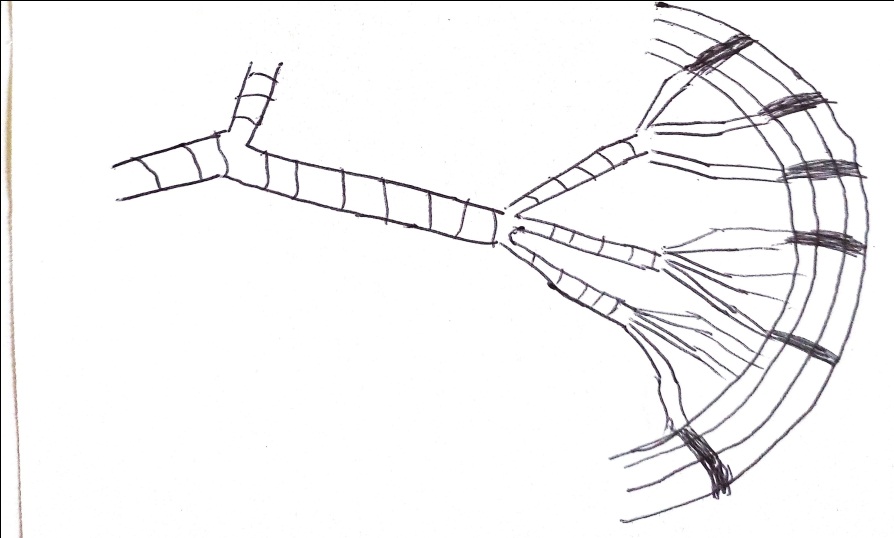
(b) (i) What is the mode of feeding in the mammal? (1 mk)

**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)

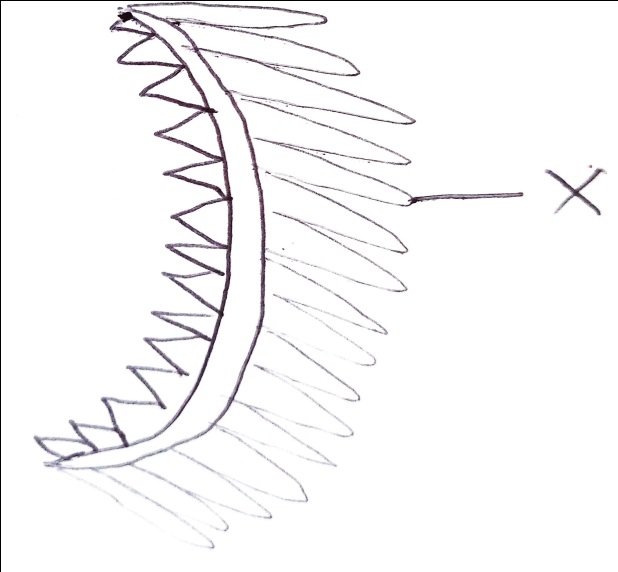
**Tracheal system;( reject without system)**

(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.**

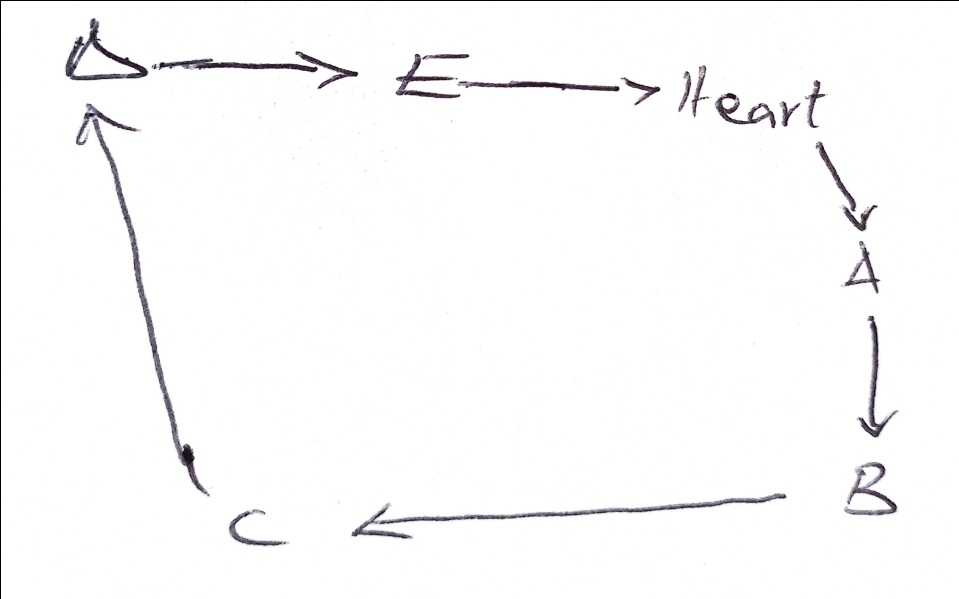
10. State three adaptations that enables prey to evade predators. (3 mks)

**- 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**

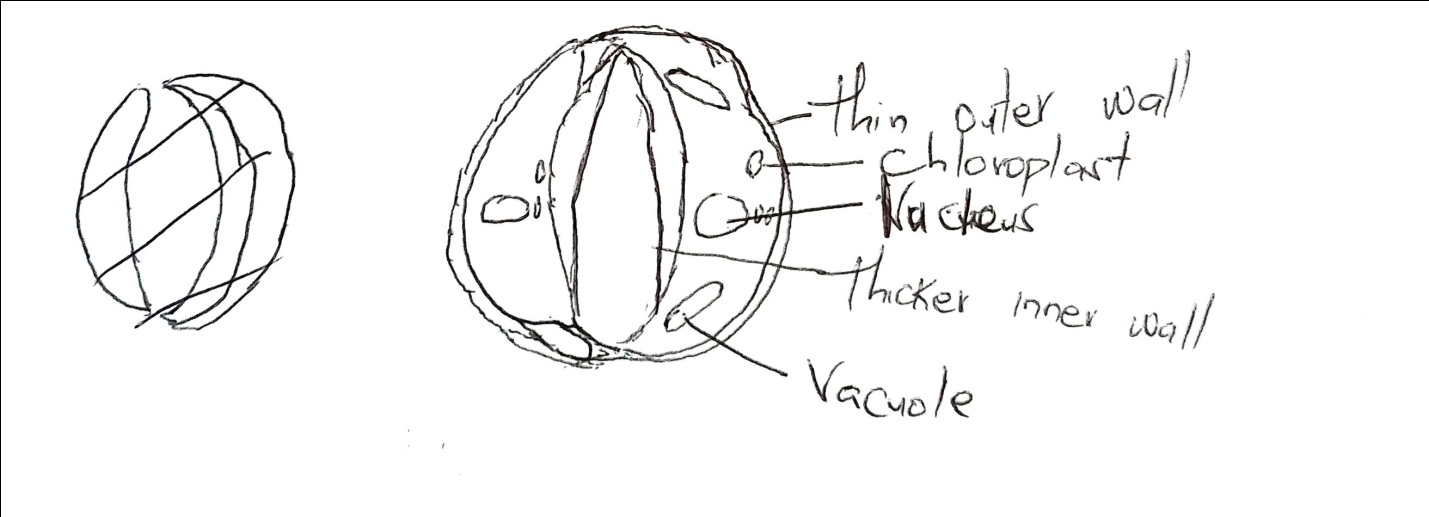
(b) Define the following terms as used in gaseous exchange. (2 mks)

**(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**

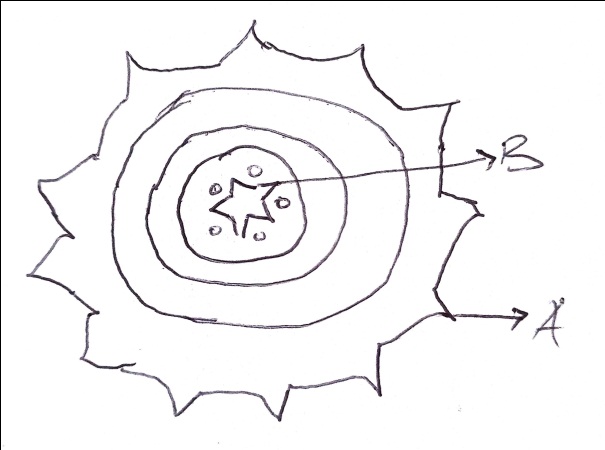
**- Lipids readily dissolve in organic solvents; such as alcohol forming suspensions**

**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**