

FORM 2 BIOLOGY

MID TERM 2 EXAM - JUNE 2025

1. **Explain** the following terms.

a) Taxonomy(1 mark)

The science of classification

b) Species(1 Mark)

Group of organisms whose members naturally interbreed to produce fertile offsprings

2. State **two** main functions of a microscope.(2marks)

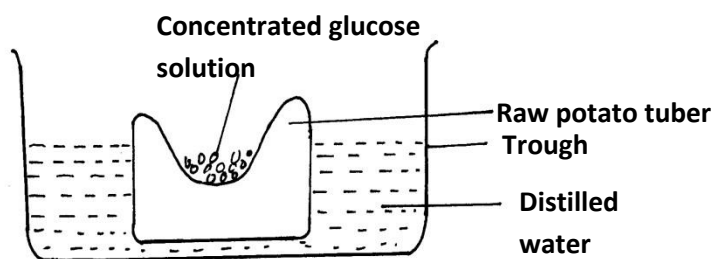
Magnification

Resolution

3. State **two** functions played by the cell wall in plant cells and give the adaptation of the cell wall to performing each of the stated functions. (4 marks)

| Function | Adaptation |
|-------------------------------------|-----------------------------|
| Provides structural support | made up of cellulose |
| Allows exchange of materials | Fully permeable |

4. The experiment illustrated below was set up to investigate a certain physiological process using a raw tuber



(a)Suggest the physiological process that was being investigated. (1 mark)

Osmosis

(b)Explain the results obtained in the above experiment after a few hours(2 marks)

The glucose solution increased while the water level in the trough decreased. Water enters by osmosis into the potato tuber.

(c)State the observations that would have been made if the experiment was repeated using boiled potato. (2 marks)

The water level remains the same in the trough and the glucose solution remains the same; No osmosis occurs sine the cell membranes of the potato cells are destroyed

5. (a) State **two** importance of active transport in living organisms (2 marks)

Reabsorption of sugars and useful substances by the kidney
Absorption of mineral salts by plant roots.

- (b) Why is oxygen concentration important in active transport? (1 mark)

Oxygen is important in formation of energy which is required in active transport

6. What is the significance of each of the following in photosynthesis?

(i) Chlorophyll in the leaf (1 mark)

Traps light for photosynthesis

(ii) Stomata on the leaf surfaces (1 mark)

Allows for entry of carbon (iv) oxide and oxygen gas

(iii) Leaf midrib and veins (1 mark)

Leaf veins contain xylem and phloem (xylem transports water and mineral salts to the photosynthetic cells while phloem translocates manufactured food from the leaves.

7. Name the form in which carbohydrates are stored in. (2 marks)

i). Plants tissues

Starch

ii). Animal tissues

Glycogen

8. An animal has the following dental formula

$$\begin{array}{ccccccc} \text{I} & 3 & & \text{c} & 1 & & \text{pm} & 4 & & \text{m} & 2 \\ 3 & & & 1 & & & 3 & & & & \end{array}$$

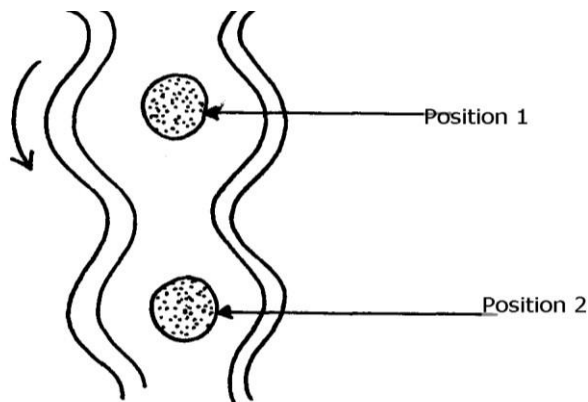
- a) Calculate the number of teeth. (1 mark)

42 (show working)

- b) Explain what would result from blockage of bile duct. (2 marks)

Impaired digestion of fats; emulsification is impaired

9. The diagram below shows how food bolus move along the human esophagus and the Intestine



(a) Identify the process illustrated in the diagram

(1 mark)

Peristalsis

(b) Name **one** component of a person's diet that assists in the movement of food described in from position 1 and position 2

(1 mark)

Roughage

10. The table below show the percentage composition of carbon (IV) oxide and oxygen inhaled and exhaled air

| Gases | Inhaled air | Exhaled air |
|-------------------|-------------|-------------|
| Oxygen | 20% | 17% |
| Carbon (IV) oxide | 0.04% | 4.0% |

Explain the differences in the percentage of the two gases in inhaled and exhaled air. (2 marks)

Exhaled air has less oxygen because some of the inhaled oxygen has been used in the tissues for respiration; exhaled air has more carbon (iv) oxide than inhaled air; respiration produces carbon (iv) oxide as a waste product

11. The table below shows the energy use per day in kilojoules

| Age(years) | Male | Female |
|------------|--------|--------|
| 2 | 5,500 | 5,500 |
| 5 | 7,000 | 7,000 |
| 8 | 8,800 | 8,000 |
| 11 | 10,000 | 9,200 |
| 14 | 12,500 | 10,500 |
| 18 | 14,200 | 9,600 |
| 25 | 12,100 | 8,800 |

a). From the table, explain why after age 8 males require more energy than females. (1 mark)

Males are more muscular; muscle tissues use more energy

b). Other than sex and age, name **two** other factors that determine energy requirements in human beings. (2 marks)

Basal metabolic rate

Occupation

12. a). Distinguish between *single* and *double* circulatory system

(2mark)

**Single
circulation-**
blood flows
once
through
the heart

for a
complete
circulation

**Double
circulation-**
blood flows
twice
through
the heart
for a
complete
circulation

(b) Name **two** defects of the circulatory system in humans. (2 marks)

**Thrombosis;
arteriosclerosis**

(c) State **two** functions of blood other than transport. (2 marks)

**Regulation of body PH
Distribution of heat**

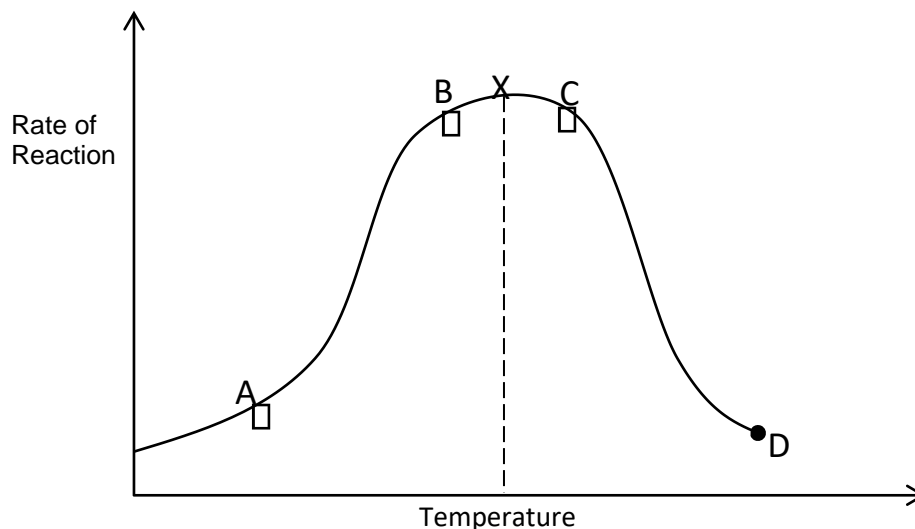
13. State two adaptations of xylem to water transportation

(2 marks)

Narrow to enhance capillarity

Lignified to provide support

14. The graph below show the effect of temperature on an enzyme catalyzed reaction.



- (a) Account for the shape of the curve between.
(i) **A** and **B**.

(3 marks)



The rate of the reaction increases steadily as the temperature approach the optimum point. Enzymes work best within a narrow range of temperatures

- (ii) **C** and **D**.

(2 marks)

The rate of reaction drops; high temperatures denature enzymes

- (b) What does the point marked **X** represent?

(1 mark)

Optimum temperature; maximum rate of reaction

- (c) Apart from temperature, state **two** other factors that affect the rate of enzyme controlled reaction (2 marks)

Substrate and enzyme concentration

pH

14. (a) Distinguish between the terms homodont and heterodont.

(1mk)

Homodonts have teeth of same size and shape

Heterodonts have teeth of different size and shapes

- (b) What is the function of carnassial teeth?

(1mk)

Tearing flesh from bones

- (c) A certain animal has no incisors, no canines, 6 premolars and 6 molars in its upper jaw. In the lower jaw, there are 6 incisors, 2 canines, 6 premolars and 6 molars. Write its dental formula. (1mk)

(i) $\begin{matrix} 0 & 0 & 3 & 3 \\ 3 & 1 & 3 & 3 \end{matrix}$