

OPENER EXAMINATION: TERM 2 2024
MARKING SCHEME
BIOLOGY
FORM THREE

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Question 1

- a) i) Photosynthesis
ii) Oxygen
- b) - Presence of light ;
- Presence of chlorophyll;
- Presence of suitable temperature ;
- c) - Palisade cells;
- Guard cells;
- Spongy mesophyl ;
- Palisade mesophyl;

Question 2

In plants- Guard cells; root hair cells; palisade cells

In animals- sperm cell; white blood cells; Red blood cells; nerve cells.

Question 3

- (i) pair of forceps’;
- (ii) picking up small stinging crawling animals;

Question 4

$$\text{Mag.} = \frac{\text{image size}}{\text{Actual size}} ; \quad 1\text{mm} = 100\mu\text{m}$$
$$40000 = \frac{1 \times 1000\mu\text{m}}{\text{Actual size}}$$
$$\text{Actual size} = \frac{1000}{40,000} \mu\text{m} ; = \frac{1}{40} = 0.015\mu\text{m}$$

Question 5

- i) Hypertonic solution; *acc.* Highly concentrated solution (1mk)
- (ii) Hypotonic solution; *acc.* More dilute solution;

Question 6

- (i) Cellulose; (ii) Glycogen

Question 7

- a) A – Condensation; B – Hydrolysis;
 b) Sucrose;
 c) . Glycosidic; (1mk)

Question 8

- a) Villus
 b) Increases the surface area for absorption of digested food substances/materials
 c) A-microvilli
 B – Lacteal
 D-Arteriole

Question 9

- i. Succus entericus/intestinal juice
 ii. Polypeptidase, sucrose, lactase, lipase,

Question 10

<i>Arteries</i>	<i>Veins</i>
<ul style="list-style-type: none"> • <i>Narrow lumen</i> • <i>Thicker muscle layer</i> • <i>No valves along length</i> • <i>More elastic</i> 	<ul style="list-style-type: none"> • <i>Wide lumen</i> • <i>Thinner muscle layer</i> • <i>Have valves along length</i> • <i>Less elastic.</i>

Question 11

<i>Aerobic</i>	<i>Anaerobic</i>
<ul style="list-style-type: none"> • <i>Oxygen is used.</i> • <i>Breakdown is complete to CO₂ and water.</i> • <i>More energy released.</i> • <i>Water molecules produced.</i> • <i>Occurs in the cytoplasm and mitochondria.</i> • <i>End products the same in plants and animals. (water, CO₂)</i> 	<ul style="list-style-type: none"> • <i>Oxygen not used</i> • <i>Breakdown incomplete to ethanol or lactic acid.</i> • <i>Less energy released</i> • <i>Water molecules are not produced.</i> • <i>Occurs in the cytoplasm.</i> • <i>End products not the same in plants – ethanol in animals – lactic acid</i>

Question 12

- i. Artificial immunity
 ii. A, O
 iii. Activates the conversion of fibrinogen to fibrin

Question 13

- a) Respiration is the process by which food substances are chemically broken down in all living cells to release energy, carbon (IV) Oxide and water.
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 b) Anaerobic respiration

- c) Plants
- d) Lipids

Question 14

- a) Increases the permeability of tubule and blood capillaries to water; regulates the reabsorption of water
- b) Stimulates liver cells to convert glycogen into glucose

Question 15

- Gill rakers act as a screen preventing entry of food and other particles that might damage the delicate gill lamella;
- Gill bar for attachment of gill rakers and gill filament
- Gill filaments – the surface on which gaseous exchange take place

Question 16

- a) $RQ = \frac{\text{Vol of CO}_2 \text{ produced}}{\text{Vol. of O}_2 \text{ used}} = \frac{102}{145} = 0.70;$
- b) Lipids;

Question 17

- a) Amount of oxygen required to get rid of lactic acid that accumulates in the body tissues when oxygen available is lower than the demand
- b) Energy/A.T.P/ Lactic acid

Question 18

- .a) i) Cytoplasm
- ii) Pyruvic acid
- b) Pyruvic acid is broken down; into ethanol and CO₂

Question 19

- b) -baking of bread
- brewing industry

Question 20

A rat has a large surface area to volume ratio thus loses a lot of energy on form of heat therefore eats a lot to replace the lost energy;

Question 21

- .- cells must be provided with glucose or food
- oxygen must be taken in to react with glucose
- favorable temperature should be maintained for efficient enzyme functioning

-end products must be continuously be eliminated from the mitochondrion

Question 22

asthma;bronchitis;whooping cough; tuberculosis

Question 23

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.

Large and extensive to provide a large surface area for gaseous exchange

Question 24

- 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.

Question 25

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.

