BIOLOGY

FORM 2

END YEAR 2025

MARKING SCHEME

1. Define the following branches of Biology. (2 marks)
   i) Genetics
   Study of inheritance and variation
   ii) Entomology
   Study of insects

2. (a) A group of organism that can freely interbreed; to produce viable/fertile offsprings;
   (b) Kingdom;

1. 1. (a) (i) Sweep net; (b) Pouter;

2.

a) Production of ribosomes.

b) Packaging and transport of glycoprotein's
Secretion of synthesized proteins and carbohydrates.
Production of lysosomes.

-Root hair cell -Palisade cell - Parenchyma cell
-Epidermal cell -Guard cell - Companion cell ***Any 3 points***

6 (a) Fatty acids and glycerols are re- assembled into fats and coated with proteins (to stop them sticking together) to form tiny chylomicrons inside intestinal cells: From there the chylomicrons are transported by pinocytosis into lacteals of the villi which eventually empty into circulation;

(b) (i) Lipase;

Accept any named lipase.

(ii) To provide a suitable optimum temperature for the activity of lipase;

(c) Fatty acids ; and Glycerols;

(d) Under the optimum conditions the lipase breaks down the fat emulsion into fatty acids and glycerols; Fatty acids and glycerols diffuses from the visking tubing through the semi – permeable visking tubing membrane; into the indicator – water mixture; the fatty acids results into acid conditions / low PH that turns indicator red;

1. (i) Hydrogen; Oxygen, Energy (2mks)
   (ii) Broad lamina to provide a large surface area for trapping light / gaseous

exchange;

- Has chloroplast to absorb light energy;
- Has stomata for gaseous exchange;
- Thin / transparent cuticle to allow entry of light.
- Vascular bundles for transport of water and manufactured food;
- Leaf mosaic pattern to prevent overshadow. (any 2x1 = 2mks)

2. 28. – Emulsifies fats;
- Neutralises stomach acids;

27. (a) Molar; accept pre-molar.

(b) Presence of two roots; presence of cusps; accept any one.

(c) chewing/crushing food;

(d) Detect stimuli;

1. a. Sodium glycocholate
Sodium taurocholate

Question 3

Transpiration

i) Water lost in vapour form
ii) Mostly through stomata
iii) Pure water lost.

Guttation.

i) Water lost in liquid form (droplets)
ii) Through hydathode
iii) Water contains dissolved substance. *Any two 2mks*

1. (i) Blood type AB:
- It is a universal recipient / can receive blood from all blood groups without agglutination;

ii. Blood type O:
- Can donate blood to all blood groups without agglutination / universal donor;

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- 3. - Transpiration pull √ (1st 3 correct answers)
- - Capillarity √
- - Adhesion /cohesion√
- -Root pressure √
- - Diffusion√
- - Osmosis √
- 14. - Biconcave shaped to provide a large surface area for absorption of oxygen/carbon (IV) oxide √
- - Absence of nucleus hence more haemoglibin to carry sufficient oxygen/carbon (IV) oxide√

- - Alter shape to enable to pass through the narrow lumen of capillaries to supply oxygen/ remove carbon (IV) oxide √
- - Have haemoglobin with high affinity for oxygen/carbon (IV) oxide/uptake of more oxygen/carbon (IV) oxide. √
- - RBC are many/numerous to carry more oxygen/carbon (IV) oxide√
- Rejct – answer if carbon iv oxide/carbon (iv) oxide
- 17. (a) - Numerous to increase the surface area for absorption of water
- - Have numerous mitochondria to supply energy (for active uptake of minerals);
- - Have thin walls for faster movement of substances;
- - Have large sap vacuole with solutes for steep concentration gradient;
- (b) - High humidity reduces concentration gradient of water vapour between the intercellular air
- spaces of the leaves and atmosphere hence reducing rate of transportation;
- 18. (a) - Lignified walls to prevent collapsing;
- - Narrow lumen for capillarity;
- - Perforated end walls to maintain continuous column of water from the roots.
- - Perforated pits – for lateral movement of water;
- (1^{st} two)
- 29. - Antigens A; Antigens B;
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- (b) State **three** mechanisms by which manufactured food is translocated in plants. (3mks)
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- (b) Mechanisms of translocation of manufactures food.
- - Active transport;
- - Mass flow;
- - Surface spreading;
- - Cytoplasmic streaming;

Question 13

(i) Lung book

(ii) Siphon

Gill filaments

29. a)

(i) Glass tubes – trachea;

(ii) Bell jar – Ribcage;

(iii) Rubber sheet – diaphragm;

(iv) Balloons – lungs;

25. - Nasal cavity has hairs and mucus that trap solid particles and dust;

- Nasal cavity is well supplied with blood that warms and moistens incoming air.

- Has olfactory cells that are sensitive to smell; (2 x 1 = 2mks)

Question 5

a) RQ = $\frac{Co_2 produced}{Oxygen\ used}$

$\frac{57}{80}$ =0.71;

b) Lipid / fat.

21.(a) Anaerobic respiration (1mk)

Rej: Respiration alone

(b) (i) To expel all the dissolved oxygen; (1mk)

(ii) Glucose $\xrightarrow{Enzyme}$ carbon (IV) oxide + Ethanol + Energy (1mk)

Acc $C_6H_{12}O_6 \longrightarrow 2CO_2 + 2C_2H_5OH + ATP$;

a) Name the principle labeled X (1mark)

Positive feedback

b) If the above diagram represented blood sugar regulation

i) State the corrective mechanisms carried out at A (2marks)

- Glucose is converted to glycogen

- Glucose is taken to the liver and broken down to produce energy, carbondioxide and water; cell respiration

ii) The condition that may result from the further excess (1mark)

- **Diabetes mellitus**

iii) The hormone that would be responsible for correcting the deficiency (1mark)

- Glucagon

2. (a) The skin as an organ plays a role in Homeostasis. Name **two** roles of the human skin in homeostasis. **(2 marks)**

Thermoregulation; Osmoregulation

(b) Melanocytes are cells of the skin responsible for production of a skin pigment.

(i) Name the pigment produced by melanocytes. **(1 mark)**

Melanin

(ii) In which layer of the epidermis of the skin are melanocytes found? **(1 mark)**

Malpighian

(iii) State the primary function of the pigment named in (b)(i) above. **(1 mark)**

Absorbs harmful ultraviolet radiation

(c) Differentiate Vasodilation from Vasoconstriction. **(2 marks)**

In vasodilation blood vessels come closer to the skin surface in a hot day so as to lose heat; in vasoconstriction the blood moves into he spleen and liver leaving blood vessels deep under the skin

14. (i) More filtration.

(ii) Less reabsorption hence water is passed out in urine.

(iii) Fresh water