

## BIOLOGY FORM THREE MARKING SCHEME

### TERM THREE 2023

1) a) X Fresh water body/ river/ lake/ pond; Reject: Wet/ Aquatic habitat (1 mark)

Y Tropical rain forest; Accept: Forest/ Rain forest; (1 mark)

Z Estuary/ Salt marsh;

Reject: Sea/ Ocean

Reject: Marsh alone: marsh is a wetland that is dominated by herbaceous rather than woody plant species(Cf. Swamp: a wetland dominated by trees)

b) i) Many stomata on the upper epidermis in plant X

Speed up loss of excess water (through transpiration); (1 mark)

ii) Broad leaves in plant Y

Offer large surface area for absorption of sunlight (for photosynthesis)/ gas exchange;

Reject: Offer large surface area for transpiration (1 mark)

iii) Buttress roots in plant Z

Bind the soft mud, prevent the plant from being swept away by (strong) waves/ water currents;

Accept: Anchor the plant firmly into the ground; (1 mark)

a) Give two problems faced by plant X in its habitat

Excessive intake of water by osmosis resulting in low osmotic pressure of its tissues;

Low (sun)light intensity (and thus reduced levels of photosynthesis);

Low concentration of dissolved carbon (IV) oxide (and thus reduced levels of photosynthesis) and oxygen (and thus reduced levels of respiration);

Strong water currents/ waves which may dislodge/ uproot the plant from its substratum;

(Mark the first two. 1 mark x 2 = 2 marks)

2) (a). To show that carbon (IV) oxide is produced during anaerobic respiration;  
(1mark)

(b) There is production of bubbles in the boiling tube of carbon (IV) oxide leading to the formation of a white precipitate in the test tube containing calcium hydroxide solution;  
There is raise in temperature as of result to heat production  
(2marks)

(c) Yeast cells undergo anaerobic respiration producing carbon (IV) oxide gas which dissolves in calcium hydroxide solution forming a white precipitate; production of the gas results in bubbles;  
(2marks)

(d) To kill other micro-organisms present in glucose solution thus eliminating microbial respiration;  
Elimination of air/oxygen  
(1 mark)

(e) Through the use of glucose solution without yeast cells;  
Through use of glucose solution with boiled yeast  
(1 mark)

3).(i) A-Liver;  
B-Gall bladder;  
K-stomach;  
T-Pancreatic duct;

(ii) hydrochloric acid;

(iii) bile

Emulsification of fats;

Neutralize acidic chime;

4) a) P – sporangium;

Q – spore;

R – rhizoids;

b) Formation of spores;

c) i) Causes decomposition of dead matter thus releasing nutrients to the soil to increase it's fertility.

ii) Destroy old cloths/ shoes/ timber;

iii) Causes food spoilage; (mark first two)

- d) i) Fungi;  
 ii) - They lack chlorophyll;  
 - Has cellwall made up of chitin instead of cellulose; (chitinous cellwall)  
 - Store carbohydrates as glycogen; (mark first one)

5) a) i) Prevent entry of respiratory gases. (1mk)

ii) To ensure soil microbes do not interfere with gas volumes in glass bottle. (1mk)

iii) - To consume oxygen released from photosynthesizing plant.

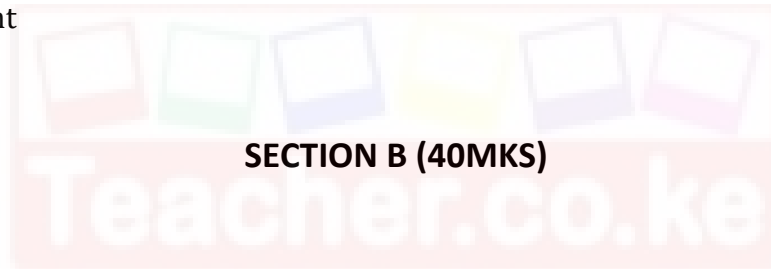
- To release carbon (IV) oxide from it respiration for photosynthesis by plant  
 (2mks)

b) i) Small animal would die. (1mk)

ii) Lack oxygen gas for respiration (1mk)

c) i) Cell membrane

ii) Gill filament



6)

a) i)  $26\text{kgs} \pm 0.5$

ii) Girls 15yrs –girls 13yrs =39-33=6  
 $6 \div 2 = 3.0\text{kg/year}$

iii) Girls at adolescence grow faster: there is an increase in the size of hips and breasts.

b) Girls generally grow faster than boys /boys grow slowly compared to girls: but later after puberty they grow more steadily.

c) Girls above 10 years begin the menstruation cycle they need more iron to replace the blood lost during menstruation.

d)-Height of the body  
 -Volume of the body

7) (a)

**Inhalation**-External intercostal muscles contract ;internal intercostal muscles relax ; ribcage is raised upward and outwards;diaphragm muscles contract ,causing it to flatten;volume of

thoracic cavity increases; while pressure decreases; due to higher atmospheric pressure Air is drawn in through nostrils ;making the lungs to inflate

**Exhalation** –External intercostal muscles relax ;internal intercostal muscles contract ;rib cage is lowered downward and inward ;diaphragm muscles relax and it arches upward/resumes dome shape; Volume of chest cavity decreases/reduces;pressure increases above that of atmosphere; and air is forced out of the lungs;

(b) -Exercise /Activities

- During vigorous physical activities the rate of breathing increases so as to meet oxygen demand .
- Age -Young people have higher demand of oxygen since they are more active.
- Emotions –body emotions such as fear ,anxiety and fright increases the breathing rate.
- Temperature – when temperature is high ,there is tendency to increase the breathing rate.
- Healthy –in health increases body temperature which tend to increase body metabolic rate hence increased breathing rate.
- Altitude –high altitude has low oxygen concentration leading to increase breathing rate.

8) a) Pollen grains land and sticks/adheres onto the stigma;

- It absorbs nutrients/sugary substances and germinates to develop a pollen tube
  - Pollen tube penetrates the stigma and grows down through the style
  - It obtains nutrient from the style (tissues)
  - (As the pollen tube grows down the style), the pollen tube nucleus is located behind the tip as it directs the growth of the pollen tube while the generative nucleus follows behind it.
  - The generative nucleus divides by mitosis (mitotically) into two male nuclei;
  - When pollen tube reaches the ovary, it enters the ovule through the Micropyle; it enters the embryo sac; its tip bursts open/ruptures;
  - The pollen tube nucleus disintegrates creating a clear passage for the male nuclei; (into the embryo sac)
  - One male nucleus fuses with the (two/both) polar nuclei; to form a triploid endosperm nucleus;
  - o Total 16 max
  - o Max 15
- Rej. Degenerates for disintegrates

NB. If an illustration is used mark: -

1. Landing of pollen grains on stigma
  2. Germination of pollen grains
  3. Formation of pollen tube
  4. Position of correctly labelled generative nucleus behind the tube nucleus in pollen tube.
  5. Growth of pollen tube down the style
  6. Entry of pollen tube into the ovule
- (Max 6 marks)

- b) The stamens/petals/sepals/calyx/style wither and drop off/fall off
- The zygote (divides by mitosis to) form the embryo
  - The endosperm nucleus (divides by mitosis) to form the endosperm. (Accept primary endosperm for endosperm)
  - The integuments develop into a seed coat/testa
  - The ovary develops into a fruit
  - The ovary wall develops into a fruit wall/pericarp

Total 6 marks

Rej. Legmen for Testa/seed coat Max. 5

