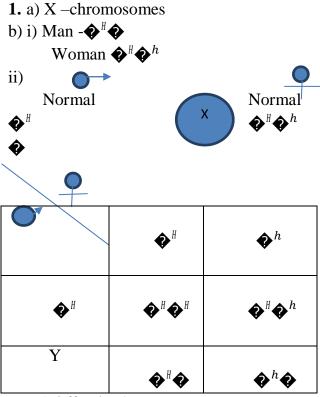
## **KAPSABET BOYS TRIAL 1 2025 MARKING SCHEME**

## **BIOLOGY PAPER 2 MS**



F1 Offspring/progeny

- iii) Males only inherit a single X-Chromosome from their mother's gamete cells
- 2. a) i) Root/dicot root/Dicotyledonous root reject monocot root.
- ii) It contain lignin deposits/it is lignified to provide support.
- b)i) Active transport; reject osmosis
- ii) Presence of root hairs
- iii) Contain lignin deposits /lignified to provide support.
- Contain a large sap vacuole that has high concentration of soluble to raise its osmotic pressure to that become hypertonic thereby facilitating water uptake by osmosis from the soil.
- Thin walled for rapid movement of water and mineral salts into the cell.
- Thin & flexible to penetrate between soil particles to reach the water table.
- Numerous mitochondria to generate enough energy helped for certain uptake of mineral ion from the soil.
- c) Cellulose; pectin
- 3. a) i) Species A
- ii) Rate of multiplication or growth in A is faster than of species B.
- b)i) 1-3 yrs less competition, few or no predators, more suitable environmental conditions such as food, space, resource were not limiting hence population increased exponentially or rapidly.

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- ii) 3-7 yrs –shortage of resources like food or space /limiting birth rate equals death rate; population became constant. Environmental resistance has set in.
- c) Species A would decrease since they are preyed upon, species B would increase because there is less competition with species A and hence more resources available.
- **4.** a) Diffusion (1mk)
- b) i) The suspension in visking tubing turned blue black; while in the beaker /iodine colour retained its colour (2mks)
- ii) The iodine molecules are smaller in size hence could diffuse into visking tubing into suspension: starch molecules are large in size, remains in visking tubing, no effect to iodine solution. (2mks)
- c)Oxygen concentration; change in PH, glucose concentration; temperature (any 3 = 3x1 = 3mks)
- **5.** a) i) Prevent entry of gases 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) Axis -1
- Scale 1
- Plotting -2
- S/Curve 2
- Labelling 1
- b) i) 0-1 hour concentration is constant or low or below normal levels in blood. No digested foods/glucose from the intestines hence no absorption of digested material.
- ii) 1-2 hours Sharp increase- in concentration of glucose in blood; more absorption of glucose after digestion of the food.
- iii) 2-4 hours Glucose concentration decreasing less glucose bring absorbed; more glucose being converted to glycogen in the liver cells. Some used for tissue respiration), because all the food has been digested.
- iv) 5-7 hours concentration of glucose stabilizes digestion has been completed hence no more absorption and excess has been converted to glycogen or respired.
- c) The concentration of glucose in the iliac vein is lower than in the hepatic portal vein; glucose in hepatic portal vein is not regulated by the liver. Glucose that leaves the liver to iliac vein is regulated.
- d) Proteins take longer to digest.
- **7.** a) During the day/in presence of sunlight; guard cells, synthesize glucose /sugar from the photosynthesis process; the synthesized sugar accumulates in the guard cells, increasing

their osmotic pressure (makes them hypertonic to the adjacent cells of the epidermis).By osmosis, guard cells draw in water and bulge outwards opening, the stoma.
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During the night / in absence of sunlight; guard cells are unable to carry out photosynthesis hence sugar is converted into starch; starch lowers the osmotic pressure of the guard cell, hence they lose water by osmosis to the neighbouring epidermal cells become fluidhence closing the stomata.

(Max =10mks)

- b) When blood sugar rises above normal; the hypothalamusstimulates the pancreatic cells to secrete insulin hormone which travels through the blood stream to the liver when it stimulates the liver cells to;
- i. Convert excess glucose/sugar into glycogen
- ii. Increase oxidation of sugar /glucose into energy carbon (IV) oxide and water.
- iii. Convert excess glucose/sugar into fats for storage in adipose tissues.
- iv. Inhibits conversion of glycogen into sugar.

When blood sugar/glucose drops below normal; the hypothalamus stimulates the pancreatic cells to secrete hormones glucagon which travels through the blood stream to the liver; where it stimulates the liver cells, to;

- i. Convert stored glycogen into sugar/glucose
- ii. Decrease the oxidation of sugar/glucose
- iii. Convert stored fats into sugar/glucose

Blood glucose is then restored back to normal levels.

(MAX=10mks)

- **8.** a) Adaptation of xerophyte in living in their habitats.
- Leaves modified to needle like structures reducing surface area for transpiration.
- Leaf surface coated with a relatively thick and waxy cuticle.
- Have few stomata located on lower leaf surface
- Xerophytes have their stomata sunken, trapping air around stomata to reduce rate of transpiration.
- Reversed stomatal rhythm to reduce water loss.
- Xerophytes have flattened shoots and succulent tissue for water storage
- Xerophytes have deep and extensive root system for absorbing water from a light shower.
- Some Xerophytes have a short life cycle.
- Some xerophytes produces latex which reduces rate of transpiration and also are distasteful to herbivores.
- Xerophytes sheds their leaves at the onset of droughts to reduce water loss.
- Some have long tap roots to draw water from deep sub-stratum
- Folds their leaves to reduce transpiration.
- b) Adaptation of hydrophytes to its habitat.
- Have broad leaves to increase surface area for transpiration.
- Have numerous and large sized stomata
- Flowers are held above water to enhance pollination.
- Their root lack root hairs to minimize absorption of water.
- Have large aerenchyma tissues which gives them buoyancy.
- Have reduced root system as they are supported by water.
- Have poorly developed xylem vessel.

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