

KAPSABET HIGH SCHOOL

BIOLOGY

PAPER 2

MARKING SCHEME

1. (a) W - Sebaceous gland;
X - Erector pili muscles; (2mks)

(b) Y - Produces melanin which protects the body against U.V light/ determines the skin colour;

Z - Secretes sweat which evaporates to bring about cooling or
Sweat also removes excretory products/excess salts/water (2mks)

(c) Vasoconstriction; hence less blood flows to the skin surface; reducing heat loss; no sweating; heat produced through metabolisms/shivering; is retained in the body;

6 marks max 4 mks

2. (a) (i) $X^R X^r$ and $X^r Y$; (1mk)

Both must be present

- (ii) Phenotype; Red eyed female White eyed male

Genotype $X^R X^r$ x $X^r y$;

Gametes X^R X^r X^r Y ;

Fusion ;

F1 generation $X^R X^r$ $X^R Y$ $X^r X^r$ $X^r Y$; (4mks)

- (iii) Crossing over;
- Mutations; (1mk)

Any one - 1mk

- (iv) Down's syndrome; klinefelters syndrome; turners syndrome; (2 mks) first 2 - 2mks

3. (a) Aquatic; (1mk)

- (b) (i) Phytoplankton's; (1mk)

- (ii) Hawks; (1mk)

hawks (c) (i) Phytoplankton's → zooplanktons → frogs → snakes →

Reject if arrow is not indicated

(ii) Snakes would decrease (due to less food)

Zooplanktons would increase (due to less predator) 3mks

(d) Oil clogs fish gills;

- Oil cuts off dissolved oxygen in water leading to suffocation

Any one 1 mark

(e) Domestic effluents;

Sewage;

Silting;

Industrial effluents;

Agrochemicals;

Any one 1 mark

4. (a) To find out whether energy/heat is released in anaerobic respiration/fermentation; 1mk

To investigate the gas produced during fermentation/anaerobic respiration; (1mk)

(b) (i) (Significant) rise in temperature; colour of bicarbonate indicator turns yellow; 2mks (ii) Yeast will respire aerobically releasing energy/and carbon (iv) oxide gas that turn indicator

yellow; 1mk

(iii) Expel/drive out oxygen; 1mk

5. (a) Osmosis; (1mk)

(b) - Sugar solution is hypertonic to the cell sap of pawpaw;

- These cells lose water to sugar solution by osmosis;

- These cells thus become more concentrated/hypertonic to the water in the beaker;

- The cells then gain water by osmosis from the beaker;

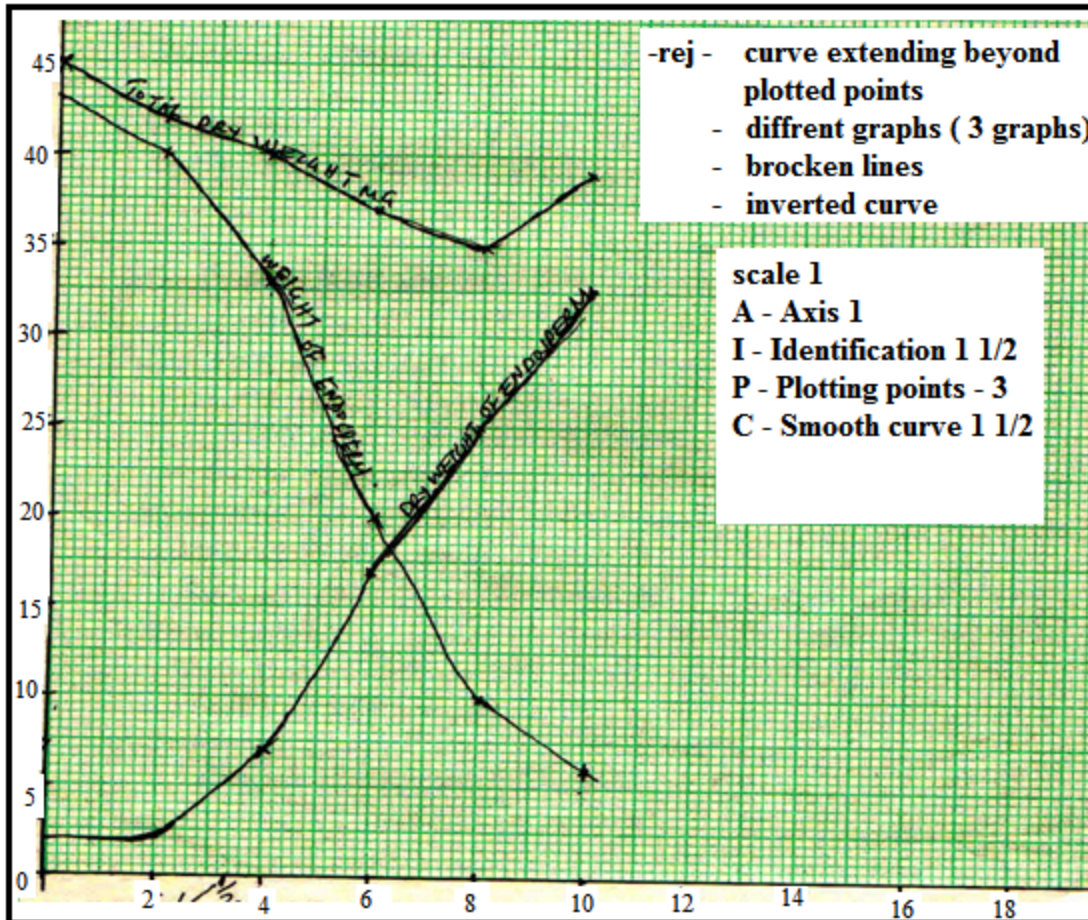
- Causing a rise in level of the sugar solution; (max 4mks)

(c) (i) The sugar solution level will not rise/remains the same/no change;(1mk)

(ii) Boiling kills cells; making them osmotically inactive; (2mks)

(c) Use glucose solution without yeast cells/killed yeast cells; (1mk)

6. a) Graph



b) Total dry weight 38.5mg; acc ± 0.5

c)

- Hydrolysis of starch into simple sugars/glucose which are translocated to the embryo;
Oxidation/respiration of (simple sugars) to the embryo;
CO₂/energy/heat; acc water vapor
- New cells/tissues materials are synthesized (from proteins); bring about growth of embryo
- The rate of respiration is faster than that of synthesis of materials for growth;
- First leaf carried out photosynthesis; (leading to growth)

d)

- ✓ Presence of abscisic acid; (ABA)
 - ✓ Presence of germination inhibitors;
 - ✓ Embryo not fully developed/immature embryo;

- ✓ Absence of hormones/enzymes that stimulate germination;
Acc inactivity of hormones/enzymes inhibitors;
 - ✓ Impermeable seed coat;
Acc for germination hormones such as cytokines, gibberellins;
 - ii. Unsuitable temperatures/lack of suitable/unfavorable temperatures; absence of light; lack of O₂ Rej lack of air
Lack of water
- e)
- Dense cytoplasm; thin cell walls
 - Absence of vacuoles (cell sap);
7. (a) Fertilization is the fusion of the male and female nuclei in the embryo sac; this is preceded by the process of pollination which involves transfer of pollen grains from the anther to the stigma;
Stigma secretes sticky substance; which causes adherence of pollen grains; and stimulates germination of pollen tube; pollen tube grows down the style deriving nutrients from the style tissues; the tube nucleus follows behind; generative nucleus divides mitotically to form two male nuclei; in the ovule the pollen tube penetrates the embryo sac and the tube nucleus disintegrates; one of the male nuclei gets in and fuses with the egg cell nucleus; to form a diploid zygote; the other male nuclei fuses with polar nucleus; to form a triploid primary endosperm nucleus; hence double fertilization in flowering plants;
- (b) Corolla/stamens/style wither/dry and fall off;
Calyx persists;
Ovule develops into a seed;
Zygote forms an embryo;
Primary endosperm tissues develops into an endosperm;
Ovary forms a fruit;
8. (a) External intercostals muscles contract; internal intercostals muscle relax, this movement pulls the Rib cage move outwards; and upwards; Diaphragm muscles contract, which causes the Diaphragm to flatten; volume in thorax cavity increases; pressure reduces.
Atmospheric air enters the lungs; inflate (correct sequence to be followed)
- (b) Guard cells have chloroplast which photosynthesis in the presence of light, to form sugar, the osmotic pressure of guard cell increases; water move from neighbouring cells into guard cells being thicker than outer walls. Causes the outer wall to stretch more resulting guard cells budging outwards.