**231/2 BIOLOGY PAPER 2**

**Biology Paper 2 Marking Scheme.**

**SECTION A [40MKS]**

1. [a] Genes occurring on sex-chromosomes that are inherited together with genes that determine sex; [OWTW] (1mk)

[b] (i) XH Y; XHXh (2mk)

Female Male (4mk)

XH xh  X XH Y 





XH XH  XHY XHXh XhY

F1 genotype

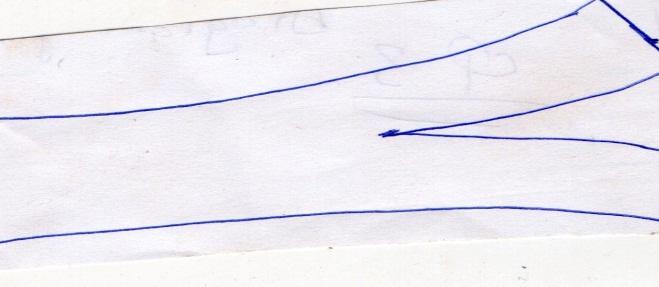
(iii) F, phenotypic ratio

2 normal female; normal male; 1 haemophilic male; (1mk)

1. [a] Osmosis; (1mk)

[b] Solution Y is hypertonic/higher concentration than RBC’s cytoplasm; water moved from cells to solution Y by osmosis; cell became crenated / shrinks; (3mk)

[c] (i) 1MK



(ii) Inner/Cortex cells/ cortical cells absorbs water by osmosis; becoming turgid/expanding; Epidermal cells/outer cells have waterproof cuticle; thus, did not gain water/gained little water and did not expand; (3mk)

1. (a) (i) Cell membrane;

(ii) Tracheole system/Tracheoles; ( 2mks)

(b) (i) A. – (Gill) filament, rej. Filaments 3mks

B. – (Gill) bar;

C. – (Gill) racker; Rej: rakers

(ii) Prevent solid particles from harming/injuring gill filaments; 1mk

(iii) – Thin membrane for fast diffusion of gases;

- Supplied with blood capillaries to transport gases

- numerous to increase surface area for gaseous exchange; (any 2)

4. (2mks)

1. Divergent evolution 1mk
2. Ancestry origin of the limb suggest there were habitants of aquatic environment. 1mk
3. i)Vestigial structures

Highly reduced structure due to disuse 1mk

ii)Appendix ,coccyx ,nictating membrane eye ,muscles that moves the ear. 1mk

1. (i) Natural selection

Situation whereby the nature Favours organisms suited for survival and eliminate those that are less adapted. 2mks

ii) an example of nature selection in action 1mk

* Resistance to antibiotics and pesticides
* Industrial mechanism

1. More precipitation is observed when serum of closely related organism are mixed and vice versa. 1mk
2. Name the parts labeled **J, A**, **B** and **F**. (4 marks)

J – kidney; rej. kidneys

A – ureter;

B – urinary bladder;

F – urethra;

b) State the function of parts labeled **H** and **E**. (2 marks)

H – production of sperms;

E – storage of sperms;

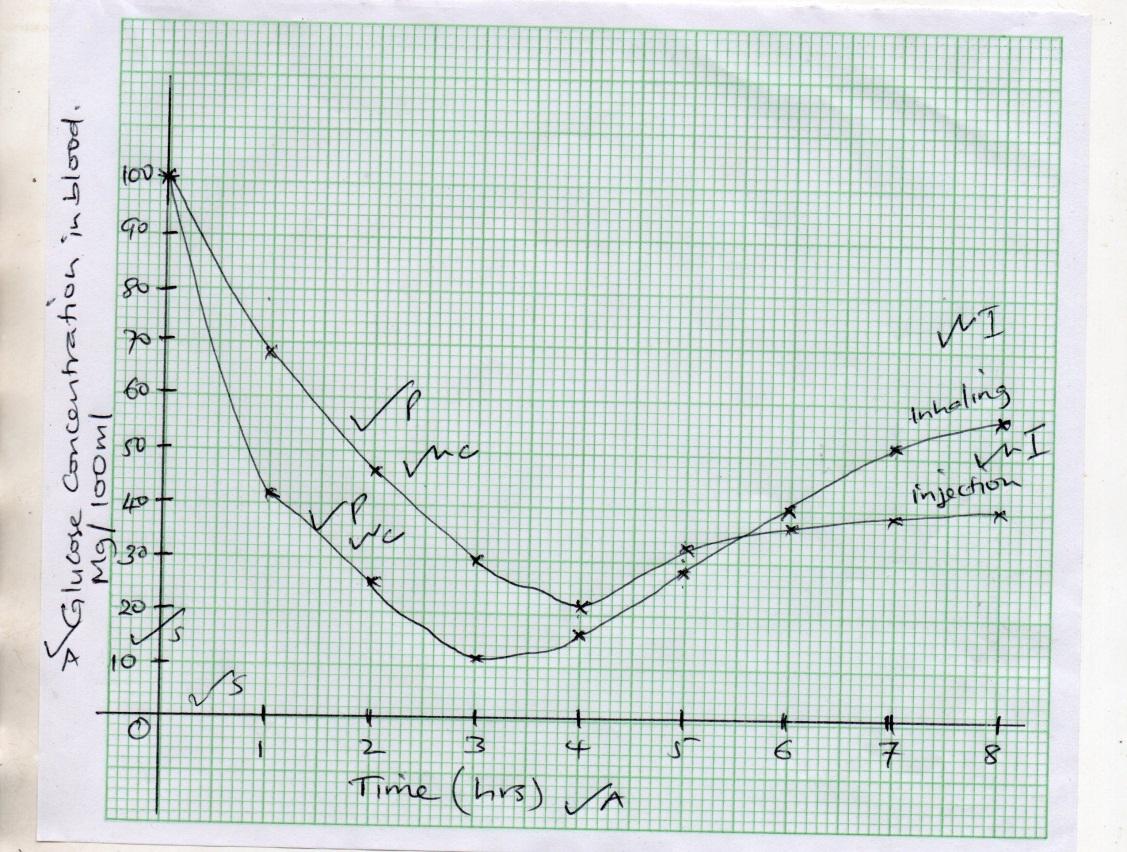
c) Name the secretion produced by structure **D** and *I* . (2 marks)

D -prostate gland;

I -Cowper’s gland;

**Section B: (40 Marks)**

**6.**



1. Axes 1 x 2 = 2 (must indicate units) Scale 1 x 2 = 2

Plotting 1 x 2 = 2 Curves ½ x 2 = 1 Identity ½ x 2 = 1

1. 6 hrs 12 min; + 5 min 1mk
2. On inhaling insulin, blood glucose concentration reduces; more rapidly than on injecting insulin; because when insulin is inhaled, its concentration in blood rises faster/reaches the liver faster; on injection, insulin takes longer to reach the liver.

3mks

1. Insulin stimulates liver (cells); to convert excess glucose to glycogen; or to fat; it also increases rate of oxidation of glucose to water and carbon (IV) oxide / respiration.3mks
2. (i) Pancreas; 1mk

(ii) Presence of sugar/glucose in urine/glycosuria;

* Frequent urination/chronic feeling of thirst.
* Chronic feeling of hunger/starvation;
* Weight loss;
* Fatigue; 2mks (first 2)

1. Advantage

* Faster response time/less chance of injury or infection/good for people who fear injections. 1mk

Disadvantage

* It can cause very rapid massive reduction of blood glucose making the patient to faint/collapse.
* Its effect is short lived/not long lasting and needs to be taken more often. 1mk

1. [a] Broad/ flat lamina /large; to provide large surface area for carbon (IV) oxide; and light absorption;

* Thin leaf to allow carbon (iv)oxide to pass through a short distance for rapid diffusion of gases;
* (Presence of) numerous/ many stomata; on the other upper epidermis, ensuring efficient diffusion of carbon (IV) oxide;
* Cuticle/ epidermis transparent to allow penetration of light to palisade/ photosynthetic cell;
* ( Presence of) numerous aerenchyma tissues for ; which enables the plant to float;
* Leaves of the completely submerged plants are highly branched /divided deeply dissected/truncated ; to increase the surface area for photosynthesis;
* Leaves of submerged plants have increased number of chloroplasts for efficient absorption of light;

(14 max 11 mks)

[b] - coiled: which allows more time for digestion and absorption;

* The inner lining has villi and microvilli which increases the surface area for absorption;
* Long/highly folded; offering a large surface area for the absorption and digestion of food;
* Has intestinal glands; that secretes intestinal juice that contains digestive enzymes/ maltase, sucrase;
* Contains villi with numerous blood vessels; to transport absorbed nutrients;
* Villi contains lacteal lymph vessels; for transport of fatty acid and glycerol;
* Villi have a thin epithileum/ lining; for faster diffusion of digested food.
* Have goblet cells; that secrete mucus for lubrication of food and protection of the wall from digestive enzymes. (17 max 10 mks)

**8. 1. Water dispersal ;**

- Mesocarp/seeds have air spaces to make it buoyant; in order to float and be carried by water;

- Seeds/fruits protected from soaking with water by water proof testa/pericarp.

- Seeds of plants like water lily have seed coat that trap air bubbles which make the seed float on water and be carried away from the parent plant;

**2. Animal dispersal;**

- Some have hooks for attachment to animals; which carry them to other places;

- Some have brightly coloured pericarp to attract insects;

- Fruits are succulent to attract animals;

- Others are aromatic/scented, to attract animals;

- Seed coat of some seeds are hard and resistant to digestive enzymes and thus remain unaffected when they pass through the alimentary canal; they are dropped away from the parent plant in feaces/droppings;

**3. Wind dispersal;**

1. Censor mechanism

- Some fruits have an open/perforated capsule loosely attached on a long stalk; this is swayed by the wind; scattering the seeds;

- Some have hairs or wing-like extensions which increase their surface area for buoyancy; making it easy for them to be away by the wind;

- Some fruits/seeds are light; therefore easily carried away by the wind;

**4. Self dispersal by explosive mechanism;**

- The dry fruits have sutures/ lines of weakness; along which they split scattering seeds away from the parent plant;

Maximum 20 marks

NB:/Accept complete points properly written not sketchy outlines.