**MUMIAS WEST SCHOOLS JOINT EXAMINATION - 2022**

**BIOLOGY MARKING SCHEME**

1 a) Glomerulus; rej. glomeruli 1mk

b) It is long to increase the surface area for re absorption of water

It is lined with a network of blood capillaries to enhance re absorption of water

It is un-shaped to bring about a counter multiplier effect/to concentrate salt in the medulla to bring about re-absorption of water

c) Vasoconstriction

Hair rises Acc pilo erection for hair rising

Metabolic rate increases

Shivering

2. a) (i) Man

Xhy; (2 marks)

Woman

XHXh ;

(ii) Parental genotype

XHXh  X Xh y;

Gametes ;

Fusion

Offspring XHXh XHy XhXh Xhy ;

b) ¼ x ¼; = 1/16 (2 marks)

c) y chromosomes does not have the corresponding allele for the gene that determine or cause haemophilia/y chromosome

is almost genetically empty; (1 mark)

3. (a) Metaphase of meiosis1;

(b) A = Cell membrane;

B – Spindle fibre;

C – Centriole;

(c)

|  |  |  |
| --- | --- | --- |
|  | Mitosis | Meiosis |
| (i) | Occurs in all somatic cells | Occurs only in reproductive cells; |
| (ii) | Occurs in one phase | Occurs in 2 phases; |
| (iii) | Daughter cells produced are diploid | Daughter cells produced are haploid; |
| (iv) | Homologous chromosomes do not come together/do not pair | Homologous chromosomes come together/pair; |
| (v) | No variation at the end | Variation occurs at the end; |

(Any first 3 @ 1 Mark = 3 Marks)

(d) Crossing over;

4. (a) Pteridophyta

(b) Q

Name - Adventitious root; (reject roots)

Function - Anchorage/absorption of water

R

Name - Rhizome (underground stem)

Function - For storage of food and water

S

Name - Sorus

Function - Contains (Sporangium with a sexually

reproductive)spores

(c) Name the two body forms of the organism in its alternation of generation. (2 marks)

* + - Gametophyte
    - Sporophyte

5 (a) i) Vascular cambium ;

Found between the xylem and phloem of woody plants; cells decide to give rise to secondary xylem and phloem; resulting to increase in birth / Diametre ; secondary parenchyma ; is formed between adjacent vascular bundles resulting to secondary growth ;

ii) Cork Cambium ;

Located beneath the Epidermis; Divides to form secondary cortex ; and corky cells ; ( to the inside and outside respectively Preventing rapturing of the stem and root when vascular cambium increase in firth

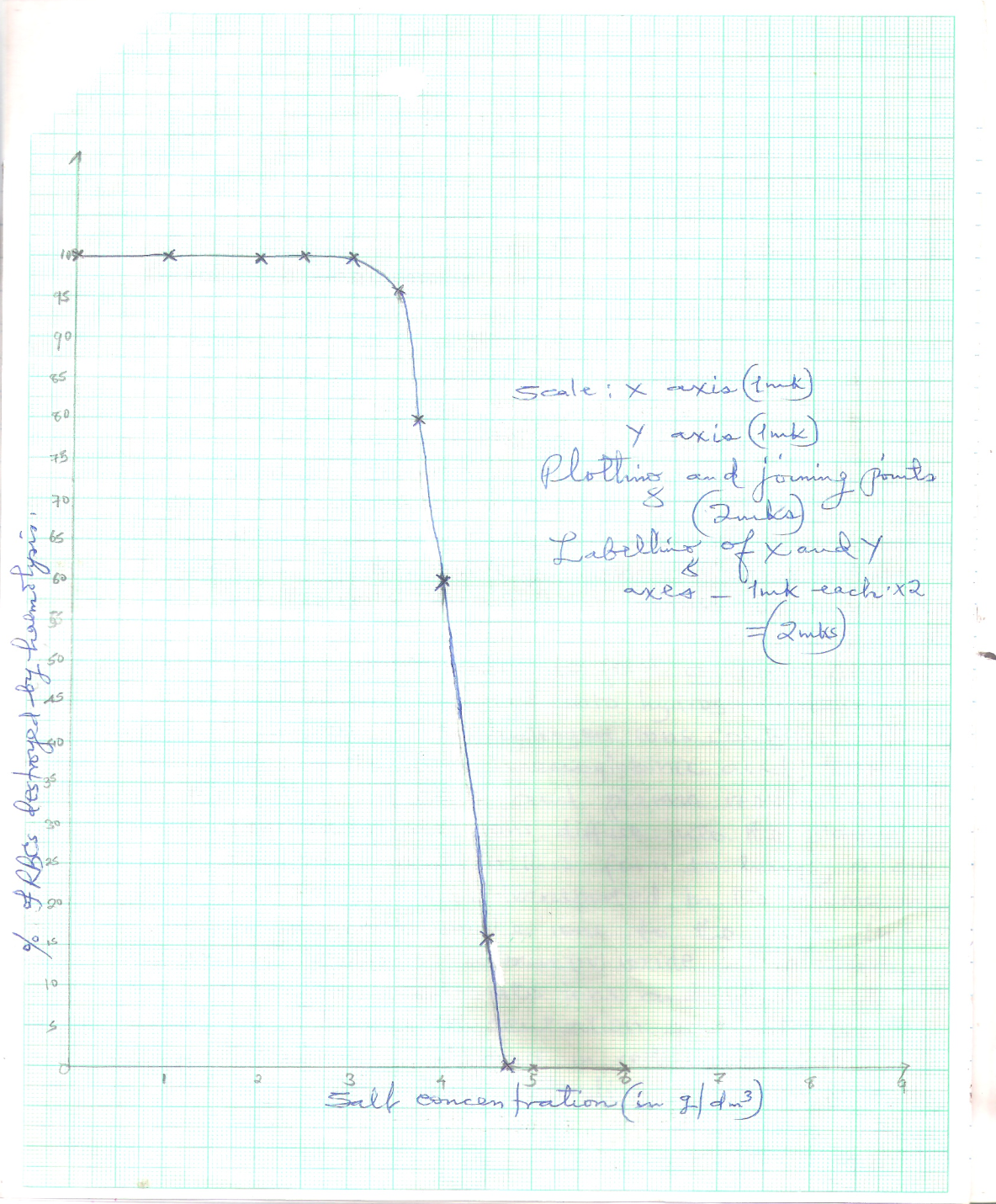
a) i) Juvenile hormone (1mk)

ii) Ecdysone / moulting hormone (1mk)

b) Prothoracic gland (1mk)

c) Instar (1mk)

6. (a) On the graph.



1. Haemolysis of red blood cells occurs when they are placed in a hypotonic solution;

they gain a lot of water; swell an then burst; (3 mks)

(c)(i) 4.1 g/dm3; + 0.1; (1 mk)

(ii) 3.0 g/dm3; + 1; (1 mk)

(d)(i) 4.7 g / dm3+ 0.1; (1 mk)

(ii) At 4.7 g / dm3 salt concentration; as there is no haemolysis / haemolysis was zero; (2 mks)

(iii) Isotonic solution; (1 mk)

(e) Osmoregulation; Rej. homeostasis (1 mk)

(f) - Osmosis enables movement of water from one cell to another;

- Osmosis helps in closing and opening of the stomata;

- Osmosis helps in support when cells become turgid in plants;

- Osmosis helps in absorption of water by the root hairs; (max 4)

7. Follicle stimulating hormone (FHS); is secreted from the anterior lobe of the pituitary gland just

after menstruation; It causes Graafian follicle to grow in the ovary; FSH also stimulates tissues

of the ovary to produce oestrogen;

Oestrogen; brings about healing and repair of endometrium; destroyed during menstruation; Accumulation of oestrogen; stimulates pituitary gland produce Luteinising hormone (LH);

Luteinising hormone (LH); stimulates maturation of graafian follicle; The manure graafian

follicle releases an ovum into funnel shaped part of the ovary; This is known as ovulation;

LH also brings about changing of graafian follicle into corpus luteum; LH then stimulates

corpus luteum to secrete progesterone;

Progesterone; stimulates thickening of the endometrium and increases blood supply to the endometrium; in preparation for implantation. When fertilisation has taken place, progesterone

levels increase and this inhibits secretion of FSH; hence no more growth of graafian follicle;*TOTAL 22 MAX 20*

1. (i) Process of inhalation in mammals

* External intercostals muscles contract; while internal intercostals muscles relax;
* (This movement) pulls ribs upwards and outwards;
* The diaphragm muscles contract; and the diaphragm flattens;
* (All the above movements) increases the volume of thoracic cavity; and decreases its pressure; Atmospheric pressure being higher than thoracic cavity pressure; Forces the air to rush into the lungs; (through the nose and trachea)
* The lungs are inflated;. (Max. 10 Marks)

(ii) During the day, chloroplast of guard cells accumulate sugar/glucose produced through the process

of photosynthesis;

* Accumulated sugar/glucose in the guard cells increases osmotic pressure of the cell sap of the guard cells;
* Water is drawn from the neighbouring epidermal cells by osmosis;
* Guard cells become turgid and bulges outward;
* This opens the stomata;
* At night, sugar/glucose which had accumulated in guard cells is converted to starch;
* Osmotic pressure of guard cells falls;
* The cells lose water to the neighbouring epidermal cells and become flaccid;
* The guard cells are drawn towards one another;
* The stomata closes; (Max 10 Marks)