**MINCKS GROUP OF SCHOOLS**

**FORM FOUR**

**END OF TERM TWO 2022**

**BIOLOGY PAPER TWO (PP2)**

**MARKING SCHEME**

**SECTION A: 40 MARKS**

1.a) Genetics – Branch of biology that deals with the study of inheritance and variation. (1mk)

b) - sex

- ABO blood group

- Toungue rolling

- free or attached earlobe

- Hairs in ear pinna / nose (2mks)

c) parental Genotype HbAHbA X HbA Hbs

Gametes

|  |  |  |
| --- | --- | --- |
| Male / Female | HbA | HbA |
| HbA | HbAHbA | HbAHbA |
| Hbs | HbAHbs | HbAHbs |

Probability of sickle cell trait (HbAHbs)

= ½; 0.5; 50%; (5mks)

2.a) X – External auditory meatus;

Y – Ear ossicles;

N – Eustachian tube;

b) They are bony/solid and small forming a lever system that amplifies and transmits vibrations to the fenestra ovalis.

They are loosely held by suspensory ligaments which enables them to transmit vibrations;

NB: Mark any one.

c)i) Maintaining body balance / posture;

ii) M; **NB:** (ii) is tied to (i)

d) Permanent deafness; rej. Deafness alone

lack of balance Mark any one

3.a)i) Epigeal germination; (1mk)

ii) Hypocotyl grows faster pulling the cotyledons above the ground; (1mk)

b) Seed coat; (1mk)

c) -protect the embryo; (1mk)

- food storage; (1mk)

d) Exposure of the curved part to light stimulates migration of auxin to the lower side; higher concentration of auxin on the lower side stimulates faster cell elongation; on the lower side than on the upper side; and this causes P to straighten. (3mks)

4.a) Cell membrane;

b)i) It encloses cell contents;

ii) It selectively allows materials in and out of the cell;

c)i) Centriole;

ii) Take part in formation of cilia and flagella.

* Take part in formation of spindle fibres during cell division

d)- Sensitive to changes in temperature and pH

- Posses electric charges / polarized

- Semi-permeability

5.a) Water; acc moisture

Temperature; acc warmth (2mks)

b) Mobilise / Activate enzymes / hydrolyse stored food / breaking of dormancy;

- softens the testa / seed coat;

- acts as a solvent / medium of transport; (3mks)

c)i) Those in set up A will geminate; (1mk)

ii) Those in set up B will not geminate; (1mk)

iii) Those in set up C will not germinate; (1mk)

**SECTION B.**

6.a) On graph paper. (7mks)

b)i) Urine 74 cm3 / hr

Sweat 14cm3 / hr 1 (2mks)

ii) Evaporation (1mk)

iii) An increase in external temperature decreases the amount of urine produced; this is due to increased sweating; which increases osmotic pressure of blood; hence more water is reabsorbed back into the blood stream at the kidney tubules. (4mks)

c) Urea

- Uric acid (3mks)

- Ammonia

d) - Aestivation

- Staying under shaded places. (3mks)

- Borrowing underground.

7.a) pollen grains land and stick onto the stigma; stigma secretes / produces a sticky fluid; that causes pollen grains to adhere onto it.

Sticky secretion also stimulates the pollen grain to germinate; into a pollen tube;

The pollen tube grows into the stigma and protrudes down the style tissues;

The pollen tube denies its nutrition from style tissues

As the tube grows downwards, the tube nucleus occupies the position just behind the tip;

The generative nucleus then enters the tube and divides mitotically; to give a pair of male gamete nuclei; which follow the tube nucleus and the pollen tube grows further doen the style.

On reaching the ovary, the pollen tube enters the ovule through the microphle;

It bursts open;

The vegetative (tube) nucleus disintegrates; leaving a clear passage for the two male gamete nuclei.

One male gamete fuses with the functional egg cell; to form a diploid zygote;

The other fuses with the two polar nuclei; to form a triploid nucleus; called primary endosperm nucleus;

b) Zygote (divides mitotically) and forms the embryo; Embryo differentiates into plumule and radicle; primary endosperm nucleus (divides mitotically) and becomes the endosperm (for food storage);

integuments become the seed coat;

antipodal nuclei and synergids disintegrate;

ovules become seeds;

ovary wall becomes the pericarp;

stigma and style dry up leaving a scar;

corolla dries up;

calyx may dry up or persist;

8.a) Searching for food / mates / shelter, (4mks)

Migration away from unfavourable conditions/ environments;

Escape from predators / enemies;

Colonization of new areas;

b) Vertebral column consists of a series of vertebrae; held together loosely so that its flexible;

Myotomes / muscles; associated with vertebral column contract and relax to produce movement;

The sideways and backwards thrust of the tail and body against water, result in resistance of the water pushing the fish sideways;

Head is inflexible; to maintain the forward thrust;

Body streamlined; to reduce resistance;

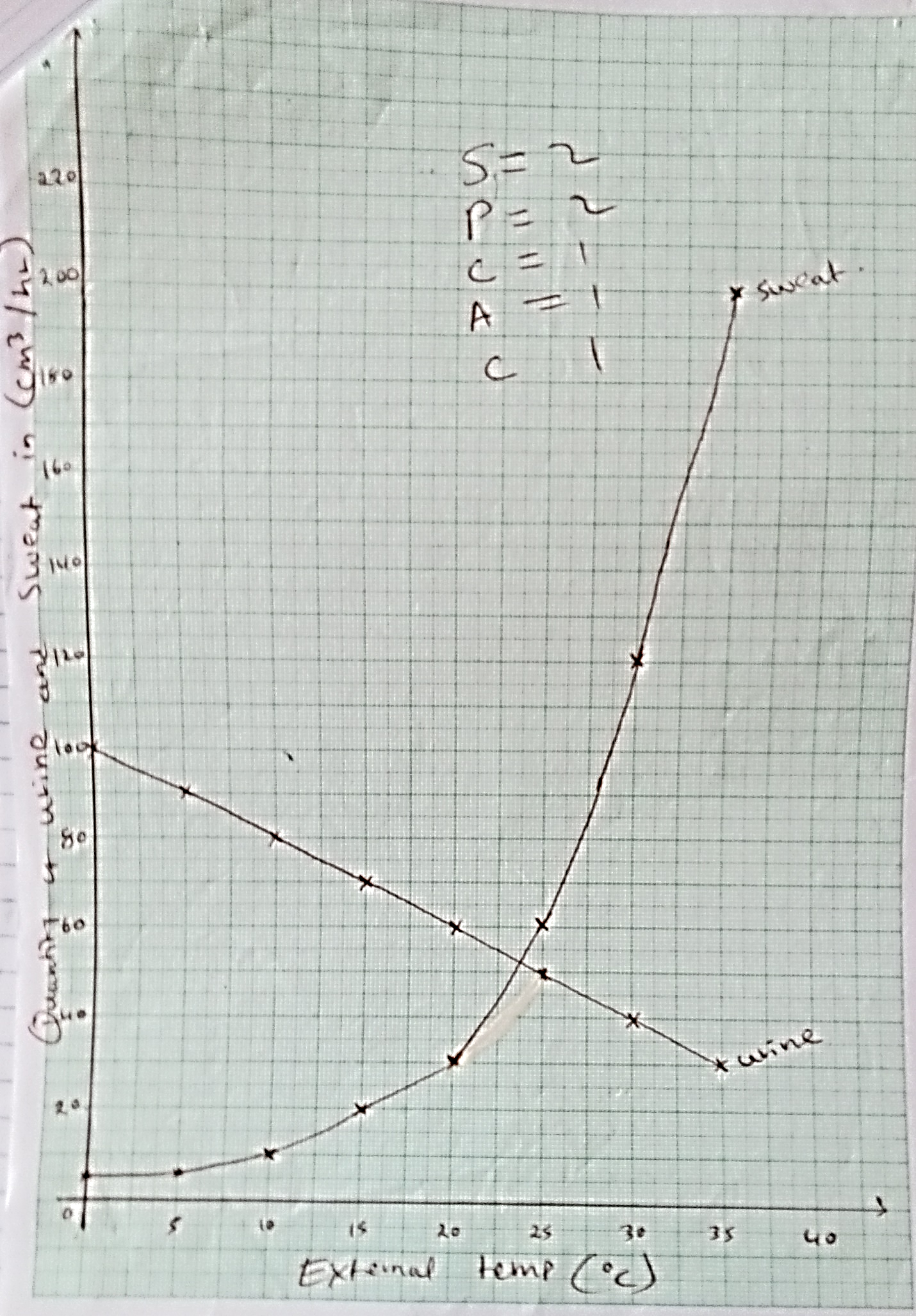
Presence of fins; for forward movement / balance in water;

Presence of swim bladder; make fish buoyant;

Scales tip towards the back; provide smooth surface to reduce resistance (friction);

Body covered with mucus making it slippery; hence reducing friction during movement in water.

*18 marks, max 16 marks*



External temp (oc)