**SET 5**

**FORM 4**

**BIOLOGY**

**PAPER 2**

**MARKING SCHEME**

a) i) XhY ✓

ii) XHXh✓

b) Parental phenotype

|  |  |  |
| --- | --- | --- |
| Parental phenotype | Haemophilic male | Carrier female |
| Parental genotype | XhY | XHXh |

|  |  |  |
| --- | --- | --- |
|  | Xh | Y |
| XH | XHXh | XHY |
| Xh | XhXh | XhY |

XHXh  - carrier daughter

XhXh - haemophilic daughter

XHY - normal son

XhY - haemophilic son

c) i) gene for haemophilia is linked to X – chromosome

ii) Females are homogametic (XX) hence can be heterozygous (carrier) or homozygous (haemophilic) for the condition.

a) Epidermal tissue

b) Cell A – epidermal cell

Cell B – Guard cell

c)

|  |  |
| --- | --- |
| **Cell A** | **Cell B** |
| Lack chloroplasts | Contain chloroplasts |
| Rectangular shaped | Bean shaped |
| No thickening on either walls | Thickened on inner walls |

d) During the day, guard cells (cell B) carry out photosynthesis forming glucose

Glucose formed increases osmotic pressure of guard cells making them to draw water from adjacent cells of epidermis by osmosis

Guard cells swell and expand leading to opening of stoma (c)

a) i) Larvae are negatively photo tactic

ii) Negative photo taxis

b) i) Curves upwards

ii) High concentration of auxins on lower side of the shoot promotes rapid growth leading to more elongation on the lower side than the upper side hence the shoot bends upwards

a) Villus

b) S – Epithelium

T – Lacteal

L – Blood capillaries

c) L – Amino acids, glucose

T – Fatty acids and glycerol

d) Supplied with blood capillaries – to transport absorbed products of digestion

Presence of lacteals – To transport fatty acids and glycerol

Lined with thin epithelium for faster absorption of products of digestion

a) Development of seed into a seedling OWTTE

b) P – Coleoptile

Q – Plumule

R – Root hair ***Rej.*** *Root hairs*

c) Hypogeal germination

d) i) Used during respiration to provide energy required for cell division and growth.

ii) Converts insoluble food forms into soluble form

Plays role in breakdown and oxidation of food substances

iii) Activates enzymes

Softens the seed coat

Hydrolyses and dissolves food materials

Provides medium for enzymes to act

Medium of transport of soluble food to growing parts

**SECTION B**

a) **Graph**

Blood pressure – Y axis

Time (Seconds) – x Axis

Curves - in Vessel B – zigzag

- in vessel A – not zigzag

**Marking**

Axes – 1 Mk

Plotting 2Mks

Smooth curve 1Mk

Identity 1Mk

Scales 1Mk

Curves 1 Mk

7mk

b) Vessels A – Pressure is low and remains fairly constant

Vessels B – Presence is high, rises and drops within a certain range

c) i) A - vein

ii) B – Artery

iii) **A** – vein, because veins have low and constant pressure without pulses while;

**B** – Is artery because it has high and has pulses which fluctuates

d) Exercise causes heart to beat faster

e)

|  |  |
| --- | --- |
| **Vessel A** | **Vessel B** |
| Wider lumen | Narrow lumen |
| Thinner muscular walls | Thicker muscular walls |
| Valves present | Has no valves |

f) i) Arteriosclerosis

Thrombosis

Hypertension

Varicose veins

ii) Fight body infection / protection

Prevent excessive bleeding / blood clotting

Thermoregulation

Osmoregulation

1. Pollen grains land on stigma; and germinates into a pollen tube;

Pollen tube grows down the style; and enters ovule; through Micropyle;

Generative nucleus; divide through mitosis; to form 2 male nuclei; one fuses with egg; cell; and other with; polar nuclei forming diploid zygote; and primary endosperm; respectively.

Zygote forms embryo; and primary endosperm forms the endosperm; of the seed.

After fertilization fertilized ovary; develops into fruit; integument into testa;

And ovules develop into seed;

Calyx / style wither and falls;

a) Pinna collects; and concentrates sound waves; into auditory meatus;

Sound waves strike ear drum; and cause it to vibrate;

Vibrations are transmitted to ear ossicles; where they are amplified;

Stapes (last ear ossicles) transmit vibrations; to oval window; and are transmitted to perilymph of cochlea;

Vibrations stimulate sensory cells hairs; to generate nerve impulse; which is transmitted by auditory nerve; to brain for interpretation;

b)

i) When there is less water in the blood, osmotic pressure is high;

More ADH is produced by pituitary gland stimulating tubules to reabsorb more water;

Osmotic pressure is lowered to normal and little amount of concentrated urine is produced;

When there is more water; in the blood osmotic pressure is low; less ADH is produced; and tubules are less stimulated; less water is reabsorbed leading to large amount of dilute urine;

ii) Insulin and Glucagon

When sugar level is high in blood; insulin is produced by pancrease; causing conversion of excess glucose by liver cells; for storage; glucose lowers to normal;

When sugar level is low; less insulin is produced; more glucagon is produced. Glucagon cause liver cells to convert glycogen to glucose; Blood sugar level is restored