**MOKASA PP2**

**MARKING SCHEME**

**1(a).Parental phenotype: premature bald headed male female**

 **Parental genotype: YB X X XX;**

 **Parental genotype: X YB  X X ;**

|  |  |  |
| --- | --- | --- |
|  | **X** | **YB** |
|  **X** | **XX** | **X YB ;** |
|  **X** | **XX** | **X YB ;** |

**(b) (i) 0%;**

 **(ii) Trait is located on the y chromosome;**

**(c)(i) Resistance to army worm/pests;early maturity;resistance to diseases;any 1**

 **(ii) Production of insulin:**

**2.(i) thigmotropism/haptotropism;**

 **(ii) Contact;**

 **(iii) contact causes lateral migration; of auxins to the other side not in contact,high conc of auxins; causes rapid cell elongangion;causing twining of the stems;**

**(iv) Support; expose leaves for photosynthesis/expose flowers to agents of pollination**

**3.(a) coloured water rises up;/drop of coloured water level in the beaker.**

**(b) The insect respired; taking up oxygen and releasing CO2;CO2 is absorbed by sodam lime/calcium hydroxide/potassium hydroxide;preassure decreases;in the flask,atmospheric pressure push water up the capillary tube;**

**(c) To maintain a constant temperature during the period of the experiment;**

**(d)mitochondrion; site for respiration that yield energy;**

**4.**

|  |  |  |
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| **Organism**  | **Steps** | **Identity**  |
| **A** | **1a,2b,5b** | **Mite ;** |
| **B** | **1b,6b,7b** | **Leech ;** |
| **C** | **1b,6a** | **Snail ;** |
| **D** | **1b,6b,7a** | **Earthworm ;** |
| **E** | **1a,2a,3a,4a** | **Housefly ;** |
| **F** | **1a,2a,3b** | **Bedbug ;** |
| **G** | **1a,2a,3a,4a** | **Dragonfly ;** |
| **H** | **1a,2b,5a** | **Cray fish;** |

**5. (a) elongated;to increase surface area for absorption of water and mineral salts;**

 **Large sap vacuole;to increase the osmotic pressure of root hair cell;**

**(b) Water molecules are high conc in the soil than in the sap vacuole of root hair cell;water molecules moves into the cell by osmosis;**

**(c) Root pressure;adhesion and cohesion force;transpiration pull;capillarity;any 2.**

**6.(a)(i) no enzymatic reaction;temp are very low;enzymes are inactive;**

 **(ii) Sharp increase in the rate of reaction;increase in temp towards optimum;increase in the activity of enzymes;**

 **(iii) Maximum rate of reaction;optimum temp range;ezyme activity is maximum;**

 **(iv) Rate of reaction slows down gradually; high temperature beyond optimum;enzyme is denatured; and enzyme becomes ineffective;**

**(v) Population decreases rapidly;enzyme is denatured;cells are killed/protoplasm is destroyed;**

**(vi)(a) acidic nature of stomach denatures the enzyme;**

 **(b) non competitive inhibitors,binds to active site permanently;**

 **(c) to prevent autodigestion;**

**7(a) utriculus; and sacculus; contain sensory cells and is responsible for maintenance of body balance and posture; in relation to gravity;when the body balance is shifted like when falling down,the fluid disturbs sensory cells;triggering a nerve impulse to the brain;via auditory nerve;brain interprets the impulse according to position of the body with respect to gravity;the brain then relays a nerve impulse; through motor neurone; to restore a correct posture;**

**(b) (i)-Water (moisture)**

 **-Activate germination enzymes/breaks seed dormancy**

 **-Provides medium for enzyme to act;**

 **-Softens seed coat, which burst open to allow emergency of radical and plumule;**

 **-Hydrolysis of food during germination;**

 **(ii) Oxygen;**

 **-Oxidation of food during respiration to provide energy for germination/cell division and formation of new tissues.**

 **(iii) Optimum temperature**

 **-Suitable for action of germination enzymes which hydrolise stored food;**

 **-Low temperature below 0o.c inactivate germination enzymes slowing down germination rate ;**

 **-High temperature above 40oc denatures germination enzymes stooping germination;**

 **(iv) -Enzymes**

 **Break down food by oxidation;**

 **(v) Viability**

 **-Refers to percentage change that a seed will germinate when planted;**

 **Only seeds with live and healthy embryo will germinate and grow;**

 **-Seeds stored for long time lose their viability;**

 **(vi)Hormones**

 **-These stimulate certain metabolic pathways in the germination process;**

 **Max x12**

 **Every condition identified 1mx6=6mrks**

 **Every explanation indentified 1mkx6=6mrks total 12 marks**

**8.(a)During inhalation,floor of the mouth cavity is lowered;by muscular contractions;volume of mouth cavity is increased; and its pressure decreases;operculum acts as a valve;to ensure that water rich in dissolved oxygen; flows only through the mouth;during exhalation,mouth closes;the floor of the mouth is raised by muscular contractions;its volume decreases ;and pressure increases;operculum bulges outwards; causing a reduction in pressure ;and increase in volume;water rich in dissolved oxygen flows over the gills;**

 **(b) 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 close**s;