KABOURA 231/2 MARKING SCHEME BIOLOGY PAPER TWO 2024

1. (a) – Adjust the mirror;
   * Ensure diaphragm is fully open;
   * Ensure the objective lens is clicked into position with the

eye piece lens; 02

[1st two correct](#_TOC_250000)

* + 1. (i) Nucleus;

(ii) Formation of ribonucleic acid/RNA; 02

Formation of ribosomes;

# Any one correct 02

* + 1. (i) Contractile vacuoles;

(ii) Golgi bodies/apparatus;

* + 1. – Tail for swimming;

- numerous mitochondria to provide energy; 02

* haploid nucleus for fertilization; 08
* streamlined to reduce friction; 01

# 1st two correct 01

1. (a) Thoracic vertebrae; 02

(b) Anterior view;

1. Name: Neural canal;

Function: Passage for the spinal cord; 04

1. (i) S : long; to provide large surface area for attachment 08

of back musles;

V: Large; to support the weight of the entire vertebral column;

1. (a)(i) Kingdom Fungi;

(ii) Are Eukaryotic;

* + Are heterotrophic; 03
  + Cells have cellwalls made up of chitin;
  + Reproduces by spore formation; 03
  + Basic unit is the hypha;

(b) Name: hypha; Rej Hyphae Function;

1. Anchorage/support;
2. Absorption of nutrients;

# 1st two correct 02

08

01

c) (i) Source of food;

(ii) Some produce chemicals that are very poisonous;

1. (a) The gene that shows out phenotypically when in a heterozygous state;

(b) Parental phenotype

1. Parental genotype

05

02

08

01

1. P (Daughter colourblind) =1/2; 03

c) - production of varieties that are resistant to insect pests;

* fruit ripening wihout becoming soft as in tomatoes;
* Introduction of genes that increases meat/milk production in cattle;
* Introduction of genes for nitrogen fixation into cereal crops to increase yield without the use of fertilizer;

1st two correct

1. (a) – Kidney A has a larger /wider medulla; Accept 04

Kidney B has a smaller/narrower medulla 08

* + Kidney A has smaller/narrower cortex; Accept

Kidney B has a larger/wider cortex

b) Kidney A has longer loop of Henle than kidney B; reason: loop of Henle is found at the medulla; Kidney A has a larger medulla hence longer loop of Henle;

acc the converse

c)

|  |  |  |
| --- | --- | --- |
|  | Habitat | Reasons |
| Animal | Desert/Arid/ | Long loop of |
| With | Semi- Arid; | Henle for |
| Kidney A |  | maximum |
|  |  | reabsorption of |
|  |  | water |
| Animal | Aquatic/ Water/ | Short loop of |
| With | marine | Henle for |
| Kidney B |  | minimum |
|  |  | reabsorption of |
|  |  | water; |

03

07

02

1. (a) graph paper
2. Water softens the hard impermeable seed coat; the water also activates the cells of the embryo and they begin

to make use of the stored food; the stored food also 02

dissolves in the imbibed water and is transported to the 20

growing plumule and radicle;

1. (i) At 6oC the temperature is lower than optimum; the enzymes are therefore inactivated; (making the percentage germination to be very low)
2. At 33oC the temperature is optimum/suitable; the enzymes are therefore activated; leading to the highest percentage germination;
3. At 51oC the temperature is higher than optimum; most enzymes are therefore denatured; (leading to a drastic decline in percentage germination)

(d)- Embryo not fully developed;

* presence of chemical inhibitors e.g abscisic Acid
* Low concentration of enzymes.

(e) – Juvenile hormone;

* moulting stimulating hormone;
* Ecdysone/Moulting hormone;

1. (a) Role of mammalian blood plasma.

# 1st two correct

*1st two correct*

* + Transport red blood cells which carry oxyhaemoglobin;

from the lungs to the tissues;

* + Transport red blood cells which carry carbaminohaemoglobin; from the tissues to the lungs;
  + Transport nitrogenious wastes/urea; from the tissues to region of elimination; Acc correct region named.
  + Transport dissolved oxygen; from the lungs to the tissues (award from the lungs to the tissue once)
  + Transport dissolved carbon iv oxide; from the tissues to the lungs ( award from tissues to lungs once).
  + Transports hormones; from gland which secrete them to their target organ; Acc correct hormone from correct gland to correct target organ.
  + Transports dissolved nutrients; from the ileum to the liver; and then from the liver to other body tissues;
  + Regulates the body PH; due to buffering action of its proteins;
  + Regulates the body temperature; by distributing heat from the liver/muscles/ other areas of production to the whole body;

# 17 maximum 10mks

(b) The mechanism of blood clotting in human beings.

* + Undamaged blood vessels/tissues contain heparin; which prevent clotting;
  + When the blood vessels/tissue get damage the platelets are exposed to air; making them to rapture; releasing enzyme thrombokinase/thromboplastin; which neutralizes heparin; vitamin K activates the formation of in active prothrombin; which is converted to thrombin; by thromboplastin under influence of calcium ions;
  + The thrombin activates the conversasion of soluble fibrinogen; into insoluble fibrin;
  + The fibrin forms a meshwork of fibres at the damaged tissues; which trap red blood cells to form a clot;

# (13 maximum 10mks)

*(30 maximum 20mks)*

1. Adaptation of insect pollinated flowers
   * The flowers are large/conspicuous; to be seen from far by the insects;
   * The petals are brightly coloured; to attract the insects;
   * They have nectar that are scented; to attract the insects (award attract insect once)
   * They have nectar guides; to enable the insect reach the nectaries;
   * The anthers are firmly attached to the filament; and do not collapse as the insects brush against them as they crawl into the flower; (thus collecting pollen grains)
   * Pollen grains are sticky/spicky/spiny; so that they stick on the body of the insect;
   * The pollen grains are also larger /heavier; to avoid being carried by wind;
   * The stigma is sticky; so that pollen grains from the body of the insect can stick on it;
   * The stigma is also found inside the flower; so that they are not exposed to wind;
   * Some corolla are funnel shaped/tubular; to ensure insect gets into contact with stamen and carpel;
   * Some flowers mimicry; to attract the (male) insect;
   * Some have landing platforms; that ensures the insect gets into contact with both anthers and stigma.

# (12 maximum 10mks)

(b) (i) Uniform light distribution causes auxins to be uniformly distributed at the zone of elongation; this leads to equal growth rate hence no curvature at the shoot; Unidirectional light causes auxins to migrate to the darker side of the shoot; this leads to rapid cell elongation hence faster growth rate at zone of elongation of the dark side; the shoot eventually curves towards the source of light;

(ii) When a shoot is not in contact with a hard object, auxins are evenly distributed at the zone of elongation; this leads to equal growth rate hence no curvature at the shoot;

When the shoot is in contact with a hard object, auxins

migrate to the part not in contact with the hard object; the outer part not incontact experiences faster growth rate due to the higher auxins concentration at the zone of elongation; the shoot eventually coils round the hard object; (10mks)

*(22maximum 20mks)*