**231/2**

**BIOLOGY**

**PAPER 2**

**TIME: 2 HOURS**

**TERM TWO 2022**

**MECS TERM 2 PAPER TWO MARKING SCHEME**

1. a) i)temperature

humidity

wind

light intensity

 **mark 1st two**

ii) temperature- low temperature reduces latent heat of vaporization

humidity- high humidity decreases diffusion gradient

wind- on a less windy day, water accumulates around the leaf reducing the diffusion gradient.

Light intensity- low light intensity the stomata are partially open.

***(answer given in (ii) should match the answer given in (ii). part (i) and (ii) is tied)***

b) transpiration pull

cohesion and adhesion force

root pressure

capillarity

 **mark 1st two**

c) i) lignin

 ii) cellulose

1. a)

blood group AB blood group O

 AB X OO;

 ;

AO

BO

BO

AO

 ;

 ;

 Her claims were true. It was the wrong baby as they could only have a child with blood group A or B;

b) i) crossing over

ii)linked genes separate; and are transmitted on different chromosomes;

1. a) A- epidermal cell rej epidermis

 B- chloroplast rej chloroplasts

b) allows transpiration to take place

 allows gaseous exchange to occur.

c)

|  |  |
| --- | --- |
| **Mesophyte leaf** | **Hydrophyte leaf** |
| Most stomata on the lower surface | Stomata on the upper surface |
| Less number of stomata | More number of stomata |
| No aerenchyma tissue | Has aerenchyma tissue |

d) presence of stomata to allow diffusion of carbon (IV) oxide into the leaf;

 palisade cells/spongy mesophyll have numerous chloroplasts that contain chlorophyll to trap light for photosynthesis;

numerous palisade cells to increase the surface area for photosynthesis;

spongy mesophyll cell irregularly arranged to create large airspaces to allow for circulation of carbon (IV) oxide;

palisade cells closely packed for maximum trapping of sunlight;

 mark 1st two

1. a) Glomerulus

b) concentration reduces; because of active reabsorption of sodium ions at the ascending loop of henle;

c) (i) Antidiuretic hormone; rej ADH acc Vasopressin

 (ii) the renal tubules will be less permeable; to water leading to less reabsorption of water; hence urine will become less concentrated/dilute;

 Max-2 mks

d) more pressure (at the glomerulus); resulting in increased ultrafiltration;

 5. a)

foxes

Toads and lizards

Carnivorous insects

Herbivorous insects

grass

foxes

Toads and lizards

spiders

Herbivorous insects

grass

 **Mark any one**

 b) (i) Grass

 (ii) carnivorous insects/herbivorous insects

 c) moles will increase in number

 stoats will increase in number

 d)light intensity decreases with depth; less light limits/reduces photosynthesis;

 temperature decreases with depth; lowering the rate of photosynthesis.

6. scale -2 mks

 Plotting- 2 mks

 Axis- 1 mk

 Labelling 1 ½ mks

 Curve- 1 ½ mks

b) 38.5 mg ± 0.5 (should be shown on the graph to score)

c) (i) There is hydrolysis of starch into simple sugars which are transported to the embryo; hydrolysed food are oxidized to release energy for respiration; hence the decrease in dry weight.

(ii) New materials are synthesized from protein; bringing about growth of embryo;

(iii) The rate of respiration is faster; than that of synthesis of new materials for growth;

(iv) First leaf has been formed and they carry out photosynthesis leading to growth;

d) (i) Embryo not fully developed/ immature embryo

 Presence of abscisic acid/ germination inhibitors

 Low concentration of hormones that stimulate germination

 Low concentration of enzymes

 Impermeable seed coat

 **any one**

 (ii) unfavourable temperature

 Absence of light/ particular wavelength

 Lack of water

 Lack of oxygen

 **Any one**

7. a) when looking at the aeroplane in the sky, the ciliary muscles relax; this causes the suspensory ligaments to become taut; the lens becomes thinner; light rays from the object are less refracted; and focused on the retina; the radial muscles of the iris relax; circular muscles contract; the pupil becomes smaller; less light enters the eye;

When going back to read a page of her book, the ciliary muscles contract; suspensory ligaments become loose; the lens becomes thicker; light rays from the object are greatly refracted; and focused on the retina; the radial muscles contract; circular muscles relax; the pupil becomes bigger; more light enters the eye;

 **Total 17 mks max 15 mks**

b) Has a cell body that has a nucleus; to control the activities of the neurone;

 Has a myelin sheath that is made up of fatty materials; to insulate the axon;

 Axon is long/extended; to transmit nerve impulse;

 Has dendrites that are extensions on the cell body; to transmit nerve impulse to adjacent neurone;

Has schwann cells that are secretory cells; that secrete myelin sheath;

Has node of ranvier; that speed up transmission of nerve impulse/amplify the impulse;

 **max 5 mks**

 t

8. a) Presence of milk in the stomach stimulates secretion of hormone gastrin; Gastrin stimulates production of gastric juice; by gastric glands; the stomach wall muscles contract and relax; mixing the milk with the gastric juice; Gastric juice contains hydrochloric acid; pepsinogen; and prorennin; hydrochloric acid activates prorennin to rennin; and pepsinogen to pepsin; rennin coagulates milk protein/converts milk protein caseinogen to casein; enzyme pepsin breaks down casein to peptides; gastric juice also contains mucus; to lubricate the food;

 ***Student should describe enzyme activation before digestion,***

 ***Conversion of milk protein before breakdown***

 **Total 14 mks max 10mks**

b) Glucose; oxidized in cells to release energy; excess is converted to glycogen; for storage in the liver/ muscle cells; excess glucose is also converted to fats for storage;

Amino acids; used in synthesis of proteins; for growth; repair of worn out tissue; some of the proteins form enzymes/ hormones; it is broken down and oxidized during periods of starvation to release energy; in the absence of glucose and lipids.

Fatty acids and glycerol; oxidized to release energy in the absence of glucose; combined to form neutral fats; which are stored underneath the skin to insulate the body against cold;

 **Total 15 mks max 10 mks**