**MARKING SCHEME**

**BIOLOGY 231/2**

**PAPER II**

**JULY/AUGUST 2016**

1. (a) Detoxification;

 (b) Liver;

 (c) Prevents ammonia from accumulating to toxic levels;

 (d) Urea;

 (e) Excess amino acids are broken down/deaminated to form amino group; which is combined with

 hydrogen atom to form ammonia;

 (f) It is transported to the kidney; where it is excreted;

1. (a) Increase in breathing rate;

 (b) (i) Lower concentration of oxygen in high attitude area; raises the demand of oxygen by body cells;

 (ii) Number of red blood cells has increased hence enough oxygen is reaching all body Cells adequately;

(c) Has a higher capacity of transporting oxygen to body cells; due to higher number of redblood cells in the body;

 (d) (i) Muscle crumps;

 Muscle fatigue

 (ii) It is completely oxidized by oxygen into water, Carbon (IV) oxide and energy/is converted into glycogen for storage;

1. (a) (i) A – Biceps

 B – Triceps

 (ii) A (Biceps) relaxes; as B (Triceps) contracts;

 (b) Hinge joint;

 (c) D – Olecranon process; E – Ulna, F - Radius.

1. (a)

Genotype Rr X rr ;

Gametes R r r r

Offspring Rr Rr rr rr

(b) Incomplete;

(c) (i) Ribonucleic acid; Rej. RNA

 (ii) Has uracil base

 (iii) Three (3);

 Reason – Has three codons.

1. (a) X – Villus; Rej. Villi

 Y – Lacteal

(b) X – Increase surface area for absorption;

 Y – Absorption of fatty acids and glycerol;

(c) Digestion;

 Absorption of end products of digestion;

(d) – Produce bile juice which contain bile salts for emulsification of fat/bile salts provide

 alkaline medium suitable for enzymes present in pancreatic juice;

(e) Produce hormones insulin and glycogen;

 Reject of one hormone is mentioned

1. (a)



 Labelling of axis – 2 each 1

 Plotting – 1

 Curve – 1

 Scale – 2 each 1

 Scale – Should have origin necessarily zero

(b) (i) 2.6 ± 0.1

 (ii) 4.5± 0.1

(c) ✓ Volume of CO2 consumed/volume of O2 liberated;

* Change in dry mass

 (d) ✓ Photolysis of water

✓ATP synthesis

 (e) (i) 40C – Rate of photosynthesis is very low; because enzymes are inactive;

 (ii) 340C –Rapid rate of photosynthesis; because of the optimum temperature for enzyme reaction.

 (iii) 600c\_very low /no photosynthesis; because high temperatures denature enzymes;

 (f) Carbon (IV) oxide concentration;

 Water availability;

1. (a) ✓ Has numerous alveoli; that provide large surface area for efficient gaseous exchange;
* Epithelial lining between alveoli wall and blood capillaries is thin; to provide a shorter diffusion distance for easy gaseous exchange;
* It is highly supplied with blood capillaries; that transport oxygen and carbon (IV) oxide to and from the body tissues respectively;
* Lungs are covered with pleural membrane; which is gas tight thus changes in pressure within the lungs can occur without external interference;
* Lungs is spongy & has numerous alveoli; that accumulate large volume of gases.

 (b) Opening

* In the guard cells there are chloroplasts; which carry out photosynthesis in the presence of light;
* During the day glucose is produced in the guard cells; this increases osmotic pressure; compared to the neighbouring epidermal; water is drawn from the epidermal cell cells into the guard cells by osmosis; their turgidity increases;
* The inner walls of guards cells are thicker than the other wall; so outer walls stretch more than the inner walls causing guard cells to bulge outwards; causing stomata to open;

Closing

* During the night there is no light; no photosynthesis takes place in the guard cells; Glucose in the guard cells is converted into starch. This lowers the osmotic pressure of the guard cells than the neighbouring cells;
* Water is then drawn from the guard cells by osmosis into the epidermal cells making them to be flaccid
* Thinner outer wall shrink and the curvature of the thicker inner wall reduces; the stomata close;
1. (a) Water dispersal
* Such seeds and fruits enclose air in them to lower their density for buoyancy;
* They have fibrous/spongy to lower the density for buoyancy;
* Have impermeable seed coat or epicarp to prevent water from entering during floatation so as to avoid rotting;
* The seeds can remain viable while in water and only germinate while on a suitable medium;

**Wind dispersal**

* They are light; and small; to be easily carried by wind currents due to lower density;
* Have developed extension which create a larger surface area; so as to be kept afloat in wind currents e.g. Parachute like structures, Wing like surface;

**Animal dispersal**

* Brightly coloured to attract animals
* Fleshy to attract animals;
* Some have hook like structures to attach on animals fur

Self-dispersal

* They have weak lines on the fruit wall along which they burst open to release seeds, which get scattered. This occurs when temperature changes suddenly.

 (b) ✓ Inner and outer integuments develops into the seed testa.

* The ovary wall forms fruit wall
* The ovule develops into seed (s)
* The corolla dries and withers away.
* The calyx may persist or dries and wither away
* Stigma and style shrivels, dries and wither away.
* The androecium (male part) shrivels dries and withers away.
* Triploid nuclei develop into primary endosperm of the seed.
* The zygote formed develops into embryo.