**231/2–BIOLOGY MARKING SCHEME PAPER 2**

1. (a) B – Sap vacuole/cell vacuole/vacuole;

 C – Tonoplast;

 D – Chloroplast;

(b) Cellulose; (1mk)

(c) Active transport.(1mk)

(d)The cell sap is hypertonic to distilled water; hence water molecules move into the cell by osmosis; making it swell and eventually burst/get haemolysed;(1mk)

2. (a) A natural unit comprising of biotic and abiotic factors whose interactions leads to stable / self-Sustaining system ;

 (b) (i) Photosynthesis ;

 (ii) Respiration;

 (c) Decomposers / decomposing bacteria / Detrivores;

 (d) **A** - (1500 + 500 + 1000) KJ = 3000KJ;

  **B** 500 - (320 +100)KJ = (500 - 420)KJ = 80KJ ;

 (e)

75% of 80KJ = 60 KJ

C = (80 - 60)KJ;

 = 20 KJ ;

3. (a) (i) Boiling tube A;

- Atmospheric air rushes in through tube R/bubbles form in the lime water;

 Lime water remains clear; (2mks)

 Boiling tube B; (1mk)-Lime water rises in tube S;

 (ii) Boiling tube A ;(1mk)-Lime water rises up tube R;

Boiling tube B (2mks)

- Bubbles of air occur in the lime water;

- Lime water turns to a white precipitate;

1. (a) (i) C;

(ii) It is the uterine wall where implantation occurs;

Part b secretes the hormones oestrogen and progesterone before 4 months of pregnancy; This role is taken over by placenta hence no active role; progesterone and oestrogen maintain pregnancy.

b(i) Treponemapallidum rej. names that are not underlined (i & ii)

- other rules spelling of binomial nomenclature

(ii) Neisserian gonorrhoea

(iii) Human immune deficiency virus rej. HIV

1. -Low chances of fertilization;

5. A – Nitrogen fixation;

 D – Absorption;

(b) Nitrite/nitrite/NO2-

(c) Denitrifyig bacteria/denitrifiers

(d) (i) Leguminous plants; acc. Legumes

 (ii) Root nodules; rej root or nodules alone

(e) Killing /reduction of decomposers

 Killing/reducing of nitrogen fixing bacteria/ microorganisms

 Destruction of leguminous plants

6. (a) Labeling of axis;; (2mks)

 - Scale ; (1mk)

 - Curves;; (2mks)

 - Plotting points;;(2mks)

1. 24ºC;
2. Sweat production increases with increase in temperature; because high

temperatures increase the vaporation rate, hence more sweat is converted to water vapour; This uses latent heat of vapourisation from the body

causing cooling;(3mks)

1. An increase in temperature decreases the amount of urine produced;

This is due to increased sweating which raises the osmotic pressure of blood; A lot of water is reabsorbed into blood in the kidney tubules resulting in the production of little, concentrated urine; (3mks)

(e)Hair - When hot, the erector pili muscle relaxes; the hair lies flat on the skin surfaceto reduce insulation and encourage heat loss;

OR - When cold, the erector pili muscles contract; causing hairs to stand; and trap a layer of warm air which insulated the body raising the body temperature; (3mks)

Blood vessels - When cold blood vessel; constrict (vasoconstriction); Less blood flows near skin surface; reducing heat loss by radiation and convection;

OR - When hot, blood vessels dilate (vasodilatation); more blood flows on the skin surface; increasing heat loss by radiation and convection

 thus cooling the body; (3mks)

 Sweat glands - When hot, sweat is released; it evaporates, taking latent heat of vapourisation from the body; hence cooling it;

OR - When cold, sweat glands release less sweat; there is less evaporation; and hence less heat loss Total (9mks) max (6mks)

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**.Wind dispersal**

-Some seeds / fruits have parachute (hair like structures extending from the seed coat / fruit wall; which increases the surface area for floating in air; to be blown over a long distance e.g. in sow thistle;

-Some seeds have papery extensions (winged seed / fruits); to increase the surface for floating in air so that they can easily be carried by wind; e.g. jacaranda; spatholea sp;

* + Some plants have ovaries which are capsule shaped; which on drying up burst open along lines of weakness thus scattering the seed, into the air; This is called censor mechanism e.g. simsim;
	+ Some seeds are light in weight; to be easily blown by wind;

# Animal dispersal

* + Having hooks on the ovary wall or calyx; which stick on the fur / clothes of animals passing by; e.g. black jack fruit; devils horsewhip fruit;
	+ Being succulent / fleshy; to attract animals to feed on them as the seeds are dispersed;
	+ Seed, having a hard indigestive seed coat; which passes through the animal’s digestive system undigested; e.g. in Guavas;
	+ Being brightly coloured when ripe; to attract animals; e.g. oranges, guavas, tomatoes;
	+ Being large in size and conspicuous; to be seen by animals easily; e.g. oranges;

# Water dispersal

* + Having fibrous walls containing many air pockets; for easy floating on water; so that it can be carried by water waves / scattered,

8(a) External intercostal muscles contract; internal intercostal muscle relax, Rib cage move

Outwards; and upwards; Diaphragm muscles contract, Diaphragm flatten; volume in thoracic cavity increases; pressure reduces.

 Atmospheric air enters the lungs; inflate (correct sequence to be followed)

(b) Guard cells havechloroplast which photosynthesises in the presence of light, to form sugar, the osmotic pressure of guard cell increases; water move from neighbouring cells into guard cells being thicker than outer walls. Causes the outer wall to stretch more resulting guard cells budging outwards.