

**4.5.3 Biology Paper 3 (231/3)**

1a)	<p>i) E – strips curved outwards; (1 mark) F – strips curved inwards; (1 mark)</p> <p>ii) E – Liquid E/water entered inner cells/mesocarp of banana peels by osmosis; the inner cells expanded faster/enlarged more/became longer/became turgid than the outer cells; (leading to the curvature outwards/outer cells did not expand); (3 marks)</p> <p>F – (More) water left inner cells/moved out (of banana peels) into liquid F (by osmosis); inner cells shrunk/became flaccid/shorter (causing inward curvature); (2 marks)</p>	<b>13 marks</b>
b)	<p>Liquid E has more solvent molecules/fewer solute molecules/hypotonic(compared to the sap in the banana peel); while liquid F is hypertonic/has more solute molecules/fewer solvent molecules/more concentrated/highly concentrated. (2 marks)</p>	
c)	<p>Outer surface(of the banana peel) is impermeable/less permeable/water-proof hence water enters or leaves only from the inner surface/while inner surface is permeable/more permeable; (1 mark)</p>	
d)	<p>i) Cell membrane/plasma membrane/plasmalemma; (1 mark)</p> <p>ii) It is semi-permeable/selectively permeable; thus allowing (selective) movement of materials in and out of the cell/has pores which allow small molecules to pass through; (2 marks)</p>	
2 (a)	<p>i) Contents of test tube A are clearer/colourless/form a solution; (1 mark)</p> <p>Contents of test tube B are cloudy/turbid/form a white precipitate/suspension/milk/colloidal suspension; (1 mark)</p> <p>ii) NaOH provided an alkaline medium/condition/optimum/best/suitable (in test tube A); suitable for action/working of enzyme P (on egg albumen); effectively digesting the egg albumen/protein; (3 marks)</p>	<b>14 marks</b>
	<p>(Contents of test tube B remained cloudy) Hydrochloric acid provided unsuitable/acidic/unfavourable medium; for the working of enzyme P, hence no break down/digestion of albumen occurred; (2 marks)</p>	
b)	<p>To provide suitable/optimum/favourable/best temperature for the working/action of enzyme P; (1 mark)</p>	
d)	<p>Control experiment; (1 mark)</p>	
e)	<p>i) Solution P is an enzyme/trypsin; protein-digesting enzyme/in the egg albumen in the alkaline medium; (2 marks)</p> <p>ii) In the duodenum; (1 mark)</p> <p>iii) It has alkaline medium/condition; (1 mark)</p>	

3

13 marks

(a) <b>Plant H leaves</b>	<b>Plant K leaves</b>
Broad/broad lamina Short leaves Net-veined/network veins/reticulate; Leaflets ovate; Compound and simple; Petiole present/compact petiole	Narrow lamina; Long leaves; Parallel-veined;  Leaves linear; Simple leaves only; Leaf sheath/ petiole absent/petiole modified into sheath;

Any (3 marks)

- b)
- i) - Upright/firm stem that exposes leaves to light/ needed for photosynthesis;  
 - Green stem that contains chlorophyll to trap sunlight/light (for photosynthesis);  
 - Stem has phloem to transport the products of photosynthesis;  
 - Stem has xylem vessels for transport of water/mineral salts needed for photosynthesis;
- Any 3
- ii) - (Many/numerous) nodes to allow for growing/propagation of the plant;  
 - Extensive/shallow/many fibrous adventitious roots (on each node) to exploit surface water/anchorage/support;  
 - Swollen stem/internode that store food;  
 - Green leaves for photosynthesis;  
 - Scaly leaves that protect the lateral buds from mechanical damage;
- (3 marks)

- c) Liquid F being hypertonic (compared to the plant's cell sap) would lose water to the soil by osmosis; eventually being dehydrated, wilt/dry up and die;
- (2 marks)

- d)
- Food for herbivores/producers/food for primary consumers;
  - Ground cover/roots bind soil;
  - Offers camouflage/home for small animals/habitat;
  - Recycling of nutrients (upon decomposition);
  - Reduce carbon (IV) oxide in the atmosphere/ carbon (IV) oxide sink;
  - Reduces green house effect;
- Any 2 (2 marks)