

**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>	13 marks
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>	14 marks
	<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	<p>(a)</p> <table border="1" data-bbox="159 156 1300 582"> <thead> <tr> <th data-bbox="159 156 730 206">Plant H leaves</th> <th data-bbox="730 156 1300 206">Plant K leaves</th> </tr> </thead> <tbody> <tr> <td data-bbox="159 206 730 582">           Broad lamina;            Short leaves            Net-veined/network veins/reticulate;            Leaflets ovate;            Compound and simple;            Petiole present/compact petiole         </td> <td data-bbox="730 206 1300 582">           Narrow lamina;            Long leaves;            Parallel-veined;              Leaves linear;            Simple leaves only;            Leaf sheath/            petiole absent/petiole modified into sheath;         </td> </tr> </tbody> </table> <p style="text-align: right;">Any (3 marks)</p>	Plant H leaves	Plant K leaves	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;	13 marks
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b)	<p>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;</p> <p style="text-align: right;">Any 3</p> <p>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;</p> <p style="text-align: right;">(3 marks)</p>					
c)	<p>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;</p> <p style="text-align: right;">(2 marks)</p>					
d)	<p>- 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;</p> <p style="text-align: right;">Any 2 (2 marks)</p>					