4.5.3 Biology Paper 3 (231/3)

1a)	i) E – strips curved outwards; (1 mark) F – strips curved inwards; (1 mark) 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) 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)	**13 marks**
b)	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)	
c)	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)	
d)	i) Cell membrane/plasma membrane/plasmalemma; (1 mark) 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)	
2 (a)	i) Contents of test tube A are clearer/colourless/form a solution; (1 mark) Contents of test tube B are cloudy/turbid/form a white precipitate/ suspension/milk/colloidal suspension; (1 mark) 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)	**14 marks**
	(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)	
b)	To provide suitable/optimum/favourable/best temperature for the working/action of enzyme P; (1 mark)	
d)	Control experiment; (1 mark)	
e)	i) Solution P is an enzyme/trypsin; protein-digesting enzyme/in the egg albumen in the alkaline medium; (2 marks) ii) In the duodenum; (1 mark) iii) It has alkaline medium/condition; (1 mark)	

3		**13 marks**
(a)	<table><tr><th>**Plant H leaves**</th><th>**Plant K leaves**</th></tr><tr><td>Broad/broad lamina Short leaves Net-veined/network veins/reticulate; Leaflets ovate; Compound and simple; Petiole present/compact petiole</td><td>Narrow lamina; Long leaves; Parallel-veined; Leaves linear; Simple leaves only; Leaf sheath/ petiole absent/petiole modified into sheath;</td></tr></table> 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/habiat; -Recycling of nutrients (upon decomposition); -Reduce carbon (IV) oxide in the atmosphere/ carbon (IV) oxide sink; Reduces green house effect; Any 2 (2 marks)	