

Assessment Schedule – 2008**Biology: Describe cell structure and function (90464)****Evidence Statement**

Q	Achievement	Achievement with Merit	Achievement with Excellence
ONE (a)	<p>Describes that rough endoplasmic reticulum has a number of ribosomes attached to it, whilst smooth endoplasmic reticulum does not.</p> <p>Comparison made or implicit. Eg, one is smooth and the other is rough because RER has ribosomes.</p>		
(b)	<p>Describes the basic function of BOTH types:</p> <p>RER: Protein synthesis is the primary function.</p> <p>OR</p> <p>SER: Synthesizes lipids / steroids / storage of calcium in muscles / (transport)</p>	<p>Reasons of why ONE is needed:</p> <p>Describes the function of one type of ER and gives reasons for why it is needed : reason must relate to muscle cells.</p> <p>Eg:</p> <p>RER : synthesis of protein : growth and repair of muscle cells / enzymes to catalyze reaction related to respiration as lots of energy needed in muscle cells</p> <p>OR</p> <p>SER : synthesis of lipids / the metabolism of carbohydrates : needed for ATP / energy production to be used in muscle cell</p> <p>OR</p> <p>releasing calcium to trigger muscle contraction</p> <p>OR</p> <p>synthesis of steroids for muscle development.</p>	
TWO (a)	<p>Effective description of the general purpose of an enzyme:</p> <p>Eg:</p> <ul style="list-style-type: none"> • Catalysts: speed up reaction • Speed up reaction / catalysts : lower activation energy / may be used more than once • Catalyse: biochemical reactions. 		

(b)	<p>Description of lock and key shape / active site / cleft : the enzyme and substrate shape match</p> <p>OR</p> <p>Description of induced fit If the active site is accessible then the reaction can occur : recognises that the active site is not rigid</p>	<p>Explanation links structure (shape of the active site, ie its specificity) to function</p> <p>Lock and Key</p> <ul style="list-style-type: none"> • active site of enzyme matches substrate shape model (diagram or description) : (implication of) change in substrate <p>AND</p> <p>Induced fit</p> <ul style="list-style-type: none"> • The active site is flexible : (enzyme/active site) changes slightly when combined with substrate. 	
(c)	<p>Description of what each factor does is in relation to enzymes or how it changes the rate. (TWO factors clearly described)</p> <p>Eg:</p> <ul style="list-style-type: none"> • Higher substrate amount : more enzyme activity / increased number of reactions (higher reaction rate). • Higher enzyme concentration : more enzymes to react with substrate / higher rate of reaction. • Coenzymes : hold molecules to the active site better / needed for reaction to occur / increase the rate of reaction. • Inhibitor / poisons : prevent many enzymes from working properly (eg. cyanide / stop reaction). <p>(Substrate and concentration could be up or down change).</p> <p>Code: F = factor described.</p>	<p>Reasons for how / why the factors alter the rate up or down: (TWO factors explained)</p> <p>Eg:</p> <ul style="list-style-type: none"> • Higher Substrate: more enzyme activity : increase number of reactions (NOT reaction rate). • Higher concentration of enzyme: more enzymes to react : greater number of reactions / reaction rates increase (NOT enzyme activity increases; ie no change in product per unit time per unit mass of enzyme). • Coenzyme: organic molecules alter the shape of the active site : more effectively combine with the substrate(s) : without them the enzymes will not work / at a very low rate of activity. • Inhibitor: alter or block the active site to prevent the enzyme-substrate complex forming : stops the reaction / a few reactions may still occur / low rate. <p>Code: F_e = factor explained</p>	<p>Discussion considers of how factor increases and decreases the reaction rate and relates to the optimum (One discussion and one explanation)</p> <p>Eg:</p> <ul style="list-style-type: none"> • Higher Substrate: more enzyme activity: increase number of reactions: until available enzyme molecules become 'saturated' and the number of reactions levels off (can be shown by a diagram). • Higher concentration of enzyme : greater number of reactions : reaction rates increase : the actual enzyme activity does not increase (ie no change in product per unit time per unit mass of enzyme). <p>Code: F_d = factor discussed</p>

THREE (a)	<p>Describes the semi-permeable membrane (spm) as one that only allows certain substances to pass through it.</p> <p>Eg: spm : controls entry : exit of substances (controls movement of substances in / out of the cell).</p>	<p>Explains why a membrane needs to be semi-permeable. Reason relates to internal balance / idea of homeostasis / control of internal environment.</p> <p>Eg: spm allows the organism to effectively control the passage of wanted and unwanted materials : to maintain the internal environment of the cell / osmotic potential.</p>	
(b)	<p>Infers a surface area to volume (SA to Vol.) effect.</p> <p>Eg: small size : large SA to Vol</p> <p>OR</p> <p>Movement of required particles takes too long to sustain life when cell is too big.</p>	<p>Explains why large SA to Vol. is needed.</p> <p>Eg:</p> <p>Idea of movement of particles / diffusion being too slow / inefficient when cell too big, therefore SA to vol. ratio is a limitation.</p>	
(c)	<p>Describes the role of the contractile vacuole</p> <p>Eg: Contractive vacuole : removes the water that enters the organism through osmosis / down concentration gradient</p> <p>OR</p> <p>Describes the functioning as: the contractile vacuole fills with water, which is then released to the outside / acts as a pump to remove excess water from the cell.</p>	<p>As Achievement and Explains that:</p> <p>Water is more concentrated on the outside of the organism in the fresh water of its habitat (the pond / lake) so water enters the organism by osmosis moving from high to low concentration.</p> <p>AND</p> <p>Explains why:</p> <p>Contractile vacuole is a pump to remove excess water</p> <p>OR</p> <p>Why cell will burst / be damaged if no contractile vacuole present.</p>	<p>As Merit and Discussion relates to the fresh water environment: (Three ideas needed)</p> <p>Water in the organism compared with water in the pond (e.g. pond is hypotonic compared with hypertonic organism)</p> <p>AND</p> <p>Contractile Vacuole is a pump (actively moves water out of the cell)</p> <p>AND</p> <p>Effect on cell if no contractile vacuole, eg cell will burst / be damaged because of the water moving into the cell due to the concentration gradient / pressure on the cell membrane.</p>
FOUR (a)	<p>Describes photosynthesis as:</p> <p>Light energy / (sunlight) : chemical energy / glucose / starch.</p> <p>OR</p> <p>Converts energy (from the sun) for use in cellular processes e.g. respiration.</p> <p>NOT food / nutrients.</p>		

<p>(b)</p> <p>Description of structure OR location of chloroplasts: (ONE needed)</p> <p>Structure</p> <ul style="list-style-type: none"> flat stacks of thylakoids / grana surrounded by stroma Chloroplasts in cells have thin membranes / large surface area <p>OR</p> <p>Location</p> <ul style="list-style-type: none"> chloroplasts are mostly in the leaves large number of chloroplasts near the top of the leaf (in the upper palisade layer) chloroplasts are found near the cell membrane of palisade cells. <p>Codes: S = structure described, L = location described.</p>	<p>Gives reasons for how photosynthesis is affected by ONE of structure and ONE of location: eg: More photosynthesis can occur because :</p> <p>ONE of Structure (S)</p> <ul style="list-style-type: none"> flat stacks of thylakoids have an increased surface area for the absorption of light stroma is a clear fluid which doesn't block the light chloroplasts have thin membranes / large surface area for absorption of light. <p>AND</p> <p>ONE of Location (L)</p> <ul style="list-style-type: none"> location of the leaf on the plant means that they are directly exposed to the light. chloroplasts, near the top of the leaf, and near the (palisade) cell membrane lead to more light being received. <p>Codes: S_e = structure explained; L_e = location explained.</p>	
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Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
<p>Total of FIVE opportunities answered at Achievement level or higher.</p> <p>5 × A</p>	<p>Total of at least SEVEN opportunities answered with THREE at Merit level or higher.</p> <p>3 × M + 4 × A</p>	<p>Total of at least EIGHT opportunities answered with ONE at Excellence level and THREE at Merit level or higher.</p> <p>1 × E + 3 × M + 4 × A</p>