

Assessment Schedule – 2005**Biology: Describe cell structure and function (90464)****Evidence Statement**

Q	Evidence contributing to Achievement	Evidence contributing to Achievement with Merit	Evidence contributing to Achievement with Excellence
1(a) 1(b)	<p>Describe ONE similar structure for absorption.</p> <p>Eg</p> <ul style="list-style-type: none"> • Large / increase SA • Projections / protruding / extensions : structures / finger like / “villi” • Thin : membrane • Large surface area : volume ratio • Small “villi” structures • Membrane <p><i>Not “little hairs”, “little finger like things”</i></p> <p>Look across both (a) and (b) for correct answers</p>	<p>Explanation of how the structure increases <u>absorption</u>.</p> <p>Eg</p> <ul style="list-style-type: none"> • surface area increased / larger area : absorption / diffusion to occur across/ more of cell in contact with molecules : <u>increased rate</u> <ul style="list-style-type: none"> - <u>More space for materials to be absorbed through membrane - faster</u> - <u>more absorbed at one time</u> • thin membrane: short time / distance • surface area increased (but total volume not increased) : membrane diffusing more for given volume – greater efficiency for the cell. • cell membrane semi / selectively permeable : allows some substances through: others not. <p><i>Not “efficient” by itself</i> <i>Not “unwanted foreign material”</i></p>	
1(c)	<p>Description of BOTH osmosis and active transport. THREE of (2 from one, one from other)</p> <p>Osmosis:</p> <ul style="list-style-type: none"> • movement of water (across a semi-permeable membrane) • down the concentration gradient / high to low • passive / no energy required. • faster with higher gradient <p>Active transport:</p> <ul style="list-style-type: none"> • uptake of ions / molecules / liquids / solids / particles / hormones / food particles / ion pump / exocytosis / endocytosis / pinocytosis / phagocytosis. • against the concentration gradient / low to high • energy required. <p><i>“Materials” OK, Achievement.</i> <i>Not “along conc”.</i></p>	<p>As for Achievement, PLUS <u>Comparison</u> made of major differences.</p> <ul style="list-style-type: none"> • Movement of materials: Osmosis – water Active transport – ions / (large) molecules / liquids / solids / particles / substance. <p>EITHER</p> <ul style="list-style-type: none"> • energy requirements: Osmosis – passive movement with concentration gradient : no energy required Active transport – Against the concentration gradient / (large) molecules : energy is required. <p>OR</p> <ul style="list-style-type: none"> • Requirement of carrier molecules / movement of membrane: Osmosis – not required Active transport – required. <p>OR</p> <p>Effect of process on cells. Eg osmosis – movement water: effect cell structure (two of) turgid / plasmolysis / flaccid / animal cell bursting AND Active Transport : materials against gradient / size eg ions / amino acids.</p> <p><i>Negates: Osmosis - water / H L gradient around wrong way.</i> <i>Active transport mistake related to “energy” negates.</i></p>	<p>Discussion of BOTH processes that links mechanism for movement: with molecule size / concentration : energy need.</p> <ul style="list-style-type: none"> • Osmosis – diffusion : water : high to low concentration : passive / no energy <p>AND</p> <ul style="list-style-type: none"> • Active transport mechanisms : energy used eg ions : ion pump / large molecules : ping pong / flip flop / <u>carrier</u> molecules (proteins) / fusing and folding of membrane <p>OR</p> <ul style="list-style-type: none"> • Active transport – against the concentration gradient : large molecules : energy is required: examples of active transport <p>OR</p> <ul style="list-style-type: none"> • Effect of process on cells : osmosis uncontrolled movement / mechanisms to cope with : active transport controlled movement : maintain constant internal environment.

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2(a)	<p>Description of TWO factors.</p> <ul style="list-style-type: none"> Temperature / enzyme concentration / substrate concentration / amount of substrate / cofactors / inhibitors / pH / acidity / toxins/poisons : example <p><i>Not "conc"</i></p>		
2(b)	<p>Description of effect of factor on enzyme activity.</p> <p>Eg Temperature (TWO ideas / bullet points)</p> <ul style="list-style-type: none"> Low temperature : low activity Higher temperature : more activity / faster activity up to optimum / more efficient reaction Higher temperature : denature / changes shape / no activity Optimum temperature : <u>most</u> activity / work best at <p>OR</p> <ul style="list-style-type: none"> Developed description <p>Eg High temp : denatured : (weak H bonds break) : 3D shape lost</p> <p>Eg high temp : faster movement enzyme : more collisions : more reactions/reduce time for reaction to complete</p> <p>Eg Substrate concentration enzyme</p> <ul style="list-style-type: none"> Increase concentration : more activity : reach optimum <p>Eg Enzyme concentration</p> <ul style="list-style-type: none"> Increase concentration : more activity <p>Eg Presence of cofactors / Inhibitors</p> <ul style="list-style-type: none"> presence or absence : active site : enzyme does / not function <p>Eg pH</p> <ul style="list-style-type: none"> change shape / active site / denature : no activity change shape / active site : activity. <p>For 2(b) Look For Evidence In Both (a) And (b)</p>	<p>Explanation of effect of factor on enzyme activity.</p> <p>Eg Temperature</p> <ul style="list-style-type: none"> Low temperature : less movement / energy : low activity Increase temperature : more movement / energy / collisions : increase activity Optimum temperature : more movement/ energy : <u>most</u> activity High Temperature : change shape / denature / loss active site : no longer function <p>Eg Concentration of substrate / enzyme</p> <ul style="list-style-type: none"> Increase concentration : more collisions : more activity : level off as reach optimum <p>Eg Presence of cofactors / inhibitors</p> <ul style="list-style-type: none"> alter shape of enzymes slightly to make active site complete : substrate can fit / bind inhibitor block active site : substrate not fit / bind <p>Eg pH</p> <ul style="list-style-type: none"> change shape : denature : loss active site / no longer function change shape : activate : activity. 	

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2(c)	<p>Description of enzyme action</p> <p>Eg</p> <ul style="list-style-type: none"> • catalysts : speed up reaction / break down glucose / molecules / sugar • are catalysts / speed up reaction : lower activation energy • speed up reaction : break down glucose / sugar • controlled energy release / series of reactions / sequence of steps • speed up reactions : reaction rate appropriate for life / to supply cells energy needs • catalysts / speed up reaction : may be used more than once. 	<p>Reason for why respiration controlled by enzymes.</p> <p>Eg</p> <ul style="list-style-type: none"> • speed up reactions : catalysts / lower activation energy : reaction rate appropriate for life • controlled energy release : damage / heat • respiration series reactions : controlled by different / specific enzymes : used more than once: allow meet energy needs cell 	
2(d)	<p>Description of structure and function enzymes</p> <ul style="list-style-type: none"> • shape / active site / <i>cleft</i> : enzyme and substrate shape <u>match</u> / accessible / reaction can occur • labelled diagram showing model (either induced fit/lock – key). 	<p>Explanation links structure (shape /active site / specificity) to function (chemical reaction/catalyst)</p> <ul style="list-style-type: none"> • active site enzyme matches substrate shape : induced fit / lock-key model (<i>diagram or description</i>) : chemical reaction can occur / lowers energy required for reaction to occur • active site / shape: not changed in a reaction: available reuse. 	
3(a)	<p>TWO organelles named correctly.</p> <ul style="list-style-type: none"> • flagellum/a • cilia • cell / plasma membrane • cytoskeleton / microtubules / microfilaments. <p><i>One incorrect, eg eye spot – more than one negates.</i></p>		
3(b)	<p>Description of function of mitochondria.</p> <ul style="list-style-type: none"> • Mitochondria are the site of respiration / release <u>energy</u>. <p>OR</p> <ul style="list-style-type: none"> • Motile cells need more <u>energy</u> to move. 	<p>Explanation links the number of mitochondria to the energy requirements of the mobile unicellular organism</p> <ul style="list-style-type: none"> • More active cells : higher energy requirements / more ATP : more mitochondria : respiration / glucose use / ATP or energy production • Or vice-versa. 	

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4(a)	<p>Description of the function of TWO cell organelles or components found in both cells.</p> <p>Eg</p> <ul style="list-style-type: none"> mitochondria: site of cellular respiration / release energy NOT “power house” ribosomes: site of protein synthesis golgi apparatus – modify / package materials / chemicals rough E.R. – protein synthesis / transport / communication smooth E.R. – transport / communication makes lipids / steroids nucleus – control cell activities / contains genetic material vacuoles – storage nucleolus – site of ribosome synthesis chromosomes – genetic material cell membrane – movement in and out of cell cytoplasm – cell contents cytoskeleton – support lysosomes – contain enzymes break down food / bacteria. 		
4(b)	<p>Description of function of chloroplast or relationship to other organelle.</p> <p>Function of chloroplast</p> <p>Eg</p> <ul style="list-style-type: none"> light energy : chemical energy / glucose photosynthesis : glucose / chemical energy <p>OR</p> <ul style="list-style-type: none"> Link to another organelle eg produce glucose which is used in respiration / mitochondria. <p>Glucose is stored as starch granules or in a large central vacuole.</p> <p>eg located near cell membrane: faster / more light energy / CO₂</p> <p><i>NOT “food”, glucose food OK.</i></p> <p><i>Negates : chloroplasts – respiration.</i></p>	<p>Explanation links the function (chemical energy produced by photosynthesis) to respiration OR use by other organelles.</p> <p>Eg</p> <ul style="list-style-type: none"> chemical energy / glucose : mitochondria : respiration / release energy <p>OR</p> <ul style="list-style-type: none"> Products link to other cell organelles Eg Oxygen : mitochondria : respiration Energy : ER to synthesise carbohydrates / transport eg located near cell membrane: faster / more light energy: faster p/s /more glucose <p>OR</p> <ul style="list-style-type: none"> Products link to overall functioning cell eg glucose : respiration : stated cell function. 	<p>Discussion makes links between photosynthesis products, respiration inputs, energy / ATP and their use in other organelles / processes</p> <p>Eg</p> <ul style="list-style-type: none"> chemical energy / glucose : mitochondria : respiration : release energy <p>AND</p> <ul style="list-style-type: none"> Products link to other cell organelles eg oxygen : mitochondria : respiration energy : ER to synthesise carbohydrates / transport. <p>Complete Merit Answer</p>

Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
<p>SIX opportunities answered at Achievement level.</p> <p>$6 \times A$</p>	<p>SEVEN opportunities answered.</p> <p>THREE at Merit level</p> <p><i>and</i></p> <p>FOUR at Achievement level.</p> <p>$3 \times M + 4 \times A$</p>	<p>SEVEN opportunities answered.</p> <p>ONE at Excellence level</p> <p><i>and</i></p> <p>THREE at Merit level</p> <p><i>and</i></p> <p>THREE at Achievement level.</p> <p>$1 \times E + 3 \times M + 3 \times A$</p>