

Question			Answer	Marks	AO element	Guidance															
20	(a)	(i)	A = combustion ✓ F = respiration ✓	2	1.2	ALLOW burning IGNORE aerobic / anaerobic															
		(ii)	more combustion / less photosynthesis ✓	1	2.6	ALLOW more burning (of fuel)															
	(b)	(i)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Glucose</th> <th style="width: 50%;">Starch</th> <th></th> </tr> </thead> <tbody> <tr> <td>monomer</td> <td>polymer</td> <td style="text-align: right;">✓</td> </tr> <tr> <td>monosaccharide</td> <td>polysaccharide</td> <td style="text-align: right;">✓</td> </tr> <tr> <td>no glycosidic bonds</td> <td>glycosidic bonds</td> <td style="text-align: right;">✓</td> </tr> <tr> <td>$C_6H_{12}O_6$ / more H and O</td> <td>$C_6H_{10}O_5$ / less H and O</td> <td style="text-align: right;">✓</td> </tr> </tbody> </table>	Glucose	Starch		monomer	polymer	✓	monosaccharide	polysaccharide	✓	no glycosidic bonds	glycosidic bonds	✓	$C_6H_{12}O_6$ / more H and O	$C_6H_{10}O_5$ / less H and O	✓	max 3	2.1 2.2	<i>Mark the first 3 responses</i> ALLOW two responses in the same box if they are on the same horizontal level ALLOW glycosidic links IGNORE 1-6 glycosidic bonds IGNORE branched
Glucose	Starch																				
monomer	polymer	✓																			
monosaccharide	polysaccharide	✓																			
no glycosidic bonds	glycosidic bonds	✓																			
$C_6H_{12}O_6$ / more H and O	$C_6H_{10}O_5$ / less H and O	✓																			
		(ii)	S / sulfur ✓	1	1.1	ALLOW sulphur															
	(c)	<p>Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question.</p> <p><i>In summary:</i> <i>Read through the whole answer. (Be prepared to recognise and credit unexpected approaches where they show relevance.) Using a 'best-fit' approach based on the science content of the answer, first decide which of the level descriptors, Level 1, Level 2 or Level 3, best describes the overall quality of the answer. Then, award the higher or lower mark within the level, according to the Communication Statement (shown in italics):</i></p> <ul style="list-style-type: none"> <i>o award the higher mark where the Communication Statement has been met.</i> <i>o award the lower mark where aspects of the Communication Statement have been missed.</i> <p>• The science content determines the level. • The Communication Statement determines the mark within a level.</p>																			

Question	Answer	Marks	AO element	Guidance
	<p>Level 3 (5–6 marks) Describes in detail the main similarities between the carbon and nitrogen cycles.</p> <p><i>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</i></p> <p>Level 2 (3–4 marks) Describes some of the key similarities between the carbon and nitrogen cycles, at least one similarity is discussed in detail.</p> <p><i>There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence.</i></p> <p>Level 1 (1–2 marks) Mentions some similarities between the carbon and nitrogen cycles.</p> <p><i>The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.</i></p> <p>0 marks <i>No response or no response worthy of credit.</i></p>	6	2.5	<p>Indicative points include</p> <p><i>AO2.5 Apply knowledge and understanding of scientific processes in a theoretical context when handling qualitative data</i></p> <ul style="list-style-type: none"> • inorganic gases <ul style="list-style-type: none"> ○ CO₂ and N₂ • in atmosphere • elements fixed to organic compounds <ul style="list-style-type: none"> ○ C and N both form proteins / nucleic acids • incorporated into plants (producers) then animals (consumers) • animals obtain element by feeding on plants • decomposing microorganisms • break down organic macromolecules in living things • release inorganic molecules <ul style="list-style-type: none"> ○ carbon dioxide and ammonium ions • microorganisms return element to atmosphere <ul style="list-style-type: none"> ○ CO₂ released during decomposition ○ N₂ released by denitrifying bacteria