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Mark Scheme (RESULTS)
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GCE

GCE Biology (6101/01)

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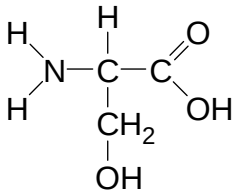
<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>1</td><td>
<table>
<tr><th>Statement</th><th>Glycogen</th><th>Cellulose</th></tr>
<tr><td>Consists of ß glucose</td><td>X</td><td>✓</td></tr>
<tr><td>Contains 1,4 glycosidic bonds</td><td>✓</td><td>✓</td></tr>
<tr><td>Is a branched molecule</td><td>✓</td><td>X</td></tr>
<tr><td>Is a structural carbohydrate</td><td>X</td><td>✓</td></tr>
</table>
Any two correct boxes for one mark
</td><td>max 4</td></tr>
</table>

Question Number	Answer	Mark
2	1. (simple) diffusion ; 2. facilitated diffusion ; 3. active transport ; 4. ATP ;	**4**

Question Number	Answer	Mark
3 (a)(i)	the {sequence / order} of amino acids ;	**1**

Question Number	Answer	Mark
3 (a)(ii)	hydrolysis ;	**1**

Question Number	Answer	Mark
3 (b)	 ;	**1**

Question Number	Answer	Mark
3 (c)		**max 3**

	Collagen	**Insulin**
1.	fibrous	globular ;
2.	three {polypeptide chains} / triple helix	two {polypeptide chains} / reference to A and B chains ;
3.	chains not held together by disulphide bonds / chains held together by hydrogen bonds	chains held together by disulphide bonds / eq ;
4.	large / about 1000 amino acids **OR** length can be variable	small / 51 amino acids **OR** fixed / precise length ;
5.	repetitive / repeating sequence / eq	no repetitive sequence ;

Question Number	Answer	Mark
4 (a)	1. reference to (same / similar) cells ; 2. of similar {structure / common origin / function} / eq ;	**2**

Question Number	Answer	Mark
4 (b)	1. correct dimensions ; 2. folded inner lining ; 3. 5 or 6 tissues shown with no cell details ;	**3**

Question Number	Answer	Mark
5 (a)(i)	cell in anaphase correctly identified ;	**1**

Question Number	Answer	Mark
5 (a)(ii)	cell in telophase correctly identified ;	**1**

Question Number	Answer	Mark
5 (a)(iii)	2 / 3 ;	**1**

Question Number	Answer	Mark
5 (b)	1. idea that during prophase {chromosomes / chromatids} (becoming) visible ; 2. idea of centrioles move to opposite poles ; 3. reference to formation of {spindle /spindle-fibres / microtubules} ; 4. disappearance of nucleolus / nucleoli ; 5. breaking down of nuclear {envelope / membrane} (in prophase) or nuclear envelope is broken down by metaphase / eq ; 6. (at metaphase) {chromosomes / centromeres} attached to spindle (fibres) ; 7. idea of {chromosomes / chromatids} lined up at equator ;	**max 5**

Question Number	Answer	Mark
6 (a)	1. {envelope / double membrane} clearly shown ; 2. granum clearly shown ; 3. {granum / thylakoid(s)} labelled ; 4. {stroma / ribosomes / starch grain / DNA / lipid droplet / {double / inner / outer} membrane / envelope / intergranal lamellae} correctly labelled ;	**4**

Question Number	Answer	Mark
6 (b)(i)	1. correct length ; 2. divided by 50 000 ; 3. correct length in μm ;	**3**

Question Number	Answer	Mark
6 (b)(ii)	vacuoles / vesicles / lysosomes / glycogen granules / ribosomes / lipid droplets / centrioles / spindle fibre / microtubules ;	**1**

Question Number	Answer	Mark
6 (b)(iii)	{resolution not high enough / eq} / damage / {angle of section / eq} / {poor printing of photograph / eq} ;	**1**

Question Number	Answer	Mark
7 (a)	1. reference to use of {iodine solution / iodine in potassium iodide} ; 2. {observation / colour change} described ; 3. credit any valid experimental details ;	**3**

Question Number	Answer	Mark
7 (b)	1. overall decrease in activity ; 2. increasing concentration up to 4 au increases the activity of amylase ; 3. increasing concentration from 4 au (to 32 au) reduces activity ; 4. reference to change in activity at 20 au ; 5. correct manipulation of data ;	**max 3**

Question Number	Answer	Mark
7 (c)	1. {copper ions / inhibitor} block the active site / eq ; 2. idea that inhibitor is the same shape as substrate ; 3. preventing {starch / substrate} binding with {amylase / active site / enzyme} ; 4. the more {copper ions / inhibitor} the more active sites are blocked ; 5. reduces enzyme activity / eq ;	**max 3**

Question Number	Answer	Mark
7 (d)(i)	1. it allows a comparison to be made (with and without copper ions) ; 2. reference to {starch / substrate} concentration being the same (with and without copper ions) ; 3. the rate of reaction changes with time /eq ; 4. because substrate is being used up / eq ;	**max 2**

Question Number	Answer	Mark
7 (d)(ii)	idea that the {maximum rate/ V_{max}} (with copper ions present) is lower (than without inhibitor) / if it was active site-directed it would take longer to reach same maximum rate ;	**1**

Question Number	Answer	Mark
8 (a)	**A** phosphate **B** deoxyribose ;	**1**

Question Number	Answer	Mark
8 (b)(i)	Adenine 29, Guanine 21, Cytosine 21 ;	**1**

Question Number	Answer	Mark
8 (b)(ii)	1. a purine always bonds to a pyrimidine ; 2. % thymine must equal % adenine / eq ; 3. guanine and cytosine must make up rest of molecule / eq ; 4. % guanine = % cytosine / eq ;	**max 3**

Question Number	Answer	Mark
8 (c)	1. DNA contains genetic information / eq ; 2. DNA codes for protein / eq ; 3. a change in DNA could produce a different {protein / mRNA} / eq ; 4. idea that it is required throughout life (or {cell / organism}) ; 5. idea that it is needed to pass on to next generation (of {cell / organism}) ;	**max 2**

Question Number	Answer	Mark
8 (d)	1. part of the DNA (molecule) unwinds ; 2. DNA strands separate / {hydrogen / H} bonds break ; 3. idea only one strand acts as a template ; 4. (free) nucleotides line up against DNA ; **OR** reference to complementary base pairing / correct description ; 5. correct reference to RNA polymerase ; 6. reference to {nucleotides joining together / formation of phosphodiester bonds} ; 7. (to form) mRNA ; 8. exits through nuclear pore / from nucleus to cytoplasm / movement to ribosomes ;	**max 5**

PAPER TOTAL: 60 MARKS