

## **Mark Scheme for June 2010**

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Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

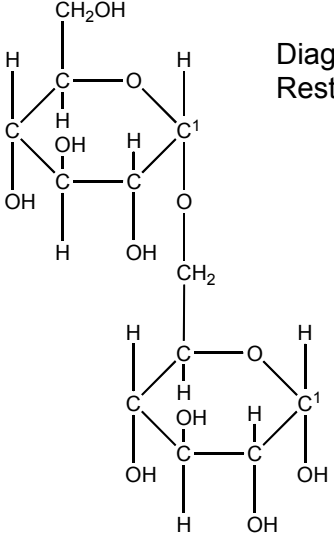
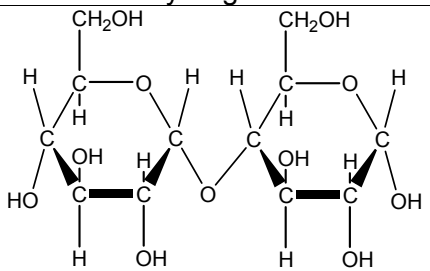
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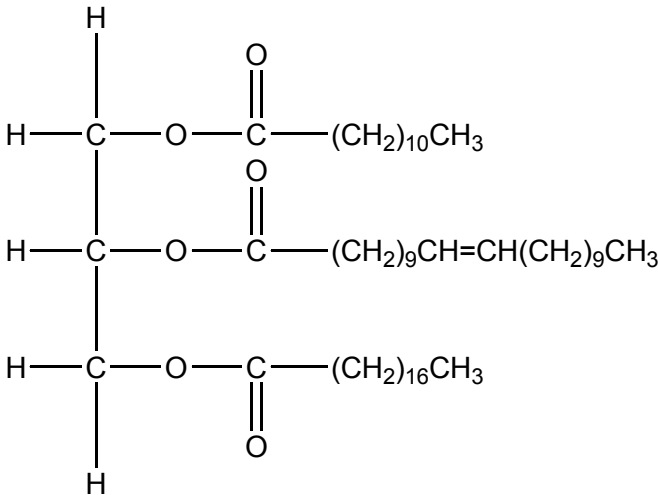
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Question	Expected Answers	Marks
1(a)(i)	 <p>Diagram showing correct 1<math>\alpha</math>-6-glycosidic linkage ✓ Rest of the molecule correct ✓</p>	2
1(b)	<p>Isomaltose has many (exposed) –OH groups ✓ These can hydrogen bond with water ✓</p>	2
1(c)(i)	 <p>structure correct ✓ (Wedge bonds not required)</p>	1
(c)(ii)	1 $\alpha$ -4 / glycosidic ✓	1
1(c)(iii)	<p>Amylose is an energy storage polymer found in plants. ✓</p> <p>Any 2 from ✓✓</p> <ul style="list-style-type: none"> <li>It is compact, forms helical coils and so takes up little space.</li> <li>It is insoluble and so cannot move outside the cell in which it is stored</li> <li>(1<math>\alpha</math>-4 glycosidic links) easily hydrolysed by enzymes releasing soluble glucose molecules.</li> <li>Large numbers of glucose molecules can be stored without increasing the osmotic pressure inside the cell</li> </ul>	2
	<b>Total</b>	<b>9</b>

Question	Expected Answers	Marks
2(a)(i)	Carboxyl or carboxylic acid ✓ Amine <b>Both required for one mark</b>	1
2(a)(ii)	$  \begin{array}{ccccccc}  & \text{H} & & \text{O} & & \text{H} & & \text{O} & & \text{H} \\  &   & &    & &   & &    & &   \\  \text{H}_2\text{N} & - \text{C} & - & \text{C} & - & \text{N} & - & \text{C} & - & \text{C} & - & \text{N} & - & \text{C} & - & \text{COOH} \\  &   & & & &   & & & &   & &   \\  & \text{CH}_2\text{SH} & & & & \text{CH}(\text{CH}_3)_2 & & & & \text{CH}_2 & & \text{CH}(\text{CH}_3)_2 \\  & & & & & & & & & & & & & & & \\  & & & & & & & & & & & & & & & \text{cys-val-leu}  \end{array}  $ <p>Both peptide bonds clearly shown ✓ Rest of the molecule correct with ends closed. ✓</p>	2
2(b)	$  \begin{array}{c}  \text{H} \\    \\  \text{H}_2\text{N} - \text{C} - \text{COO}^- \\    \\  \text{CH}_2\text{CH}_2\text{COO}^-  \end{array}  $ <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">         1 OH group ionised ✓           2<sup>nd</sup> OH group ionised and rest of the molecule correct ✓       </div>	2
2(c)	Simple diagram of a helical arrangement of a polypeptide chain ✓  Hydrogen bonding ✓ between C=O and a N-H groups ✓ from two peptide linkages All marks can be obtained from a diagram.	3
2(d)(i)	van der Waals' / instantaneous dipole-induced dipole(IDID) forces ✓ (Not hydrophobic)	1
2(d)(ii)	Disulphide bridge or covalent bond ✓	1
2(d)(iii)	Van der Waals /hydrogen bonding. ✓	1
2(e)	van der Waals'/IDID (accept hydrophobic the second time) ✓	1
	<b>Total</b>	<b>12</b>



Question	Expected Answers	Marks
4(a)(i)	The triplets of bases do not include thymine or the triplets of bases include uracil which is not in DNA ✓	1
4(a)(ii)	Two marks from: DNA is a double stranded polynucleotide whereas RNA is a single stranded polynucleotide. ✓ DNA contains deoxyribose as the sugar, RNA contains ribose. ✓ DNA strand is longer than RNA strand. ✓	2
4(b)	ser-lys-val-pro ✓✓ one incorrect base scores 1	2
4(c)	3 or new strand is arg-lys-cys-leu ✓	1
4(d)(i)	Glycerol or propane-1,2,3-triol ✓	1
4d(ii)	 <p>Ester linkages fully shown ✓ Rest of structure correct ✓ – fatty acid chains can be in any position</p>	2
<b>Total</b>		<b>9</b>

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