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|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>1(a)</b> | C<br><br>The only correct answer is C.<br><br><i>A is incorrect because amino acids are not found in DNA</i><br><i>B is incorrect because a mutation is a change in DNA</i><br><i>D is incorrect because there are no bases in protein</i>                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                            | <b>(1)</b> |
| <b>1(c)</b> | An answer that includes three of the following points:<br><br><ul style="list-style-type: none"> <li>as age increase the number of cases increases (in both males and females) (1)</li> <li>up to 57 years of age {males and females have a similar number of cases / females have a higher incidence} (1)</li> <li>above 57 the number of cases is higher in males (1)</li> <li>onset of cancer is later in males than females (1)</li> </ul> | <b>ACCEPT</b> converse where appropriate<br><b>ACCEPT</b> men and women throughout<br><br><b>ACCEPT</b> positive correlation<br><b>IGNORE</b> risk for cases<br><br><b>ACCEPT</b> 58<br><br><b>ACCEPT</b> 58<br><b>NB</b> penalise wrong age once<br><br><b>IGNORE</b> just figures quoted | <b>(3)</b> |

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| <b>2</b>    | An answer that includes the following points (in order):<br><br><ul style="list-style-type: none"> <li>dipolar (1)</li> <li>positive (1)</li> <li>solvent (1)</li> <li>hydrolysis (1)</li> <li>lactose (1)</li> </ul>                                                                                                                                                                     | <b>ACCEPT</b> dipole / polar<br><br><b>ACCEPT</b> medium<br><br><b>DO NOT ACCEPT</b> hydration<br><br><b>DO NOT ACCEPT</b> lactase / other named molecules                                                                                                                     | <b>(5)</b> |
| <b>3(a)</b> | The correct answer is <b>C</b> , fibrin<br><br><i>A is incorrect because cholesterol is not part of the wound</i><br><i>B is incorrect because collagen is inside the artery wall</i><br><i>D is incorrect because fibrinogen is soluble</i>                                                                                                                                              |                                                                                                                                                                                                                                                                                | <b>(1)</b> |
| <b>3(b)</b> | The correct answer is <b>A</b> , 1<br><br><i>B is incorrect because prothrombin is the only inactive enzyme precursor in the list</i><br><i>C is incorrect because prothrombin is the only inactive enzyme precursor in the list</i><br><i>D is incorrect because prothrombin is the only inactive enzyme precursor in the list</i>                                                       |                                                                                                                                                                                                                                                                                | <b>(1)</b> |
| <b>3(d)</b> | An explanation that includes three of the following points:<br><br><ul style="list-style-type: none"> <li>to keep thromboplastin separate from prothrombin (1)</li> <li>so that prothrombin will not be converted into thrombin (1)</li> <li>the blood clotting process will be prevented (1)</li> <li>to have thromboplastin {available / released quickly} (when needed) (1)</li> </ul> | <b>ACCEPT</b> other descriptions of what will not happen e.g. fibrin will not be formed<br><b>ACCEPT</b> will be at a high concentration (when needed)<br><br><b>NB</b> award mps if candidate clearly states what would happen if the thromboplastin was NOT inside platelets | <b>(3)</b> |

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| <b>4(a)(i)</b>  | The correct answer is <b>B</b><br><br><i>A is incorrect because the aorta takes blood away from the left hand side of the heart</i><br><i>C is incorrect because pulmonary vein returns blood to the left hand side of the heart</i><br><i>D is incorrect because the vena cava returns blood to the right atrium</i>                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>(1)</b> |
| <b>4(b)(i)</b>  | <ul style="list-style-type: none"> <li>values read from the graph and subtracted to give the time for one heart beat (1)</li> <li>75.0 (1)</li> </ul>                                                                                                                                                                                                                                                                                   | 0.8 / any pair of values that give 0.8 when subtracted<br><br><b>DO NOT ACCEPT</b> 75<br>ECF from mp 1 if values correspond to readings from graph<br><br>Bald answer of 75.0 = 2 marks<br>Bald answer of 75 = 1 mark                                                                                                                                                                                                                                                                                               | <b>(2)</b> |
| <b>4(b)(ii)</b> | An answer that includes three of the following points:<br><br><ul style="list-style-type: none"> <li>graph will be {the same / similar in} {shape / position} (1)</li> <li>because the left hand side and right hand side beat simultaneously (1)</li> <li>peaks will be lower (1)</li> <li>because pressure in right hand side is lower {as blood is only pumped to <u>lungs</u> / to prevent damage to <u>alveoli</u>} (1)</li> </ul> | <b>NB</b> 'It' refers to the line for the right ventricle<br><b>NB</b> accept converse where appropriate<br><br><b>ACCEPT</b> line<br><br><b>ACCEPT</b> description e.g. both ventricles contract at the same time<br><br><b>IGNORE</b> graph lower down<br><br><b>ACCEPT</b> because right ventricle has {less muscle / thinner walls} as blood is only pumped to <u>lungs</u> less force to <u>lungs</u><br><br><b>NB</b> If candidate says that there is something drawn on the graph you must send it to review | <b>(3)</b> |

| 5(a)          | <table border="1"> <thead> <tr> <th>Polymer</th><th>Monomer</th><th>Elements in monomer</th><th>Type of bond</th></tr> </thead> <tbody> <tr> <td>Carbohydrates</td><td>monosaccharide</td><td>carbon, hydrogen and oxygen</td><td>glycosidic</td></tr> <tr> <td>Nucleic acids</td><td>(mono)nucleotide</td><td>carbon, hydrogen, oxygen, phosphorus and nitrogen</td><td>phosphodiester</td></tr> <tr> <td>Proteins</td><td>amino acid</td><td>carbon, hydrogen, oxygen, (sulfur) and nitrogen</td><td>peptide</td></tr> </tbody> </table> | Polymer                                           | Monomer        | Elements in monomer | Type of bond | Carbohydrates | monosaccharide | carbon, hydrogen and oxygen | glycosidic | Nucleic acids | (mono)nucleotide | carbon, hydrogen, oxygen, phosphorus and nitrogen | phosphodiester | Proteins | amino acid | carbon, hydrogen, oxygen, (sulfur) and nitrogen | peptide | <p><b>ACCEPT</b> chemical symbols C, H, O</p> <p><b>ACCEPT</b> chemical symbols C, H, O, N, S</p> | (4) |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|----------------|---------------------|--------------|---------------|----------------|-----------------------------|------------|---------------|------------------|---------------------------------------------------|----------------|----------|------------|-------------------------------------------------|---------|---------------------------------------------------------------------------------------------------|-----|
| Polymer       | Monomer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Elements in monomer                               | Type of bond   |                     |              |               |                |                             |            |               |                  |                                                   |                |          |            |                                                 |         |                                                                                                   |     |
| Carbohydrates | monosaccharide                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | carbon, hydrogen and oxygen                       | glycosidic     |                     |              |               |                |                             |            |               |                  |                                                   |                |          |            |                                                 |         |                                                                                                   |     |
| Nucleic acids | (mono)nucleotide                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | carbon, hydrogen, oxygen, phosphorus and nitrogen | phosphodiester |                     |              |               |                |                             |            |               |                  |                                                   |                |          |            |                                                 |         |                                                                                                   |     |
| Proteins      | amino acid                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | carbon, hydrogen, oxygen, (sulfur) and nitrogen   | peptide        |                     |              |               |                |                             |            |               |                  |                                                   |                |          |            |                                                 |         |                                                                                                   |     |
| 5(b)          | <p>A description that includes three of the following points:</p> <p><b>TWO FROM</b></p> <ul style="list-style-type: none"> <li>• (one) glycerol and three fatty acids (1)</li> <li>• joined by {condensation reaction / ester bond} (1)</li> <li>• by enzymes (1)</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>• (at least) one fatty acid is {unsaturated / has a CC double bond} (1)</li> </ul>                                                                                                                  |                                                   | (3)            |                     |              |               |                |                             |            |               |                  |                                                   |                |          |            |                                                 |         |                                                                                                   |     |