

Theme	Topic	You should be able to:	Checklist	Comments
<b>B. Biological molecules</b>	Structure of carbohydrates, lipids and proteins and their roles in living organisms  Water and living organisms	<ul style="list-style-type: none"> <li>• *carry out tests for reducing and non-reducing sugars (including semi-quantitative use of the Benedict's test), the iodine in potassium iodide solution test for starch, the emulsion test for lipids and the biuret test for proteins;</li> <li>• describe the ring forms of <math>\alpha</math>-glucose and <math>\beta</math>-glucose (candidates should be familiar with the terms <i>monomer</i>, <i>polymer</i> and <i>macromolecule</i>);</li> <li>• describe the formation and breakage of a glycosidic bond with reference both to polysaccharides and to disaccharides including sucrose;</li> <li>• describe the molecular structure of polysaccharides including starch (amylose and amylopectin), glycogen and cellulose and relate these structures to their functions in living organisms;</li> <li>• describe the molecular structure of a triglyceride and a phospholipid and relate these structures to their functions in living organisms;</li> <li>• describe the structure of an amino acid and the formation and breakage of a peptide bond;</li> <li>• explain the meaning of the terms <i>primary structure</i>, <i>secondary structure</i>, <i>tertiary structure</i> and <i>quaternary structure</i> of proteins and describe the types of bonding (hydrogen, ionic, disulfide and hydrophobic interactions) that hold the molecule in shape;</li> <li>• describe the molecular structure of haemoglobin as an example of a globular protein, and of collagen as an example of a fibrous protein and relate these structures to their functions (the importance of iron in the haemoglobin molecule should be emphasised). A haemoglobin molecule is composed of 2 alpha (<math>\alpha</math>) chains and 2 beta (<math>\beta</math>) chains, although when describing the chains the terms <math>\alpha</math>-globin and <math>\beta</math>-globin may be used. There should be a distinction between collagen molecules and collage fibres);</li> <li>• describe and explain the roles of water in living organisms and as an environment for organisms.</li> </ul>		