

A-Level Biology

Name: _____ Score: _____

1. A sample is heated with Benedict's solution and turns brick-red. This shows the presence of:
 - ☐ a lipid
 - ☐ starch
 - ☐ a reducing sugar
 - ☐ a protein
2. Which is a monosaccharide?
 - ☐ starch
 - ☐ glycogen
 - ☐ sucrose
 - ☐ glucose
3. A triglyceride is made from:
 - ☐ one glycerol and three fatty acids joined by ester bonds
 - ☐ glucose units joined by glycosidic bonds
 - ☐ three glycerols and one fatty acid
 - ☐ amino acids joined by peptide bonds
4. The bond that joins two amino acids is a:
 - ☐ ester bond
 - ☐ peptide bond, formed by condensation (water removed)
 - ☐ hydrogen bond
 - ☐ glycosidic bond
5. Water is a polar molecule that forms hydrogen bonds.
 - ☐ True ☐ False
6. Orange-brown iodine solution turns blue-black. This detects:
 - ☐ a reducing sugar
 - ☐ a lipid
 - ☐ starch
 - ☐ a protein

7. Sucrose is a non-reducing sugar, so it gives a negative Benedict's test unless it is first hydrolysed.

☐ True ☐ False

8. Glycerol joins each fatty acid by an _____ bond, formed by condensation.

9. A protein made of two or more polypeptide chains joined together has a _____ structure.

10. The weak attractions between water molecules, caused by its polarity, are called _____ bonds.

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1. **a reducing sugar**

Heating with Benedict's detects reducing sugars. A green, yellow, orange or brick-red precipitate can be positive; brick-red is not required for every positive result.

2. **glucose**

Glucose is a single sugar unit (monosaccharide); sucrose is a disaccharide; starch and glycogen are polysaccharides.

3. **one glycerol and three fatty acids joined by ester bonds**

A triglyceride = 1 glycerol + 3 fatty acids, joined by ester bonds (each forms by condensation).

4. **peptide bond, formed by condensation (water removed)**

Amino acids join by peptide bonds, formed by condensation with the loss of one water molecule.

5. **True**

Polarity (a slightly negative oxygen and slightly positive hydrogens) lets neighbouring molecules form hydrogen bonds, which explain water's properties.

6. **starch**

The iodine test detects starch – the orange-brown solution turns blue-black.

7. **True**

Glucose and maltose are reducing sugars (positive Benedict's); sucrose is non-reducing, so you must hydrolyse it (acid + heat) first.

8. **ester**

Three ester bonds form, removing three water molecules in total.

9. **quaternary**

Quaternary structure is two or more chains in one protein – e.g. haemoglobin (four chains).

10. **hydrogen**

Each $\delta+$ hydrogen is attracted to a $\delta-$ oxygen of a neighbour – a hydrogen bond. Many of these give water its special properties.