

## Model Answers: Easy

1

The correct answer is **D** because:

- Reducing sugars (monosaccharides and some disaccharides) form coloured precipitates in the presence of Benedict's solution
- The higher the concentration of reducing sugars in a sample, the more concentrated the coloured precipitate produced (brick-red)
- Only glucose in the list above is a reducing sugar

<b>A</b> is incorrect as	sucrose is a non-reducing sugar (you need to know this one!)
<b>B &amp; C</b> are incorrect as	cellulose and starch, being polysaccharides, are not reducing sugars.

2

The correct answer is **B** because:

- Amylose is a polysaccharide of  $\alpha$ -glucose, one of two polysaccharides found in starch (the other is amylopectin)
- Amylose is, therefore, a carbohydrate and would not give a positive purple biuret test result

**A & D** are examples of enzymes which are proteins, as is **C** - haemoglobin.

3

The correct answer is **B** because Benedict's solution contains copper sulfate ions, as a result of this it is blue. Insoluble copper (I) oxide is formed in the presence of reducing sugars, forming coloured precipitates. A positive test result is any change away from the blue colour of Benedict's solution.

There is a colour scale formed from blue to brick-red depending on the concentration of reducing sugars present in the solution.

4

The correct answer is **C** because:

- The biological molecule shown is a triglyceride, the most common type of lipid
- Lipids are nonpolar substances that are soluble (able to dissolve) in ethanol (an organic solvent) but not water
- Ethanol is miscible in water (so a solution containing a mixture of ethanol and water will appear transparent) but any lipids present in the ethanol will not remain dissolved in it when added to water; they form tiny droplets throughout the mixture (this is an emulsion).

<b>A</b> is incorrect as	Biuret's reagent is used to test for the presence of proteins.
<b>B</b> is incorrect as	Benedict's is used to test for the presence of reducing sugars.
<b>D</b> is incorrect as	iodine in potassium iodide is used to test for the presence of starch.

5

The correct answer is **B** because:

- Lipids are nonpolar substances that are soluble (able to dissolve) in ethanol (an organic solvent) but not water
- Ethanol is miscible in water (so a solution containing a mixture of ethanol and water will appear transparent) but any lipids present in the ethanol will not remain dissolved in it when added to water; they form tiny droplets throughout the mixture (this is an emulsion) indicating a positive test result.

6

The correct answer is **B** because:

- A lilac observation for the biuret test is a positive result for a protein
- A blue-black observation when iodine in potassium iodide was added is a positive result for starch
- Answer **B** has starch and amylase (an enzyme, which is a protein)

7

The correct answer is **B** because:

- The biological molecule shown is a tripeptide, a protein
- When mixed with Biuret solution (which contains sodium hydroxide or potassium hydroxide to make the solution alkaline, and copper (II) sulfate ions to react with any protein present) protein molecules form a purple complex
  - For a positive test result, there needs to be at least two peptide bonds present in the sample, so the biuret test would not give a positive result for amino acids or dipeptides

<b>A</b> is incorrect as	Benedict's is used to test for the presence of reducing sugars.
<b>C</b> is incorrect as	ethanol and water are used to test for the presence of lipids (this is the emulsion test).
<b>D</b> is incorrect as	iodine in potassium iodide is used to test for the presence of starch.

8

The correct answer is **D** because:

- The molecule shown is a polysaccharide of glucose called amylose, a constituent of starch.
- Amylose molecules form long, spiralled structures, along the centre of which iodine molecules can fit into, forming a complex with a strong blue-black colour.

<b>A</b> is incorrect as	Benedict's is used to test for the presence of reducing sugars.
<b>B</b> is incorrect as	sodium hydroxide and copper (II) sulfate are the reagents in the biuret test to test for proteins.
<b>C</b> is incorrect as	ethanol and water are used to test for the presence of lipids (this is the emulsion test).

9

The correct answer is **A** because:

- Steps **1** and **3** are necessary to hydrolyse the glycosidic bond in a non-reducing disaccharide and then create the slightly alkaline solution needed for a reaction to occur with copper (II) sulfate
- The hydrolysed mixture then needs to be heated with copper (II) sulfate (in Benedict's solution) to produce a colour change when the sugar reduces copper (II) sulfate

10

The correct answer is **A** because:

- Sucrose is a non-reducing sugar that will not test positive for the Benedict's test
- The test for non-reducing sugars involves carrying out acid hydrolysis before the Benedict's test

**B, C** and **D** are reducing sugars that would test positive for the Benedict's test both before and after acid hydrolysis.