

Water

Level: CIE A Level 9700

Subject: Biology

Exam Board: Suitable for all boards

Topic: Water

Type: Mark Scheme

To be used by all students preparing for CIE Biology A Level 9700 foundation or higher tier but also suitable for students of other boards.

Mark schemes

1	<p>Low humidity results in more woodlice moving;</p> <p>So increased movement increased chance of leaving dry / unfavourable environment so reduce water loss / reduce evaporation;</p>	[2]
2	<p>(a) (i) both are polymers / polysaccharides / built up from many sugar units / both contain glycosidic bonds / contain (C)arbon, (H)ydrogen and (O)xygen;</p> <p>(ii) hemicellulose shorter / smaller than cellulose / fewer carbons; hemicellulose from pentose / five-carbon sugars and cellulose from hexose / glucose / six-carbon sugars; <i>(only credit answers which compare like with like.)</i></p> <p>(b) protein / nucleic acid / enzyme / RNA / DNA / starch / amylose / amylopectin polypeptide;</p> <p>(c) (i) to make sure that all the water has been lost;</p> <p>(ii) only water given off below 90 °C; (above 90°C) other substances straw burnt / oxidised / broken down; and lost as gas / produce loss in mass;</p> <p>(d) enzymes are specific; <u>shape</u> of lignin molecules will not <u>fit</u> active site (of enzyme); OR <u>shape</u> of active site (of enzyme); will not <u>fit</u> molecule;</p> <p>(e) 1. made from β-glucose; 2. joined by condensation / removing molecule of water / glycosidic bond; 3. 1 : 4 link specified or described; 4. "flipping over" of alternate molecules; 5. hydrogen bonds linking chains / long straight chains; 6. cellulose makes cell walls strong / cellulose fibres are strong; 7. can resist turgor pressure / osmotic pressure / pulling forces; 8. bond difficult to break; 9. resists digestion / action of microorganisms / enzymes; <i>(allow maximum of 4 marks for structural features)</i></p>	<p>1</p> <p>2</p> <p>1</p> <p>1</p> <p>2</p> <p>2 max</p> <p>6 max</p>

[15]

3

- (a) 1. Polar molecule;
2. Acts as a (universal) solvent;

OR

3. (Universal) solvent;
4. (Metabolic) reactions occur faster in solution;

OR

5. Reactive;
6. Takes place in hydrolysis / condensation / named reaction;
Polar molecule so acts as (universal) solvent so (metabolic reactions are faster = 3 marks

4

- (b) Name of ion;

Correct function within cell;

Ions other than sodium in specification are H^+ , Fe^{2+} and PO_4^{3-} but accept any correct ion (other than sodium) plus relevant function = 2.

Allow ion to be named in words but not as element, e.g, iron ion but not iron.

2

- (c) 1. Comparison: both move down concentration gradient;
2. Comparison: both move through (protein) channels in membrane;
Accept aquaporins (for water) and ion channels
3. Contrast: ions can move against a concentration gradient by active transport

3

[9]