

Water

Level: CIE AS 9700

Subject: Biology

Exam Board: Suitable for all boards

Topic: Water

Type: Mark Scheme

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

Mark schemes

- 1** Low humidity results in more woodlice moving;
So increased movement increased chance of leaving dry / unfavourable environment so reduce water loss / reduce evaporation; [2]
- 2**
- (a) (i) both are polymers / polysaccharides / built up from many sugar units / both contain glycosidic bonds / contain (C)arbon, (H)ydrogen and (O)xygen; 1
- (ii) hemicellulose shorter / smaller than cellulose / fewer carbons;
hemicellulose from pentose / five-carbon sugars and cellulose from hexose / glucose / six-carbon sugars;
(only credit answers which compare like with like.) 2
- (b) protein / nucleic acid / enzyme / RNA / DNA / starch / amylose / amylopectin polypeptide; 1
- (c) (i) to make sure that all the water has been lost; 1
- (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; 2
- (d) enzymes are specific;
shape of lignin molecules will not fit active site (of enzyme);
OR
shape of active site (of enzyme);
will not fit molecule; 2 max
- (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;
(allow maximum of 4 marks for structural features) 6 max
- [15]**



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- (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

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- (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.

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- (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

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[9]