

## Mark schemes

## Q1.

(a)

| Letter | Statement   |
|--------|---|
| B;     | is a monomer in an enzyme's active site                         |
| D;     | is a monomer in cellulose                                       |
| C;     | is produced during photosynthesis and respiration               |
| B;     | forms a polymer that gives a positive result with a biuret test |

*Must be in correct order*

4

(b) C = 18, H = 32, O = 16;

*Accept only these answers*

1

(c) 1. Heat with acid **and** neutralise;*Accept boil/water bath for heat**Accept named alkali for neutralise**Accept named examples, eg HCl, NaHCO<sub>3</sub>*

2. Heat with Benedict's (solution);

3. Red precipitate/colour;

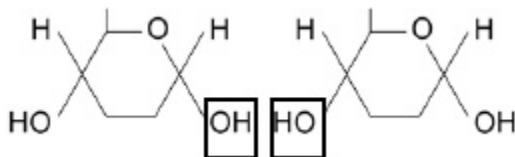
*Accept other colours eg orange/ brown/green*

3

**[8]**

## Q2.

(a)

*Accept a box drawn around any OH and H from another**OH**OR**Accept one box around two OHs*

1

(b) 1. Filter **and** dry (the precipitate);*Accept: correct reference to evaporation **after** filtration*

2. Find mass/weight; 2
- (c) 1. A = glucose **and** B = maltose;
2. Because **more** sugar/precipitate **after** hydrolysis/maltase action;  
*Accept 'higher concentration of sugar' for 'more sugar'*  
*Accept 'break down' for hydrolysis* 2
- (d) 1. Quantitative  
**OR**  
 (Colour change is) subjective;  
*Accept: accurate/precise*
2. Standardises (the) method; 1 max
- (e) 16.67 – 17 = 2 marks;  
 (cumulative percentage error of both measuring vessels)
- If incorrect final answer, accept for 1 mark:  
 0.167 – 0.17 (not a percentage)
- $$\frac{1}{15} + \frac{0.5}{5} \times 100$$
- OR**  
 evidence of  
 $\frac{1}{15} + \frac{0.5}{5}$
- (correct understanding, but not calculated)  
*Ignore: ± (plus or minus) in answer* 2
- [8]**

**Q3.**

- (a) (a monomer is a smaller / repeating) unit / molecule from which larger molecules / polymers are made;  
*Reject atoms / elements / 'building blocks' for units / molecules*  
*Ignore examples* 1
- (b) **Similarity**
1. Both contain galactose / a glycosidic bond;  
*Ignore references to hydrolysis and / or condensation*
- Difference**
2. Lactulose contains fructose, whereas lactose contains glucose;

*Ignore alpha / beta prefix for glucose  
Difference must be stated, not implied*

2

**Q4.**

- (a)
1. Cellulose is made up of  $\beta$ -glucose (monomers) **and** glycogen is made up of  $\alpha$ -glucose (monomers);
  2. Cellulose molecule has straight chain **and** glycogen is branched;
  3. Cellulose molecule has straight chain **and** glycogen is coiled;
  4. glycogen has 1,4- and 1,6- glycosidic bonds **and** cellulose has only 1,4- glycosidic bonds;

*Ignore ref. to H bonds / microfibrils*

2 max

- (b) Any **two** from:

1. Insoluble (in water), so doesn't affect water potential;
2. Branched / coiled / ( $\alpha$ -)helix, so makes molecule compact;  
**OR**  
Branched / coiled / ( $\alpha$ -)helix so can fit many (molecules) in small area;
3. Polymer of ( $\alpha$ -)glucose so provides glucose for respiration;
4. Branched / more ends for fast breakdown / enzyme action;
5. Large (molecule), so can't cross the cell membrane

*Require feature **and** explanation for 1 mark*

1. *Accept  $\Psi$  or WP*
1. *Accept Insoluble so doesn't affect osmosis*
1. *Do **not** allow ref to 'doesn't affect water leaving cells'*
4. *Ignore 'surface area'*
4. *Accept 'branched so glucose readily released'*

2 max

- (c) Iodine/potassium iodide;

1

**Q5.**

- (a)
1. Polysaccharide of  $\alpha$ -glucose;  
**OR**  
polymer of  $\alpha$ -glucose;
  2. (Joined by) glycosidic bonds  
**OR**  
Branched structure;

2

- (b)
1. Hydrolysed (to glucose);
  2. Glucose used in respiration;
    1. *Ignore 'Broken down'*
    2. *'Energy produced' disqualifies mp2*

2

**Q6.**

- (a) Glucose (and glucose); 1
- (b) ( $\alpha$ 1,4) Glycosidic; 1
- (c) 1. Headings correct – mol dm<sup>-3</sup> **and** volume of water / cm<sup>3</sup>;  
2. Concentration correct. ie 0.2; 2
- (d) Line of best fit drawn;  
Read off value at 0.45. 2
- [6]**

**Q7.**

- (a) 1. Starch formed from  $\alpha$ -glucose but cellulose formed from  $\beta$ -glucose;  
2. Position of hydrogen and hydroxyl groups on carbon atom 1 inverted. 2
- (b) 1. Insoluble;  
2. Don't affect water potential;  
**OR**  
3. Helical;  
*Accept form spirals*  
4. Compact;
- OR**  
5. Large molecule;  
6. Cannot leave cell. 2
- (c) 1. Long and straight chains;  
2. Become linked together by many hydrogen bonds to form fibrils;  
3. Provide strength (to cell wall). 3
- [7]**