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, $NaHCO_3$

2. Heat with Benedict's (solution);

3. Red precipitate/colour;

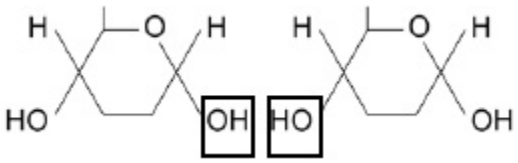
Accept other colours eg orange/ brown/green

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 β-glucose (monomers) **and** glycogen is made up of α-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 / (α-)helix, so makes molecule compact;
   OR
   Branched / coiled / (α-)helix so can fit many (molecules) in small area;
3. Polymer of (α-)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 Ψ 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 α-glucose;
   OR
   polymer of α-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) (α1,4) Glycosidic;

1

(c) 1. Headings correct – mol dm^{-3} **and** volume of water / cm^3;

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 α-glucose but cellulose formed from β-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]