Mark schemes

Q1.

(a) 2;

*Accept glucose **and** fructose*

1

(b) 1. **Heat** with Benedict's (solution/reagent);

Ignore water bath unqualified

Ignore warm

Accept Fehling's for Benedict's

Reject if heat with acid

2. Red (colour/precipitate);

*Accept green **OR** orange **OR** brown **OR** yellow*

Ignore emulsion

3. (Because) glucose/fructose is/are reducing sugars

OR

(Because) glucose/fructose is/are detected;

Reject if sucrose is detected

3

(c) 1.6 / 1.62;

Accept 2

1

(d) 1. Molasses/solution has a lower water potential

OR

Water (in beaker) has higher water potential;

*Accept more negative for lower **OR** less negative for higher*

Accept Ψ for water potential

2. Water moves in (across) partially/selectively permeable <u>bladder</u>;

Accept semi-permeable

3. Increased (molasses/solution) <u>volume</u>

OR

Decreased air <u>volume</u>;

3

(e) Suggested change

1. Diluted (molasses)

OR

Decreased (molasses) concentration

OR

Increased (molasses) water potential

OR

Decreased water potential gradient;

Ignore reduced temperature
Accept less negative for increased
Accept Ψ for water potential

2. (Reduction by) 80% / 5 times

OR

(Reduction to) 20%

OR

(Used) 1 in 5 molasses to water

OR

(Used) 1 : 4 molasses to water;

Accept description of 1 : 4 ratio, eg 20 (cm^3) molasses (added) to 80 (cm^3) water
OR
*Accept fivefold **OR** factor of 5 for 5 times dilution*

2

[10]

Q2.

(a) 1. (Alternate) monomers/glucoses are flipped/upside down/rotated (by 180°);

2. (Joined by) glycosidic bonds;

3. (Forms) straight/linear/unbranched (chains/ molecules);

Ignore they are both polysaccharides

Accept as an additional mark point, 'contains 1-4 linkages/bonds'

Reject if reference made to 1-6

Accept as an additional mark point, 'have β glucose'

Ignore both contain C, H and O

3 max

(b) **EITHER**

1. Tracheole (wall) thin/one cell thick;

2. (So) rapid diffusion (into cells)

OR

(So) short diffusion pathway/distance;

OR

3. Tracheoles enter/supply tissues/muscle fibres;

Accept touch OR push OR 'close to' for enter

Accept cells for tissues

4. (So) diffusion direct into cells

OR

(So) short diffusion pathway/distance

OR

(So) rapid diffusion (into cells);

OR

5. Tracheoles are highly branched;

Accept 'large number' OR 'many' for highly branched

6. (So) short diffusion distance/pathway

OR

(So) large surface area for (rapid) diffusion;

Ignore SA
Ignore 'to volume ratio' OR ':vol'
***Mark as pairs**, 1 and 2 OR 3 and 4 OR 5 and 6*
Ignore 'liquid in tracheoles'

2 max

(c) 1. (Allows unbroken) water column

OR

(So) no barrier to (water) movement;

Accept idea of continuous flow OR stream of water
Ignore chain of water molecules

2. Cohesion from H bonds between (all) water (molecules)

OR

Cohesion from (polar) attraction between (all) water (molecules);

3. Evaporation/transpiration creates tension (in column)

OR

Water moves from xylem (into cells) creates tension

OR

(To) pull up water creates tension (in xylem);

If 1, 2 or 3 are not awarded accept a principle mark for correct reference to <u>cohesion-tension</u> causing water movement

3

[8]

Q3.

(a) Isomer(ism);

Accept phonetic spelling

Ignore structural

1

(b) High(er) absorbance (has more sugar)

OR

Low(er) transmission (has more sugar);

Accept a description of absorbance or transmission

1

(c) 1. Benedict's (solution) volume;

2. Benedict's (solution) concentration;

3. (Fruit) juice volume;

4. (Water bath/water/solution) temperature;

5. Duration of heating (in water bath);

Accept examples of volumes and concentrations and temperatures

2 max

(d) Correct answer for 2 marks = 12;;

Accept for 1 mark,

30 (correct mass of apple core)

OR

150 (correct mass of apple flesh)

OR

$0.08 / \frac{8}{100}$ × incorrect mass **calculated** using the ratio

OR

14.4 (correct mass in whole apple)

2

(e) 1. Starch hydrolysed;

2. Maltose is soluble (so reduces Ψ)

OR

Starch is insoluble;

Accept glucose for maltose
Ignore sugar

2

[8]

Q4.

(a) 1. Sucrose actively transported into phloem (cell);
OR
Sucrose is co-transported/moved with H^+ into phloem (cell);
Accept sieve (element/tube/cell) for phloem (cell)

2. (By) companion/transfer cells;

3. Lowers water potential (in phloem) **and** water enters (from xylem) by osmosis;

4. (Produces) high(er) (hydrostatic) pressure;
OR
(Produces hydrostatic) pressure gradient;
Accept description of gradient, eg higher WP

5. Mass flow **to** respiring cells
OR
Mass flow to storage tissue/organ;
Accept transport OR movement for flow
Accept buds/young leaves/fruit/seeds/shoot tip/root tip/ meristems/root

6. Unloaded/removed (from phloem) by active transport;
Accept facilitated diffusion

5 max

(b) 1. Both polysaccharides;
OR
Both are glucose polymers
OR
Both are made of glucose monomers;

2. Both contain glycosidic bonds (between monomers);

3. Both contain carbon, hydrogen and oxygen/C, H and O;

4. Starch made of α-glucose **and** cellulose made of β-glucose;

5. Starch (molecule) is helical/coiled **and** cellulose (molecule) is straight;

6. Starch (molecule) is branched **and** cellulose is not/unbranched;

7. Cellulose has (micro/macro) fibrils **and** starch does not;

Must include 1, 2 OR 3 to achieve 6 marks

All statements must be clearly comparative or linked by the candidate, not inferred from separate statements

Additional mark point

*Starch has 1−6 glycosidic bonds **and** cellulose does not*

OR

*Starch contains two types of molecule **and** cellulose contains one type of molecule*

OR

*Starch is amylose and amylopectin **and** cellulose is one type of molecule;*

6 max

(c) 1. Hydrolysis;

2. (Of) glycosidic bonds;

3. (Starch) to maltose by amylase;

4. (Maltose) to glucose by disaccharidase/maltase;

5. Membrane-bound (disaccharidase/maltase);

Other than 5., do not penalise incorrect site for digestion or incorrect site of enzyme production

Accept microvilli for membrane

4 max

[15]