

AS Level Biology B

H022/02 Biology in depth

Question Set 13

1 The structure of the monosaccharide fructose is shown below in Fig. 1.1.

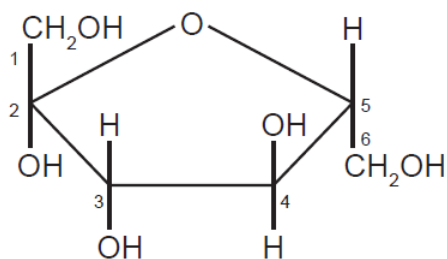


Fig. 1.1

(a) (i) Using Fig. 1.1, describe one **visible similarity** between fructose and α -glucose. [1]

(ii) Using Fig. 1.1, describe one **visible difference** between fructose and α -glucose. [1]

(b) Fructose and α -glucose can be joined together to make sucrose.

Sucrose produced in the leaves of a potato plant can be transported to the roots where it is converted into starch and stored.

Fig. 1.2 shows a leaf of a sweet potato plant in transverse section.

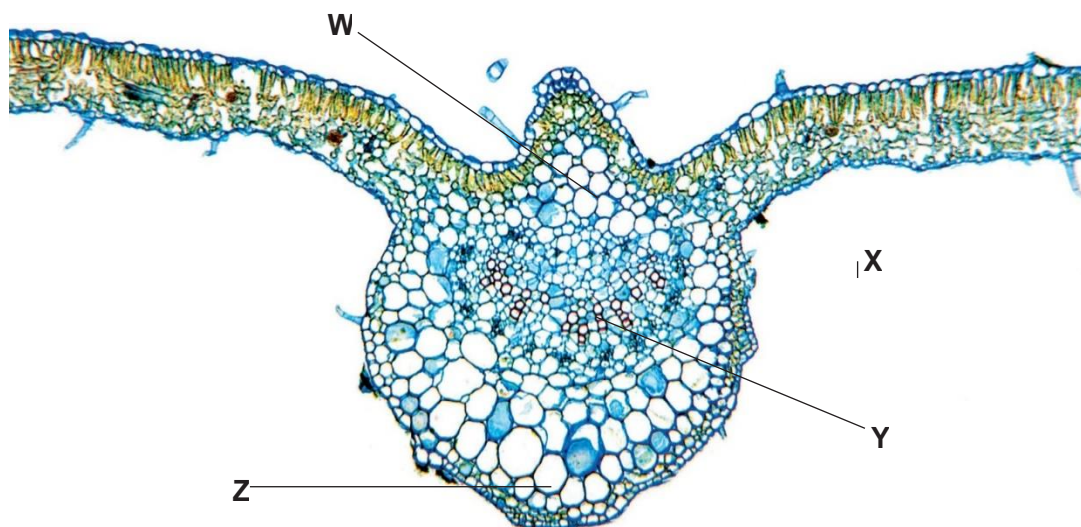


Fig. 1.2

(i) Through which of the tissues, labelled **W** to **Z** in Fig. 1.2, is sucrose transported? [1]

(ii) The plant tissues in Fig. 1.2 have been stained.

State the type of stain and explain why it was used to prepare the slide. [2]

(c) Starch can be hydrolysed using hydrochloric acid. A student was investigating the hydrolysis of potato starch.

Fig. 1.3 shows the procedure used.

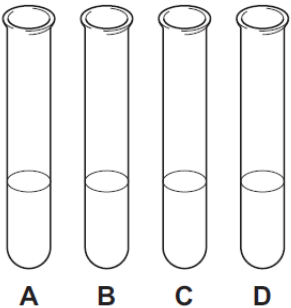
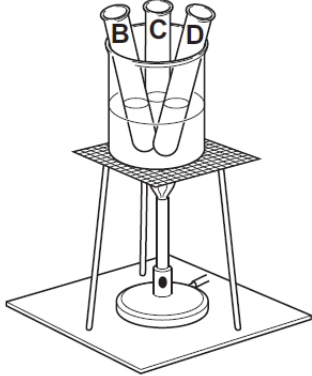
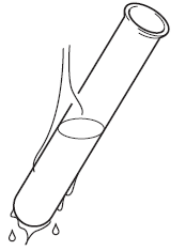
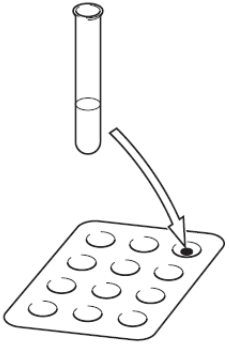
	<p>Dilute hydrochloric acid was added to a sample of ground-up potato in each of four test tubes. These test tubes were labelled A, B, C and D.</p>
	<p>Test tubes B, C and D were placed into a boiling water bath.</p> <p>Test tube A moved directly to the next stage in the procedure.</p>
	<p>Sodium hydrogencarbonate was immediately added to test tube A.</p> <p>Test tube B was cooled at five minutes, C at ten minutes and D at fifteen minutes. Sodium hydrogencarbonate was added to each test tube.</p>
	<p>A small sample was removed from each test tube, and iodine solution was added.</p>

Fig. 1.3

The results are shown in the table below.

Test tube	Time in boiling water (min)	Observation with iodine solution
A	0	dark blue/black
B	5	dark blue
C	10	dark brown
D	15	

- (i) Suggest the expected observation for test tube **D** and give a reason for your answer. [1]
- (ii) Suggest why sodium hydrogencarbonate was added to all four test tubes. [1]
- (iii) The student proposed that:
Dilute hydrochloric acid played a significant part in the hydrolysis of potato starch.
Describe a suitable control that the student could have carried out to test this hypothesis. [2]
- (iv) The students found it difficult to compare each other's observations on the colour changes.
What method could they have used to obtain quantitative results? [1]

Total Marks for Question Set 13: 10

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