

AS Level Biology B

H022/02 Biology in depth

Question Set 11

- 1 Glucose is produced by plants during photosynthesis. It can be combined with fructose to form the disaccharide sucrose, which can then be transported to other tissues inside the plant.

Fig. 1 is a diagram of glucose and fructose.

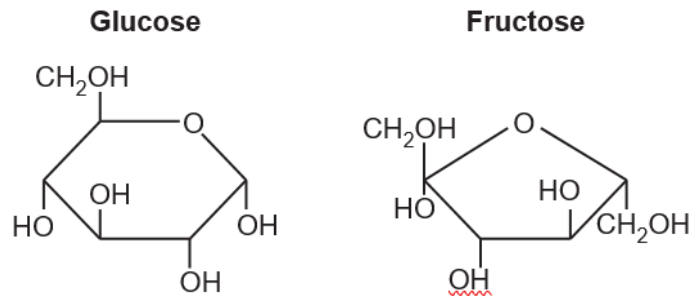


Fig. 1

- (a) Using the information in Fig. 5, draw a diagram of a sucrose molecule in the space below.

[2]

(b) A student used the following procedure to test different organs from a tomato plant for the presence of sucrose.

1. Remove a leaf from the tomato plant and after dipping it into boiling water grind it using a mortar and pestle.
2. Add water to the ground up leaf and filter the mixture.
3. Pour a small sample of the filtrate into a test tube and add dilute hydrochloric acid.
4. Place the test tube into a water bath.
5. Remove the test tube from the water bath and add sodium hydrogen carbonate.
6. Add Benedict's reagent and then place the test tube back into the water bath.
7. Record the colour of the contents of the test tube.
8. Repeat steps 1 to 7 with stem and root samples taken from the same tomato plant.

Table 1 shows the observations recorded by the student.

Plant organ being tested	Observations
Leaf	Blue-green
Stem	Green-orange
Root	Blue-green

Table 1

(i) The student made the following statement:

My observations support the theory of translocation.

Using the information in Table 1 and your knowledge of translocation discuss the validity of this statement.

[4]

(ii) State **three** modifications to the procedure that would allow the observations in Table 1 to be reproducible.

- 1
- 2
- 3

[3]

(c) Tomato plants are broad-leaved crop plants.

Compare the structure of a tomato plant with that of a cereal crop plant, such as wheat with regards to their transport systems.

[3]

(d) The presence of starch in seeds can be detected using iodine-KI reagent.

When tested with iodine-KI reagent, dry seeds showed a high concentration of starch but after the seeds had been soaked in water for seven days they tested negative for the presence of starch.

Explain why the seeds tested negative for starch after being soaked in water.

[3]

Total Marks for Question Set 11: 15



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