

**AS Level Biology A**  
**H020/01 Breadth in Biology**

**Question Set 16**

1. A student investigated the effects of different solutions on pieces of potato tissue. Six potato rods were prepared with a cork borer. The student trimmed them to a length of exactly 5 cm.

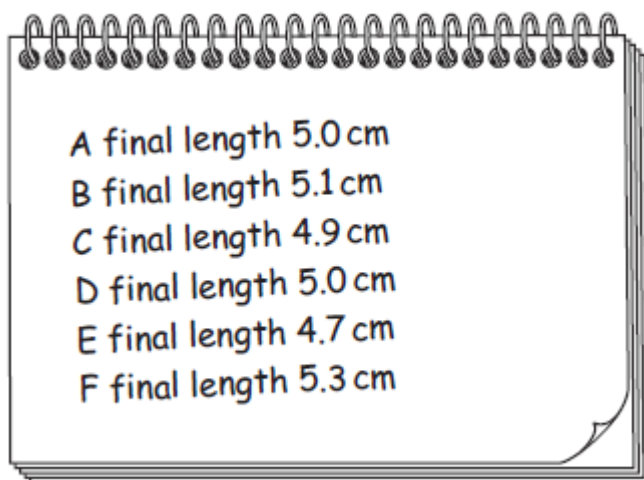
After treatment, the six rods were placed in test tubes and submerged in either sucrose solution or distilled water.

The treatment and liquid added to each potato rod is shown in Table 21 below.

| Potato rod | Treatment                       | Liquid added                            |
|------------|---------------------------------|---|
| A          | boiled in water for 5 minutes   | 1 mol dm <sup>-3</sup> sucrose solution |
| B          | boiled in water for 5 minutes   | distilled water                         |
| C          | soaked in ethanol for 5 minutes | 1 mol dm <sup>-3</sup> sucrose solution |
| D          | soaked in ethanol for 5 minutes | distilled water                         |
| E          | untreated                       | 1 mol dm <sup>-3</sup> sucrose solution |
| F          | untreated                       | distilled water                         |

**Table 21**

After 30 minutes, the rods were removed from the tubes and their lengths measured. The student recorded the results on a piece of scrap paper, shown below.



- (a) In the space below, present the student's results in an appropriate format.

**(b) (i)** Explain how the treatment results in the difference in the final lengths of rod **A** and rod **E**.

..... [2]

**(ii)** Explain how the treatment results in the difference in the final lengths of rod **D** and rod **F**.

..... [2]

**(c)** State how the student could reduce the uncertainty of their data.

..... [1]

**Total Marks for Question Set 16: 8**

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