

A Level Biology A
H420/01 Biological Processes

Question Set 12

12 (a)

A student carried out an investigation into the effect of ethanol on the permeability of cell membranes in beetroot.

The student's method comprised the following five steps:

1. Cut equal sized pieces of beetroot using a cork borer.
2. Wash the pieces in running water.
3. Place the pieces in 100cm³ of different concentrations of ethanol.
4. After 5 minutes, remove samples from each of the ethanol solutions.
5. Place each of the samples into a colorimeter to collect quantitative data.

(i) Each step in the student's method relies on certain assumptions.

For each assumption listed below, select the **numbered step** from the student's method that relies upon that assumption.

Assumption A
Pigment will only leak into the solution if membranes are disrupted.

Assumption A relates to step
.....

Assumption B
Absorbance is proportional to concentration of pigment.

Assumption B relates to step

Assumption C
Pigment will be released when the beetroot is sliced.

Assumption C relates to step

[3]

(ii) The student kept the ethanol solutions at a constant temperature. State **two other** variables which need to be controlled in this investigation to ensure the data collected are valid.

1

2

[2]

(b) (i) Fig. 20.1 shows the graph plotted by the student.

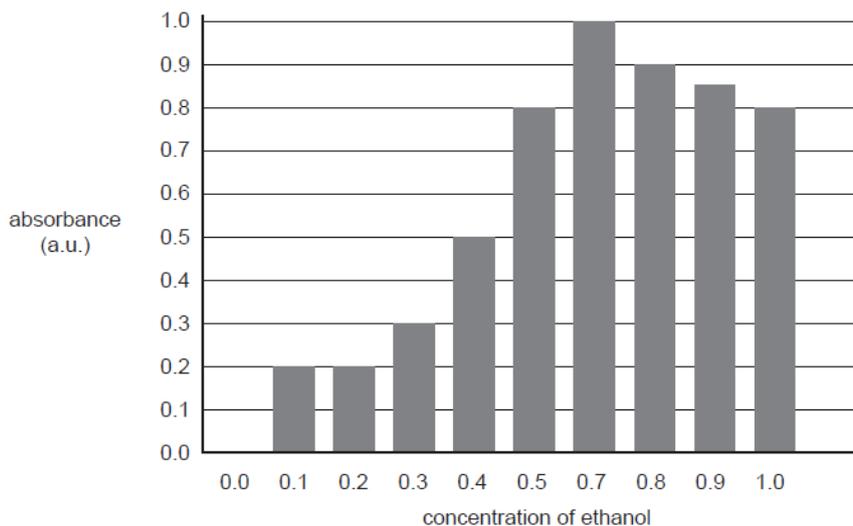


Fig. 20.1

Make **three** criticisms of the way the student has displayed these results.

- 1
- 2
- 3

[3]

(b) (ii) Explain how carrying out replicates would improve this investigation.

[2]

Total Marks for Question Set 12: 10

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