Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

BIOLOGY **9700/05**

Paper 5 Planning, Analysis and Evaluation

For Examination from 2007

Specimen Paper

Candidates answer on the Question Paper.
No Additional Materials are required.

1 hour 15 minutes

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

UNIVERSITY *of* CAMBRIDGE
International Examinations

[Turn over

1 **(a)** The rate of respiration in two tissues, **A** and **B** was measured using DCPIP as an indicator. 50 g of each tissue was ground into paste using 10 cm^3 of ice cold buffer and made into a suspension with 250 cm^3 of buffer solution. The two suspensions were placed into a water bath at 20 ^{o}C.

Two sets of ten tubes, each containing 10 cm^3 of buffer and 1 cm^3 of DCPIP, were placed into separate water baths at 20 ^{o}C and left for 10 minutes.

To one set of ten tubes, 0.5 cm^3 of suspension **A** was added. To the other set of ten tubes, 0.5 cm^3 of suspension B was added. The time taken for DCPIP to become colourless was measured separately in each tube.

(i) State the dependent and independent variable in this investigation.

independent variable ....

dependent variable .... [1]

(ii) Identify the key variables that have been controlled in this investigation.

For each variable, describe how it has been controlled.

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.... [3]

(iii) Suggest how the colourless end point of the DCPIP might have been standardised.

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.... [1]

(b) The results of this investigation are shown in Table 1.1.

Table 1.1

time taken for DCPIP to become colourless/s									
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Tissue A 55	56	59	54	52	56	55	55	59	59
Tissue B 125	126	122	126	122	119	121	123	124	125

(i) Use the formulae below to calculate the standard error for each of the tissues tested.

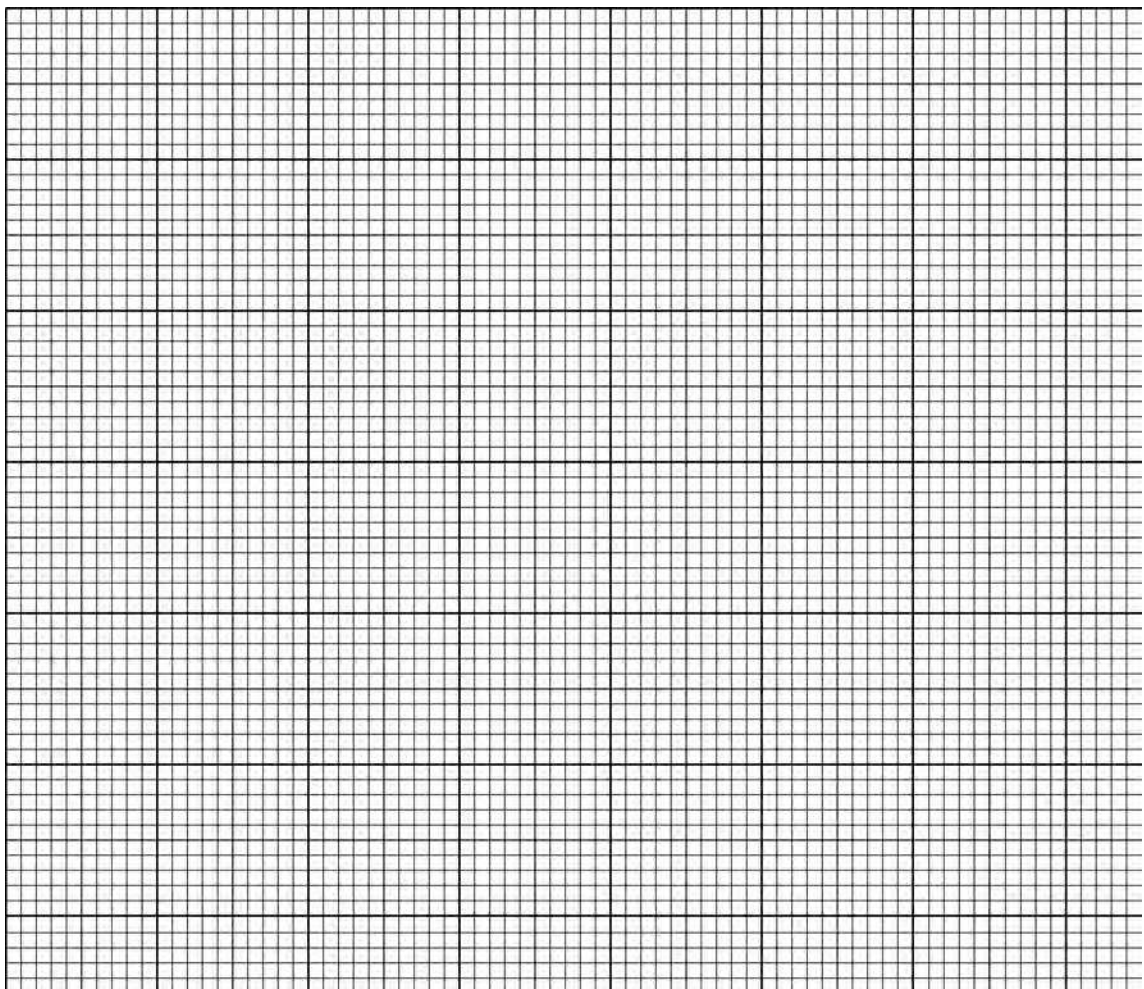Standard deviation (s)   Standard error S_M

$$s = \sqrt{\frac{\Sigma(x - \bar{x})^2}{n - 1}}$$ $$S_M = \frac{S}{\sqrt{n}}$$

Standard error for sample **A**   ....

Standard error for sample **B**   ....   [4]

(ii) Use the grid to plot a bar chart of the mean results and standard error for this
investigation.

[3]

(iii) What do the values for standard error indicate about the accuracy of the results of
this investigation?

....

....   [1]

[Total 13]

2 Fig. 2.1 shows the structure of a root tip.

specialised cells

elongating cells
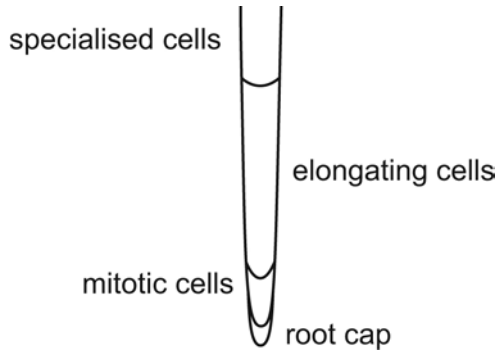
mitotic cells

root cap

Fig. 2.1

Radicles of seedlings constantly produce new cells by mitosis. As these cells develop they become elongated by absorbing water and the vacuole expanding and causing the cell wall to stretch. Growth regulators control the plasticity of the cell wall so it is able to stretch.

The developing radicles of seedlings placed horizontally respond by curving and growing in the direction of gravity.

One hypothesis to explain this curvature is that the root cap contains gravity receptors that causes changes in the distribution of auxin secreted by the root tip.

Describe how this hypothesis could be tested.

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.... [10]

3 Fig. 3.1 shows genetic fingerprints made from DNA samples of a number of different mammals.

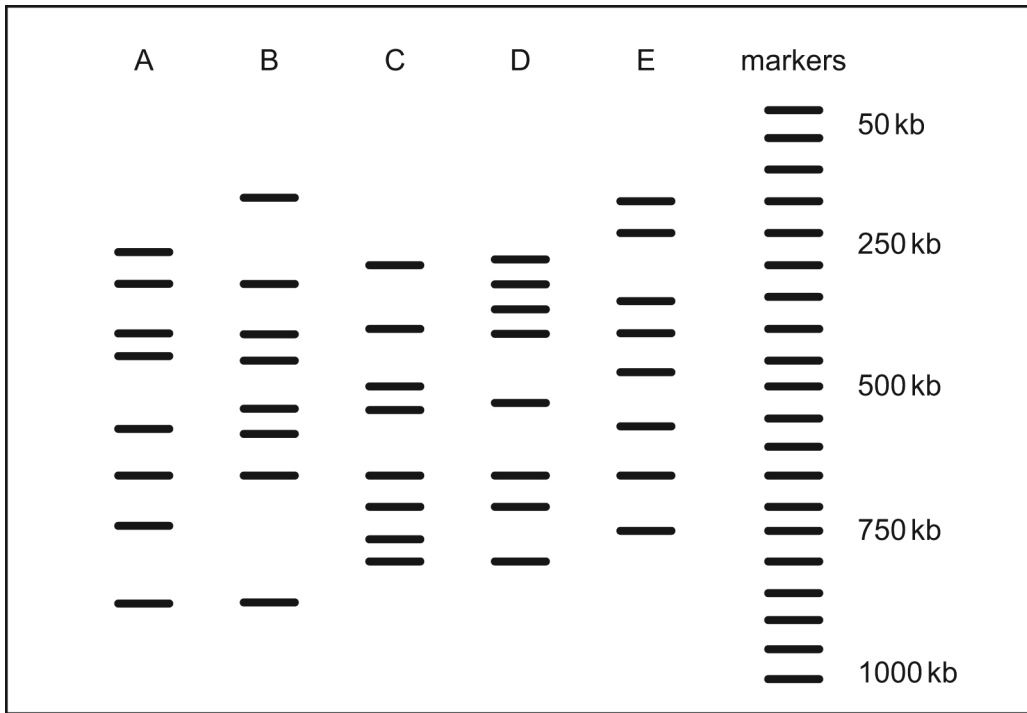**Fig. 3.1**

(a) Explain how the genetic finger print provides evidence that these mammals share a common ancestor.

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.... [2]

(b) Use the information in the diagram to explain the evolutionary relationship between these mammals.

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.... [5]

[Total 7]

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