Centre No.						Paper Reference (complete below)							Surname	Initial(s)
Candidate No.										/			Signature	

Paper Reference(s)

4325/03 4437/07

Examiner's use only

Team Leader's use only

London Examinations IGCSE

Biology – 4325

Paper 3

Science (Double Award) – 4437

Paper 7

Foundation and Higher Tiers

Tuesday 13 May 2008 – Morning

Time: 1 hour 15 minutes

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
Total	

Materials required for examination
Ruler, pencil and eraser

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s), the paper reference and your signature.
The paper references are shown above. Write the one for which you have been entered. Check that you have the correct question paper.
Answer **ALL** the questions in the spaces provided in this question paper.
Show all the steps in any calculations and state the units.
Calculators may be used.

Information for Candidates

The total mark for this paper is 50. The marks for parts of questions are shown in round brackets: e.g. **(2)**.
There are 12 pages in this question paper. All blank pages are indicated.

Advice to Candidates

Write your answers neatly and in good English.

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Turn over

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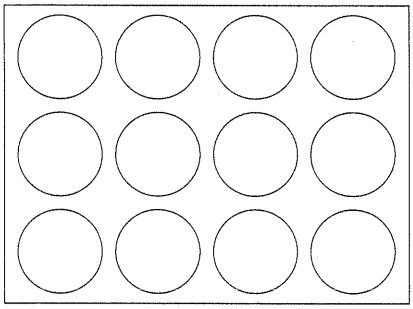
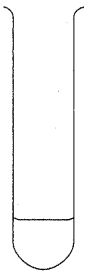
Leave blank

Answer ALL the questions. Write your answers in the spaces provided.

1. The diagram shows items that can be used in food tests.



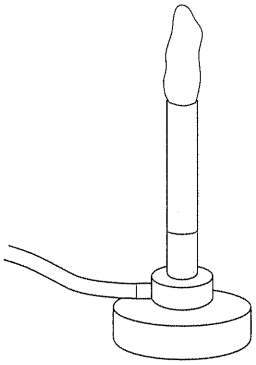
Spotting tile



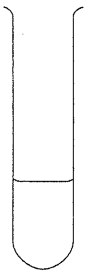
Benedict's solution

Biuret solution

Water



Bunsen burner



Ethanol

Select appropriate items to use in each food test and write your answers in the table below.

Test for	Items used
Glucose	and
Starch	and

Q1

(Total 4 marks)

Leave blank

2. The data below show the effect of temperature on the time taken for an enzyme to digest all of the protein present in a sample tube.

Temperature in °C	Average time taken to digest the protein in minutes
5	10
10	6
15	4
20	3
25	2
30	1
60	7
75	not digested after 30 minutes

(a) Describe the effect of temperature on the speed of digestion of the protein.

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(2)

(b) Use your scientific knowledge to explain the effect of temperature on this enzyme-controlled reaction.

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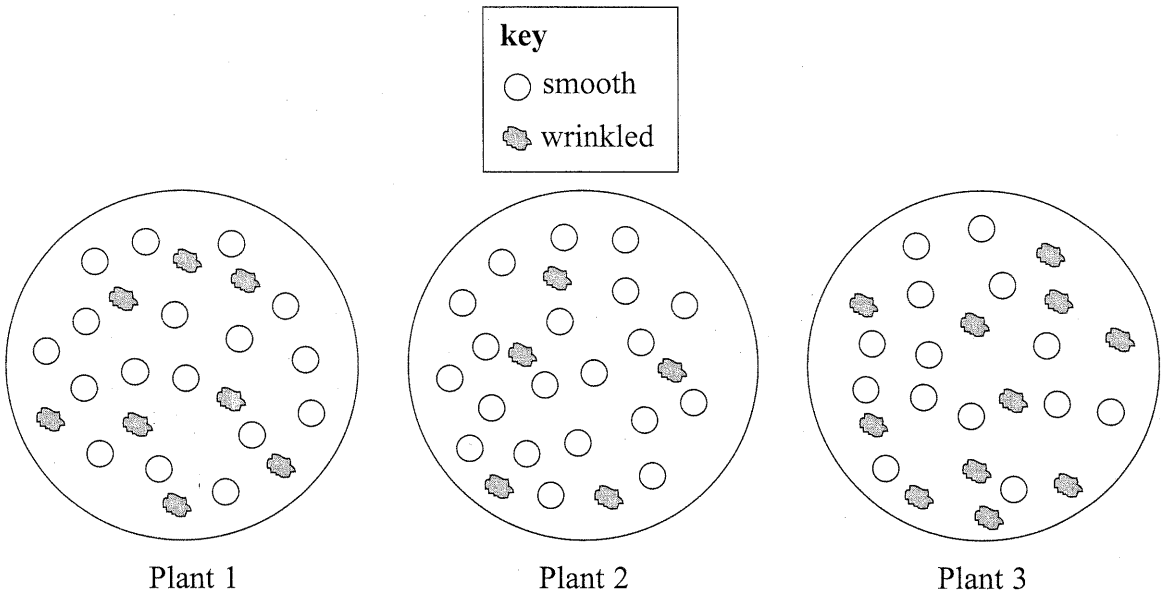
(3) **Q2**

(Total 5 marks)

Leave blank

3. A gardener collected 25 seeds from each of three pea plants that he had grown. He noticed that the pea seeds were either smooth or wrinkled. These are shown in the diagram below.



(a) He counted the number of smooth and wrinkled seeds from each plant and recorded the results for plants 1 and 2 in a table.

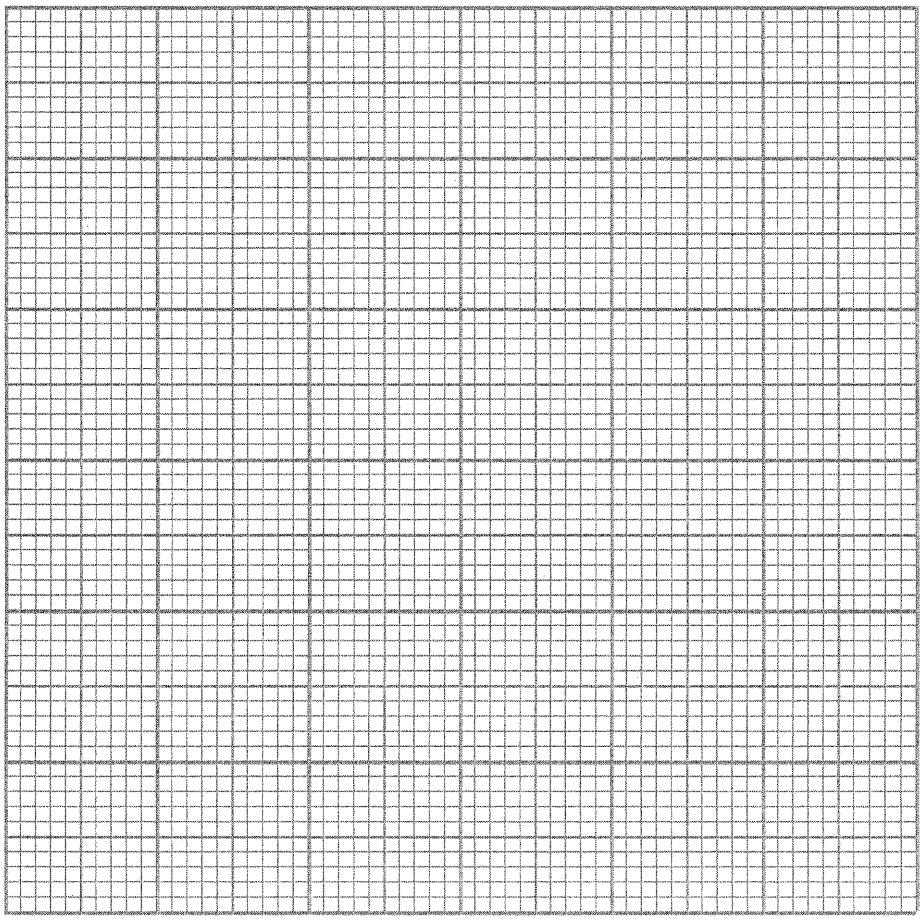
(i) Complete the table by counting the seeds from plant 3.

Plant	Number of seeds	
	Smooth	Wrinkled
1	17	8
2	20	5
3		

(2)

Leave blank

(ii) Use your results to draw a bar chart to show the number of each type of seeds produced by each pea plant.



(5)

(b) The gardener thought that the appearance of the seeds was controlled by a gene. Two plants grown from smooth seeds were crossed and produced some seeds that were smooth and some seeds that were wrinkled. Explain how this could happen.

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(3)

Q3

(Total 10 marks)

Leave blank

4. A group of students wanted to investigate the effect of placing potato tissue into different concentrations of sodium chloride solution.

They used a special tool called a cork borer to cut cylinders of potato tissue out of a potato. They cut 12 cylinders of potato tissue each with the same diameter. They then carefully cut the cylinders so that they were all 10 cm in length.

The students placed the potato cylinders in four different concentrations of sodium chloride solution for one hour. They took them out of the solutions and measured their lengths again. They recorded their results in a table.

(a) (i) Describe a method you could use to ensure that the cylinders were all cut to the same length.

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(2)

(ii) Name **one** key factor (variable) that the students would need to control in this experiment and suggest how this control could be achieved.

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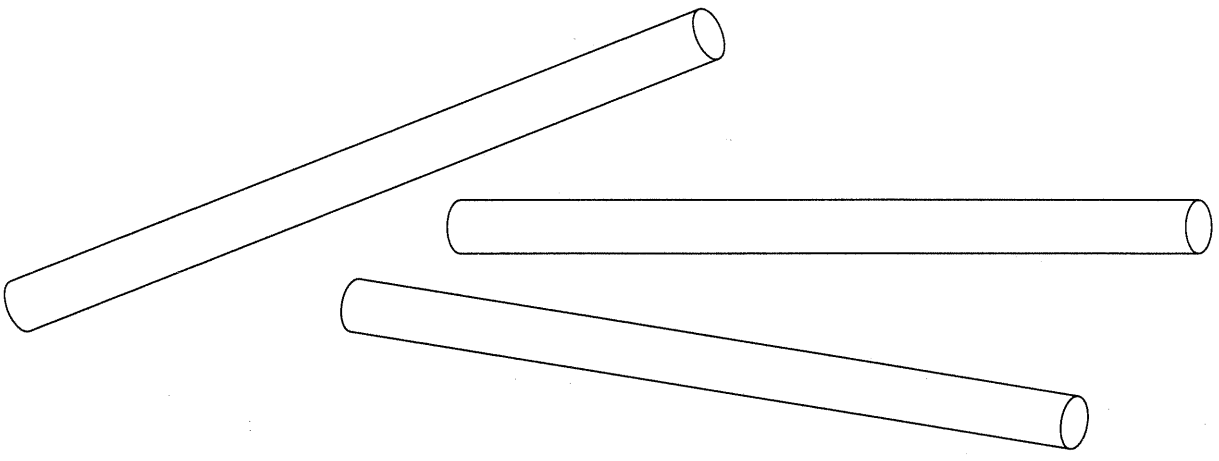
(2)

(b) (i) The cylinders shown below had been placed in 20% sodium chloride solution.

Measure the length of these three cylinders and write your measurements in the results table.



(2)

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Concentration of sodium chloride solution (%)	Length of potato cylinders in cm		
	Original length	Final length	Change in length
1	10.0	10.2	+0.2
1	10.0	10.1	+0.1
1	10.0	10.1	+0.1
5	10.0	9.9	–0.1
5	10.0	10.0	0.0
5	10.0	10.1	+0.1
15	10.0	9.8	–0.2
15	10.0	9.8	–0.2
15	10.0	9.7	–0.3
20	10.0		
20	10.0		
20	10.0		

(ii) Calculate the change in length for each of the three cylinders you have measured and write your answers in the table.

(1)

(iii) Give an explanation for the change in length of the potato cylinders placed in the 15% sodium chloride solution.

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(3)

Leave blank

(c) Use your scientific knowledge to predict and explain the change in length of the potato cylinders if they had been placed into distilled water.

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(2)

(d) (i) Suggest **one** way that the method used could be modified to improve the reliability of the investigation.

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(1)

(ii) Suggest **one** way that the method used could be modified to improve the accuracy of the investigation.

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(1)

Q4

(Total 14 marks)

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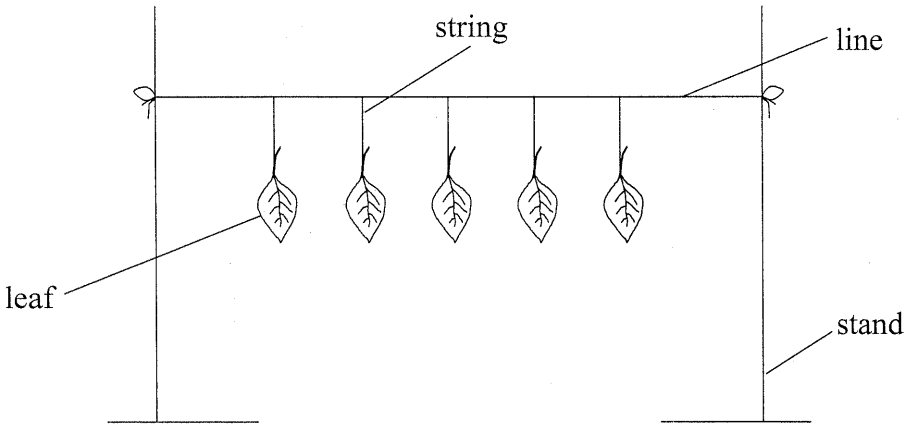
5. For his IGCSE coursework, Kieran wanted to look at the effect of different conditions on the rate of water loss from leaves.

He decided to measure the change in mass of the leaves after three hours in a warm laboratory.

He took five leaves of about the same size. He measured the mass of each leaf and attached them to a line hung between two stands, as shown in the diagram.



When he measured their masses again after three hours, he discovered that all of the leaves had lost mass. He repeated his experiment with five different leaves but this time he turned off heaters to reduce the temperature in the room.

(a) What apparatus would Kieran use to measure the mass of the leaves?

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(1)

(b) Why did Kieran use five leaves rather than just one?

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(1)

Leave blank

(c) Give **two** key factors (variables) that Kieran should have controlled in his experiment. For **each** factor that you give, suggest how that factor could be controlled.

Factor 1 .....

How controlled .....

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Factor 2 .....

How controlled .....

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(4)

(d) Predict what would happen to the change in the mass of the leaves when the temperature in the laboratory was reduced. Give a reason for your answer.

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(2)

(e) Kieran's teacher suggested that there might be a difference between the loss of water from the upper and from the lower surfaces of leaves. Describe how Kieran could modify his experiment to find out if there is a difference.

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(3)

Q5

(Total 11 marks)

Leave blank

6. Describe an investigation you could carry out to find the effect of different air temperatures on the rate of sweating in humans.

Include full experimental details in your account.

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Q6

(Total 6 marks)

TOTAL FOR PAPER: 50 MARKS

END