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

Friday 14 November 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. Write your answers 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 marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 6 questions in this question paper. The total mark for this paper is 50.
There are 16 pages in this question paper. Any 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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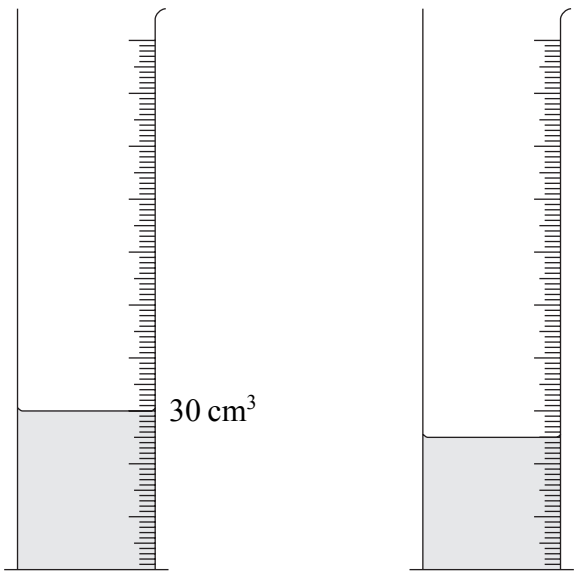
Leave blank

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

1. The diagram shows a piece of apparatus with two different readings.



(a) (i) Name the piece of apparatus shown in the diagram.

.....

(1)

(ii) What does it measure?

.....

(1)

(b) (i) Write down the reading shown in **B**.

.....

(1)

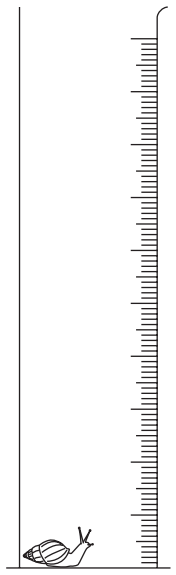
(ii) What is the difference between the readings shown in **A** and in **B**?

.....

(1)

Leave blank

(c) A water snail has a volume of 4 cm^3. A student placed the snail into the water in **A**. Draw a line on the diagram below to show the new water level.



(1)

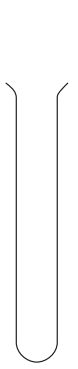
Q1

(Total 5 marks)

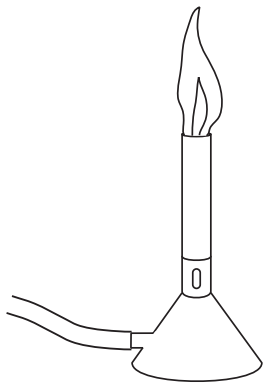
Leave blank

2. (a) (i) A student wanted to test some food samples for glucose.

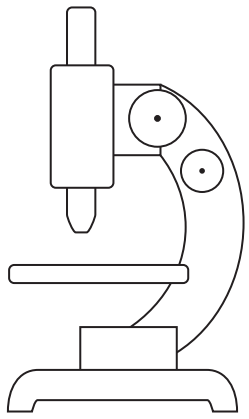
The diagrams show some apparatus.



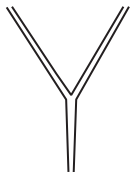
test tube



Bunsen



microscope



funnel

Choose **two** pieces of apparatus the student should use.

1 .....

2 .....

(2)

(ii) Name the reagent the student could use to test for glucose.

.....

(1)

(iii) Complete the table below to show the colour of this reagent at the start and at the end of the test. The food sample contained glucose.

Colour of reagent	
at the start of the test	**at the end of the test**

(2)

Leave blank

(b) The student decided to test for another food sample, this time to see if it contains starch.

(i) Name the reagent the student should use.

.....

(1)

(ii) What result would the student expect to see if starch was present?

.....

(1)

(iii) What result would the student expect to see if starch was not present?

.....

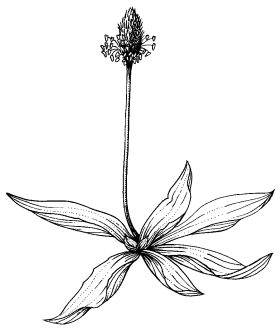
(1)

Q2

(Total 8 marks)

3. A group of students wanted to compare the population size of two different species of plant in two fields, X and Y.

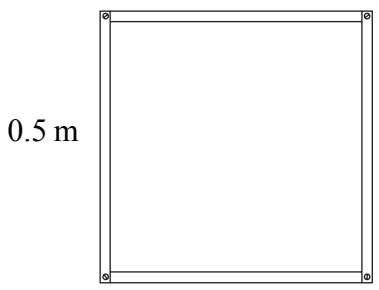
The plant species were plantains and buttercups.



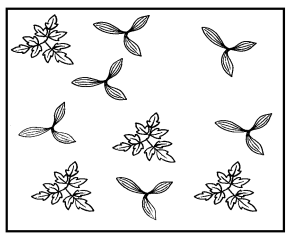
Plantain

Buttercup

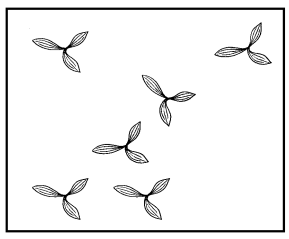
To estimate the population size in each field, they decided to use quadrats to sample the area. They used quadrats that were 0.5 m by 0.5 m as shown in the diagram below.



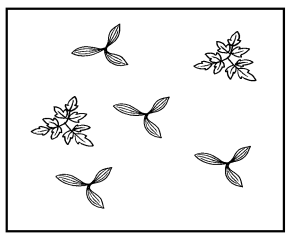
In each quadrat they counted the number of plantain plants and the number of buttercup plants. They did this in six different places in each field and called the quadrats A, B, C, D, E and F. The results of what they saw in each quadrat in field Y are shown in the drawings below.



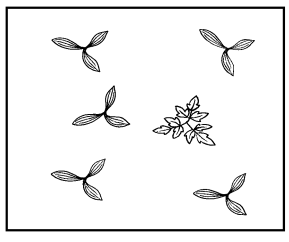
A



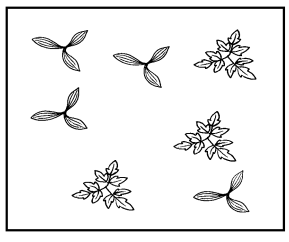
B



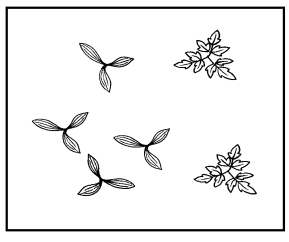
C



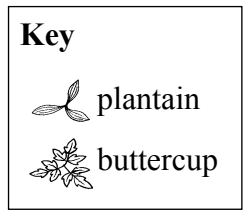
D



E



F



Leave blank

(a) The students put their results into the table below. All results for field X are already in the table.

Quadrat	Field X		Field Y	
	Plantain	Buttercup	Plantain	Buttercup
A	4	12	6	4
B	5	4		
C	6	14		
D	5	13		
E	6	12		
F	3	11		
Total	29	66		

(i) Use the drawings to complete the results in the table for field Y.
Quadrat A has been done for you.

(2)

(ii) Identify **one** result in the completed table that is most unexpected and put a ring around it.

(1)

(b) (i) Give **one** conclusion about the population size of plantains in the two fields.

.....

.....

(1)

(ii) Give **one** conclusion about the population size of buttercups in the two fields.

.....

.....

(1)

Leave blank

(c) The area sampled by one quadrat was 0.25 m^2.

(i) What was the total area sampled by six quadrats?

Answer .....

(1)

(ii) Field X has an area of 150 m^2. The total number of buttercups counted in field X was 66.

Calculate the estimated population size of buttercups for field X.

Show your working.

Answer .....

(2)

(d) Suggest how the students could make their results more reliable.

.....

.....

(1) **Q3**

(Total 9 marks)

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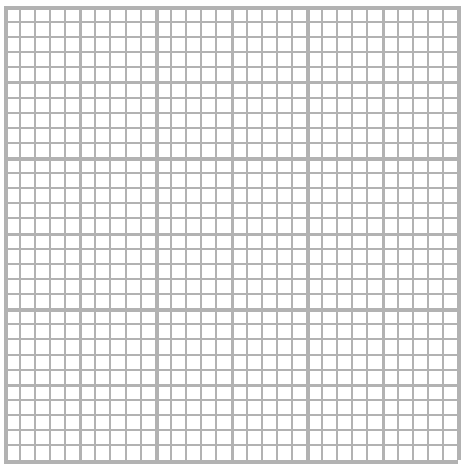
4. A student measured her breathing rate during a 12 minute period of exercise.

(a) Her results are shown in the table below.

Time in minutes	**Breathing rate in breaths per minute**
0	14
2	17
4	20
6	22
8	24
10	25
12	25

(i) On the grid plot a line graph to show how breathing rate changed with time.



(5)

(ii) Describe the changes in the breathing rate while the student was doing the exercise.

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(2)

Leave blank

(b) Use your scientific knowledge to suggest why there were changes in the breathing rate while the student exercised.

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(2)

(c) The student found it difficult to count her breaths while she was doing the exercise.

Describe and explain **one** way in which she could ensure her results were more accurate.

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(2)

Q4

(Total 11 marks)

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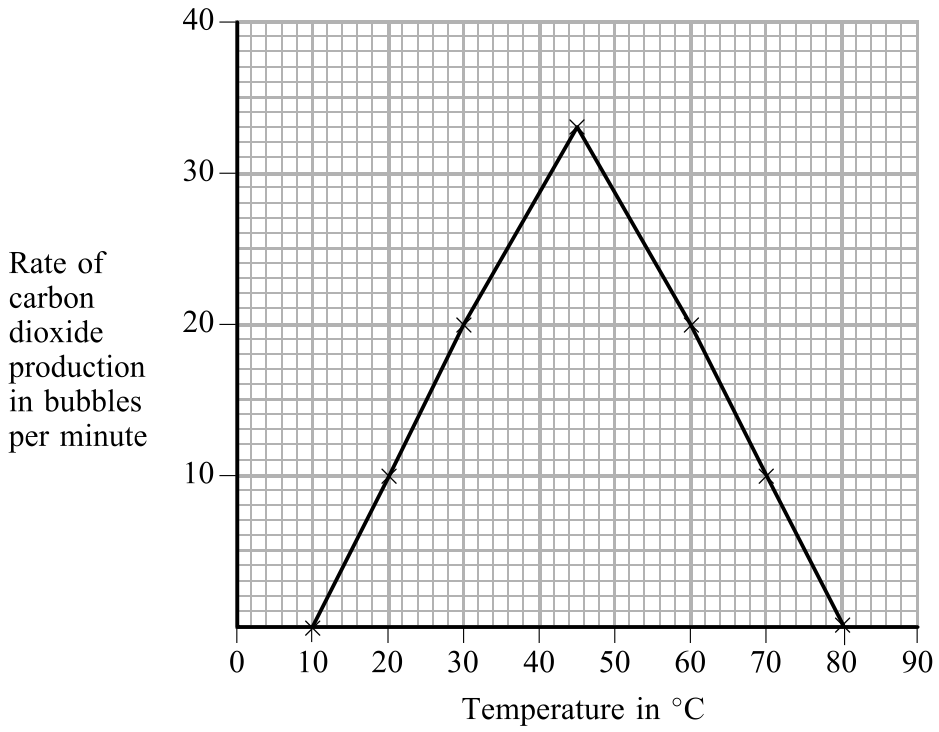
5. Yeast is used in the production of bread. Yeast cells respire and produce carbon dioxide which makes the bread rise. This respiration involves enzymes.

(a) A student carried out an investigation on the effect of increasing the temperature on the rate of carbon dioxide production in yeast. The graph shows the students' results.



(i) Describe and explain the results from 10 °C to 45 °C.

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(2)

(ii) Describe and explain the results from 45 °C to 80 °C.

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(2)

Leave blank

(iii) The graph suggests that 45 °C is the optimum temperature for the production of carbon dioxide.

Describe how you could modify this experiment to test this hypothesis.

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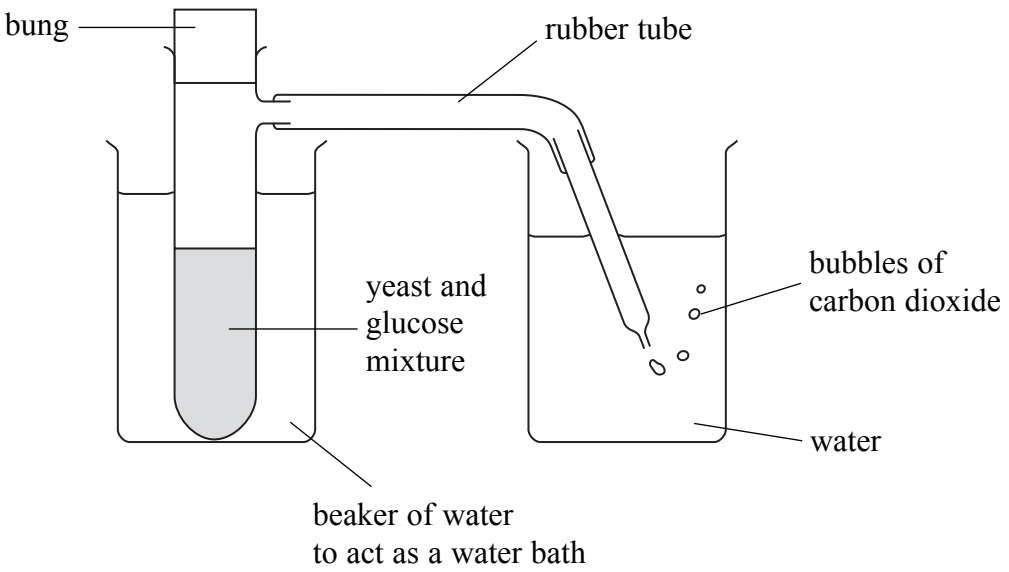
(3)

(b) This is the apparatus that was used to measure the rate of carbon dioxide production.



(i) State **one** key factor that should be kept constant when measuring the rate of carbon dioxide produced at the different temperatures, and suggest how this might be done.

Factor .....

How kept constant .....

(2)

Leave blank

(ii) The rate of carbon dioxide production was measured by counting the number of bubbles produced per minute. Explain why this is not a precise way to measure carbon dioxide production and suggest a more precise way of doing this.

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(2)

Q5

(Total 11 marks)

Leave blank

6. Transpiration is the evaporation of water from the surface of a plant.

Describe an investigation you could carry out to find out how temperature affects the rate of transpiration in a leafy shoot.

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Q6

(Total 6 marks)

TOTAL FOR PAPER: 50 MARKS

END