



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE
NAME

CENTRE
NUMBER

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CANDIDATE
NUMBER

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SCIENCE

5125/04

Paper 4 Biology

October/November 2011

1 hour 15 minutes

Candidates answer on the Question Paper

Additional Materials: Answer Booklet/Paper

READ THESE INSTRUCTIONS FIRST

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use a soft pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer any **two** questions.

Write your answers on the separate answer paper provided.

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.

For Examiner's Use	
Section A	
Section B	/
Total	

This document consists of **12** printed pages and **4** lined pages.



Section A

Answer **all** the questions in the spaces provided.

For
Examiner's
Use

1 Fig. 1.1 shows human blood seen through a microscope.

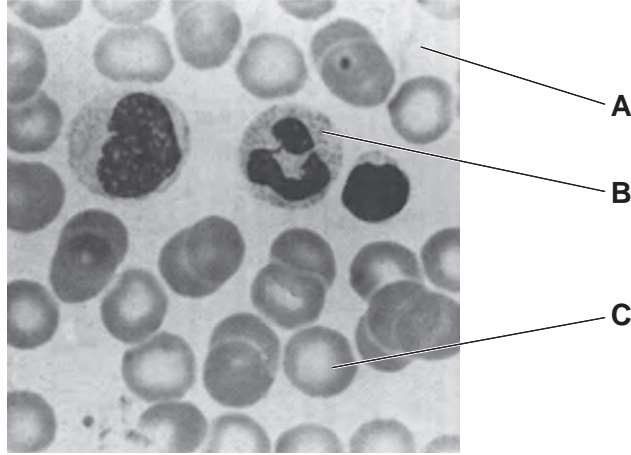


Fig. 1.1

(a) The part of the blood labelled **A** is plasma.

State two substances that are carried round the body dissolved in plasma and explain why the transport of each of these substances is essential.

- 1.
.....
.....
- 2.
.....
..... [4]

(b) State the name of the type of cell labelled **B** and describe the main function of this type of cell.

name

function

..... [2]

(c) C is a red blood cell. The function of this cell is to carry oxygen.

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Describe and explain two ways in which the structure of this cell is related to its function.

1.
.....
.....

2.
.....
..... [4]

[Total: 10]

- 2 A scientific study analyses data to find how the percentage of alcohol in a car driver's blood increases the risk of this driver having an accident. Results of this investigation are shown in Fig. 2.1.

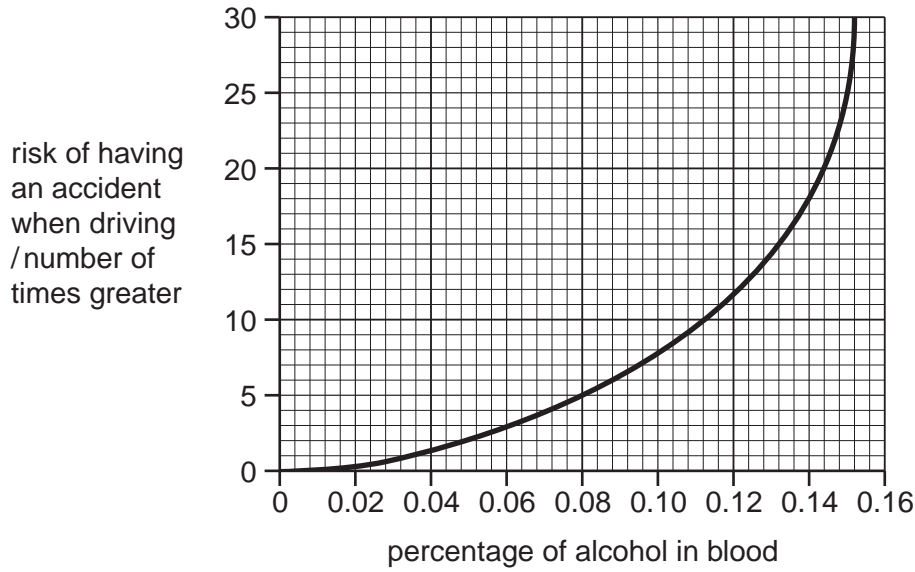


Fig. 2.1

- (a) Alcohol is a drug. Define the term *drug*.

.....

 [2]

- (b) A country sets 0.08% as the legal limit for the percentage of alcohol in a car driver's blood.

- (i) How many times greater is the risk of a car driver with this legal limit of alcohol in his blood having a driving accident?

..... [1]

- (ii) Some people think that the legal limit for alcohol in a car driver's blood should be less than 0.08%.

Use data from Fig. 2.1 to support this idea.

.....

 [2]

(c) (i) Suggest why drinking alcohol results in an increased risk of a car driver having an accident.

For
Examiner's
Use

.....
.....
..... [2]

(ii) Describe two other harmful effects that can result from the drinking of alcohol.

1.
.....
2.
..... [2]

[Total: 9]

3 The diagram in Fig. 3.1 shows the flow of energy through a food chain.

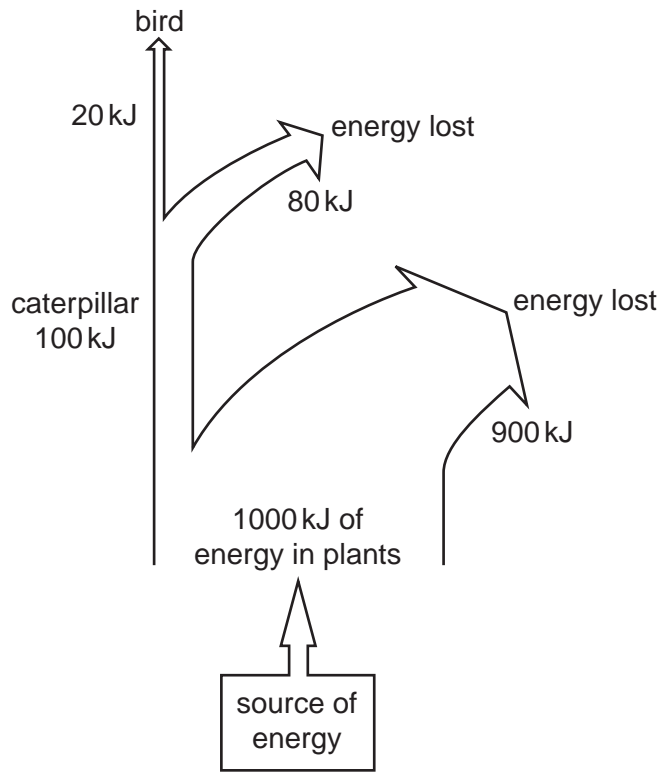


Fig. 3.1

(a) (i) What is the source of the energy in this food chain?

..... [1]

(ii) What percentage of the energy in the plants is transferred to the bird?

percentage =% [2]

(b) Some of the energy in this food chain is lost as a result of aerobic respiration.

(i) Write a word equation for the process of aerobic respiration.

..... [1]

(ii) Explain how energy is lost from the food chain during aerobic respiration.

.....

 [2]

(iii) Suggest two other ways by which energy is lost from this food chain.

*For
Examiner's
Use*

1.

.....

2.

..... [2]

[Total: 8]

- 4 A student uses the apparatus shown in Fig. 4.1 to investigate the effect of change in temperature on the rate of anaerobic respiration in yeast.

For
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Use

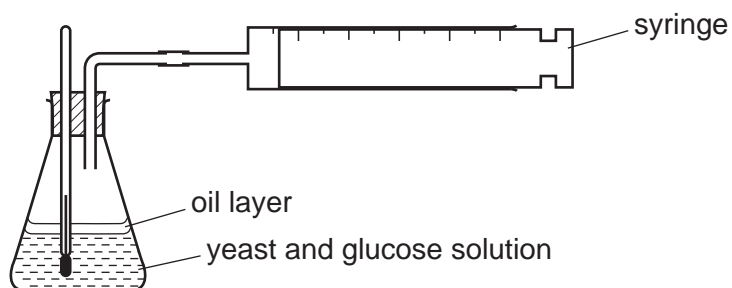


Fig. 4.1

She measures how much carbon dioxide is given off in 30 minutes and repeats the experiment at several different temperatures, keeping all other conditions constant.

Her results are shown in Table 4.1.

Table 4.1

temperature / °C	10	20	30	40	50	60
volume of carbon dioxide / cm ³	8	19	26	11	3	0

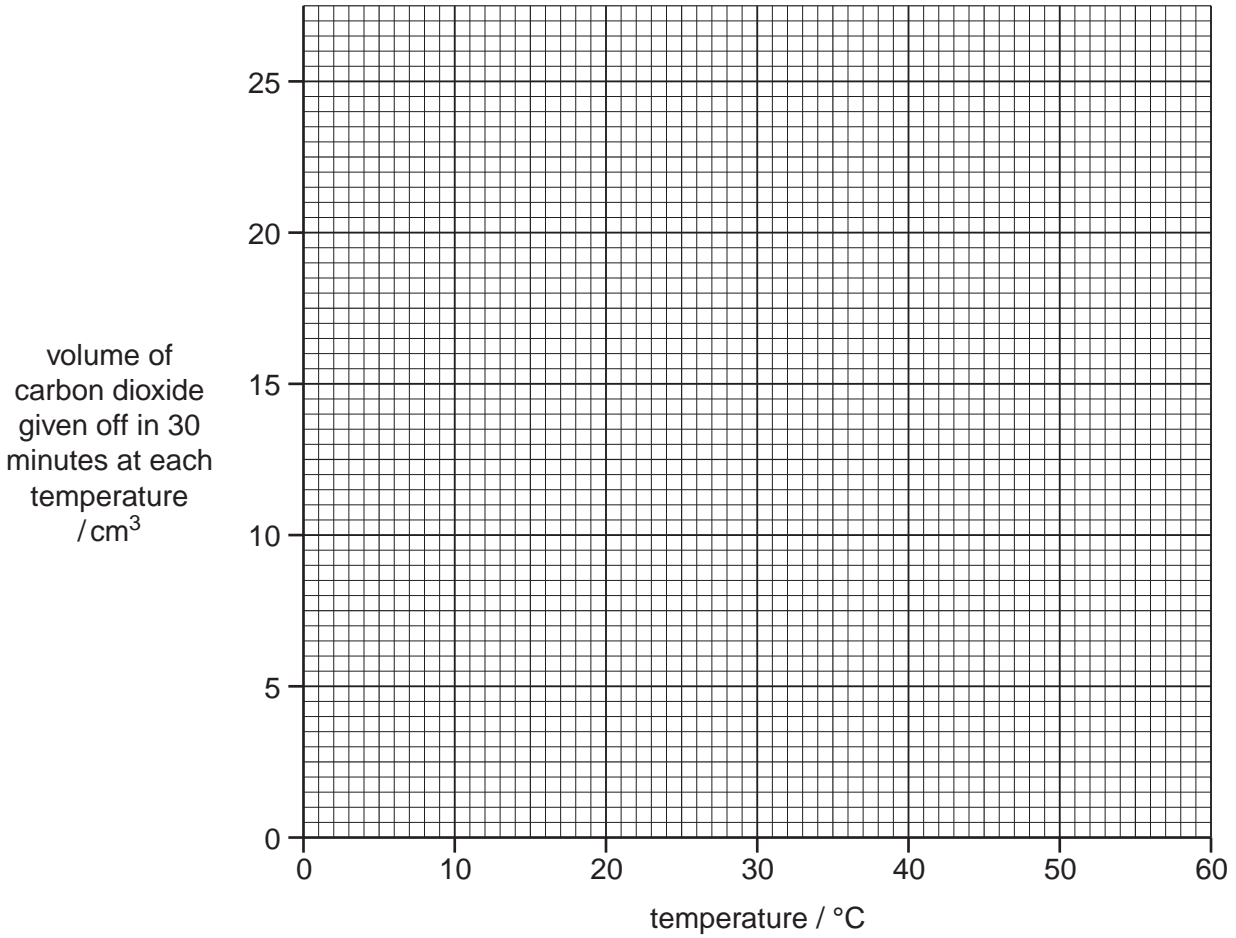
(a) (i) Plot these results on the grid.

[2]

(ii) Draw a curve of best fit.

[1]

For
Examiner's
Use



(b) Name two conditions that the student should keep constant at each temperature.

- 1.
- 2. [2]

(c) Use ideas about enzyme activity to explain the shape of your graph.

.....
.....
.....
.....
..... [3]

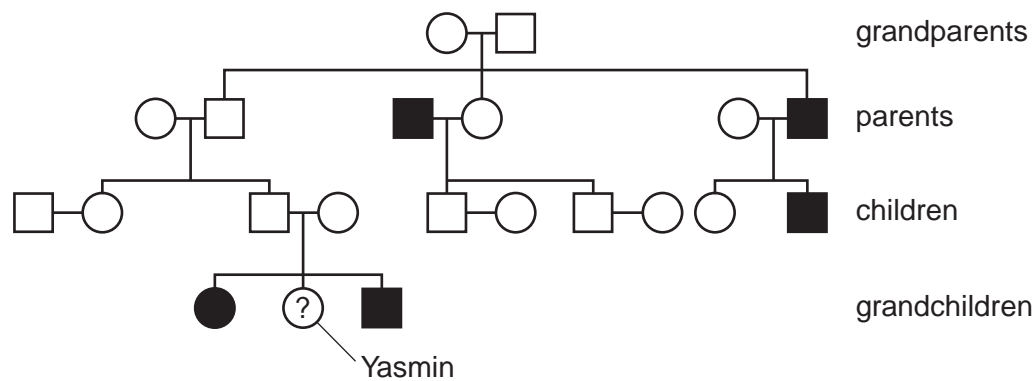
(d) Write a word equation for anaerobic respiration in yeast.

..... [1]

[Total: 9]

5 Cystic fibrosis is an inherited disorder caused by a faulty allele.

Fig. 5.1 shows how this disorder has been inherited in one family.



Key

- female with cystic fibrosis
- female without cystic fibrosis
- male with cystic fibrosis
- male without cystic fibrosis

Fig. 5.1

In this question, use **G** to represent the normal allele and **g** to represent the defective cystic fibrosis allele.

(a) Use examples from Fig. 5.1 to explain the meaning of the terms *genotype* and *phenotype*.

genotype

.....

phenotype

.....
 [2]

(b) Explain how Fig. 5.1 shows that the allele for cystic fibrosis is recessive.

.....

 [2]

(c) Each of the grandparents in this family tree has one allele for cystic fibrosis.

Explain how Fig. 5.1 shows that this is true.

.....

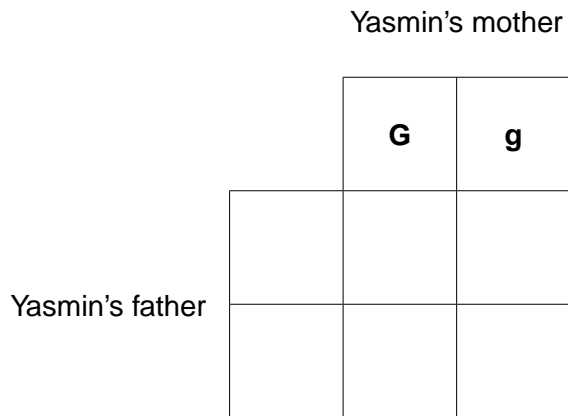
.....

..... [2]

For
Examiner's
Use

(d) What is the chance that the grandchild called Yasmin has cystic fibrosis?

Complete this diagram to work out your answer.



chance = [3]

[Total: 9]

Section B

Answer **two** questions from this section.

Write your answers on the lined pages provided and, if necessary, continue on separate answer paper.

- 6 (a) Fig. 6.1 shows a section through a flower.

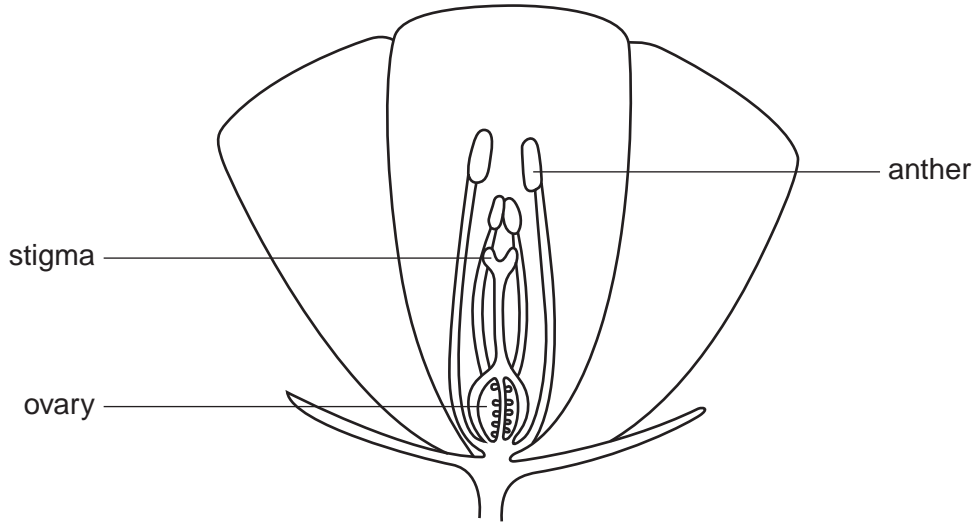


Fig. 6.1

Describe the processes of pollination and fertilisation in this flower. Use the labels from the diagram in your answer. [5]

- (b) Fruits and seeds may be dispersed by wind or by animals.
Explain the reasons for dispersal of fruits and seeds.
Explain one advantage of each of these two dispersal methods. [5]

- 7 (a) Define the process of transpiration and explain why it is important in plants. [4]

- (b) Describe how you would investigate the effect of change of temperature on the rate of transpiration. [6]

- 8 (a) Explain why the intake of energy-providing foods should be related to the age, sex and activity of a person. Suggest what effects an excessive intake of energy-providing foods may have. [5]

- (b) A balanced diet should contain the correct quantities of protein, carbohydrate and fat. What other types of nutrient should be supplied in a balanced diet?
Describe and explain the adverse effects of an insufficient supply of two nutrients of the types you have named. [5]

A series of approximately 35 horizontal dotted lines spanning the width of the page, providing a space for handwritten answers.

