

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**BIOLOGY**

Paper 3 Practical Test



**5090/03**

May/June 2006

**1 hour 15 minutes**

Candidates answer on the Question Paper.  
Additional Materials: As specified in the Confidential Instructions.

Candidate  
Name

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Centre  
Number

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Candidate  
Number

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**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all work you hand in.  
Write in dark blue or black pen in the spaces provided on the Question Paper.  
You may use a pencil for any diagrams, graphs or rough working.  
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **both** 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.

For Examiner's Use	
1	
2	
<b>Total</b>	

1 You are provided with two types of food, labelled **F1** and **F2**.

(a) Test some of **F1** and **F2** for starch, ensuring that you leave some of each for later in the question.

(i) Complete Table 1.1.

	observations		conclusions
	starch test	fat test	
<b>F1</b>	..... ..... .....	clear	..... .....
<b>F2</b>	..... ..... .....	cloudy / milky	..... .....

**Table 1.1**

[4]

(ii) Describe how you would carry out the test for fat.

.....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....

[3]

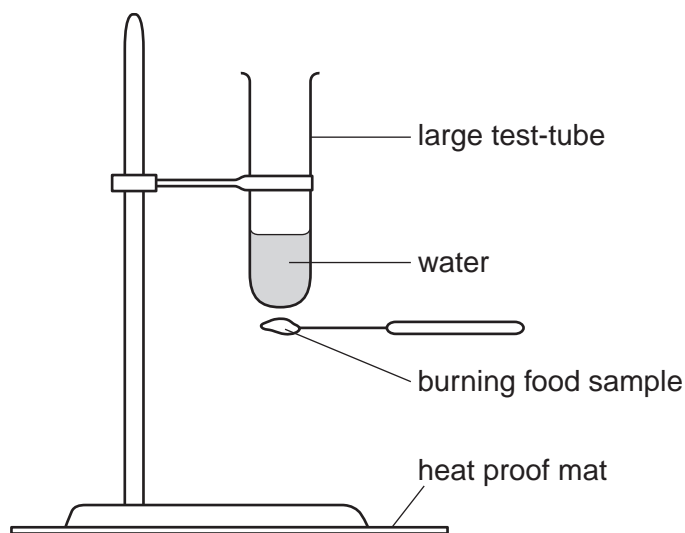
QUESTION 1 CONTINUES ON PAGE 4

(b) You are now going to find the energy content of each food.

**Read carefully all the instructions** before starting this section.

*Procedure*

- Place the retort stand on the heat proof mat.
- Support the large test-tube in the clamp attached to the retort stand as shown in Fig. 1.1.



**Fig. 1.1**

- Measure 20cm<sup>3</sup> of cold tap water and pour it into this large test-tube.
- Measure the temperature of this water and record it in Table 1.2.
- Firmly fix one piece of **F1** on to the mounted needle.

**Wear eye protectors and take great care when handling burning materials.**

- Use the burner to set fire to the sample on the end of the mounted needle.
- Immediately hold the burning sample underneath the large test-tube of water, until it has completely burnt out.
- Place the hot mounted needle on the heat proof mat to cool down.
- Measure the temperature of the water in the large test-tube and record it in Table 1.2.

Using a clean large test-tube, repeat this whole procedure using one piece of food. Recording your results in Table 1.2.

(i) Complete Table 1.2.

	mass of food / g	starting temperature of water / °C	final temperature of water / °C	rise in temperature of water / °C
<b>F1</b>	0.5			
<b>F2</b>	0.5			

**Table 1.2**

[5]

(ii) The amount of energy (in joules) in each gram of food can be calculated by using the following formula.

$$\text{energy} = \frac{\text{volume of water} \times \text{rise in temperature} \times 4.2}{\text{mass of food}}$$

Calculate the amount of energy per gram in **F1** and **F2**. Show your working.

**F1**

..... joules per gram

**F2**

.....joules per gram

[3]



(iii) Using the information from the food tests in **1(a)**, suggest reasons for any difference between the results in **1(b)(ii)**.

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

(iv) Suggest how the procedure used to find the energy in the food samples could be improved to ensure the results are more reliable.

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

[Total : 20]

2 The fruits **S1** are sultanas i.e. grapes that have been dried in the sun.

The fruits **S2** are similar sultanas that have been soaking in water for 24 hours.

(a) State **two** differences between **S1** and **S2**.

1 .....

.....

2 .....

.....[2]

(b) Test one of the **S1** sultanas for reducing sugar.

(i) Describe how you carried out your test.

.....

.....

.....

.....[3]

(ii) State your results and conclusion.

.....

.....[1]

(c) In terms of water potential, explain what has happened to **S2** while it has been soaking in the water.

.....

.....

.....

.....[3]

question 2 continues on page 8

(d) **S3** is part of a different kind of fruit.

(i) Make a large, labelled drawing of one of the cut surfaces of **S3**.

[6]

(ii) Examine the slice with a hand lens.  
Make a large drawing of one of the seeds and its attachment.

[2]

(iii) Calculate the magnification of your drawing in (ii).

Indicate on your drawing where your measurements were taken.

Show your working.

magnification = .....[3]

[Total : 20]