

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**BIOLOGY**

Paper 6 Alternative to Practical



**5090/06**

May/June 2006

**1 hour**

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

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

Answer **all** questions.

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

The number of marks is given in brackets [ ] at the end of each question or part question.

At the end of the examination, fasten all your work securely together.

| For Examiner's Use |  |
|--------------------|--|
| <b>1</b>           |  |
| <b>2</b>           |  |
| <b>3</b>           |  |
| <b>Total</b>       |  |

This document consists of **9** printed pages and **3** blank pages.



1 A student performed food tests on two types of food, **F1** and **F2**.  
The results are shown in Table 1.1.

(a) (i) Complete the table to show the student's conclusions.

|           | observations          |                  | conclusions    |
|-----------|-----------------------|------------------|----------------|
|           | fat test              | starch test      |                |
| <b>F1</b> | solution stayed clear | food went black  | .....<br>..... |
| <b>F2</b> | solution went cloudy  | food went yellow | .....<br>..... |

[2]

**Table 1.1**

(ii) Describe how you would carry out the tests for fat and starch.

fat .....

.....

.....

.....

.....

starch .....

.....[4]

- (b) The student then determined the energy content of **F1** and **F2** using the apparatus shown in Fig. 1.1.

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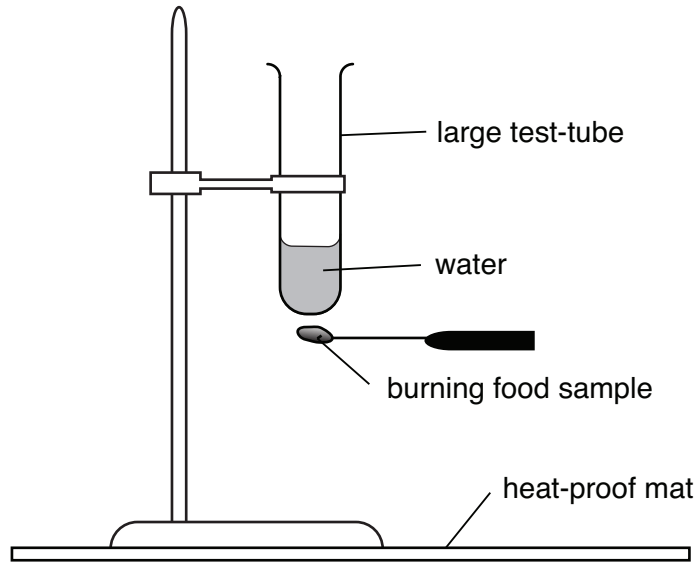


Fig. 1.1

Procedure used by the student

- The retort stand was placed on the heat proof mat.
- A large test-tube was supported by the clamp attached to the retort stand as shown in Fig. 1.1.
- 20cm<sup>3</sup> of cold tap water was measured and poured into the large test-tube.
- The temperature of the water was measured and recorded in Table 1.2.
- A sample of **F1** was weighed and its mass recorded in Table 1.2.
- The sample of **F1** was firmly fixed to a mounted needle.
- The sample on the end of the mounted needle was ignited.
- The burning sample was held underneath the test-tube of water, until it had completely burnt out.
- The temperature of the water in the test-tube was measured and recorded in Table 1.2.

The whole procedure was then repeated for **F2**.

- (i) Complete Table 1.2 to show the rise in water temperature for each food.

|           | mass of food /g | starting temperature of water / °C | final temperature of water / °C | rise in temperature of water / °C |
|-----------|-----------------|------------------------------------|---------------------------------|-----------------------------------|
| <b>F1</b> | 0.25            | 24                                 | 26                              |                                   |
| <b>F2</b> | 0.5             | 24                                 | 35                              |                                   |

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[1]

**Table 1.2**

- (ii) The amount of energy in each gram of any 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 of **F1** and **F2**.  
Show your working.

**F1**

..... joules per gram

**F2**

..... joules per gram

[3]

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

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

(iv) Suggest how the procedure used to determine the energy in the food samples could be improved to ensure that the results were even more reliable.

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

[Total : 15]

- 2 Fig. 2.1 shows three sultanas labelled **S1**, **S2**, **S3**.  
Sultanas are grapes that have been dried in the sun.



magnification X4

Fig. 2.1

**S1** is a sultana.

**S2** was a similar sized sultana that had been left to soak in water for twenty-four hours.

**S3** was a similar sized sultana that had been left to soak in concentrated sugar solution for twenty-four hours.

- (a) **S1** gave a positive result when tested for reducing sugar.

(i) Describe how you would test **S1** for reducing sugar.

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

(ii) Describe a positive result.

.....[1]

- (b) In terms of water potential, explain what you think has happened to **S2** while it was soaking in the water.

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

(c) Fig. 2.2 is a photograph of a section from a different fruit.

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**Fig. 2.2**

magnification X 1.5

(i) Make a large labelled drawing of the section shown in Fig. 2.2.

[5]

Fig. 2.3 is an enlargement of part of Fig. 2.2.

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**Fig. 2.3**

(ii) Calculate the magnification of Fig. 2.3.

Indicate on both photographs where your measurements were taken.

Show your working.

magnification .....

[3]

[Total : 15]









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