UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

8637460961

BIOLOGY **5090/62**

Paper 6 Alternative to Practical **May/June 2011**

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen in the spaces provided on the Question Paper.
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.

Answer **all** 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.

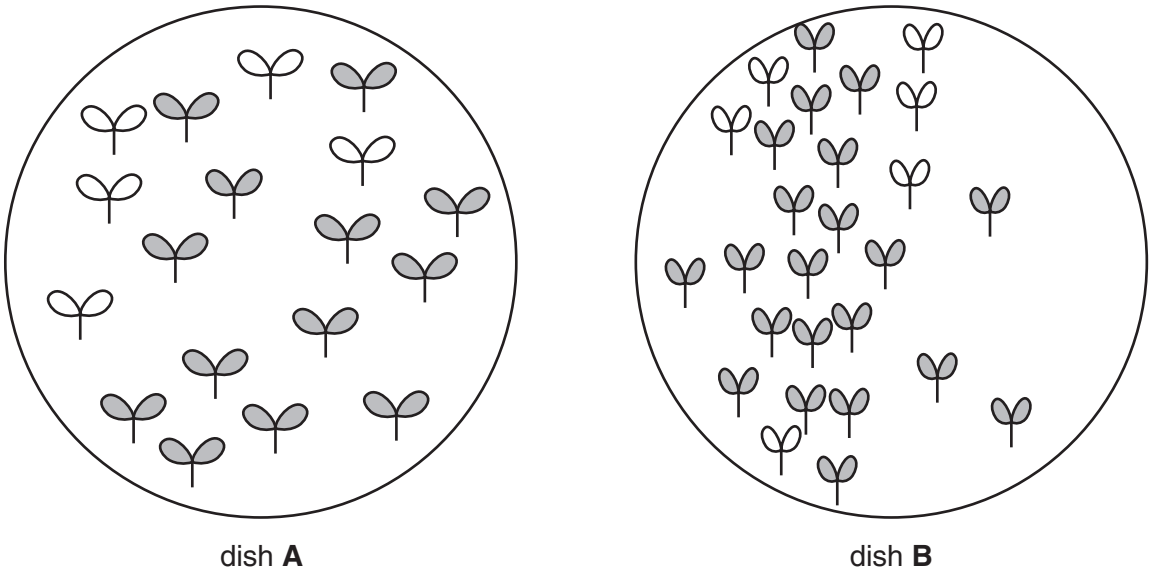
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1	
2	
3	
Total	

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

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1 An investigation was carried out into how the green pigment is inherited in tobacco plants. Two tobacco plants were cross-pollinated and the seeds were collected from the fruits that developed. These tobacco seeds were then placed at random on wet paper in two dishes and given suitable conditions for germination. Both dishes were exposed to light.
Fig. 1.1 shows the seedlings that developed.

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dish **A** dish **B**

Key
shaded = green
not shaded = white

Fig. 1.1

(a) Count the number of green seedlings and the number of white seedlings on the two dishes **A** and **B** and complete Table 1.1.

Table 1.1

dish	number of seedlings	
	green	white
A		
B		
total		

[2]

(b) Suggest and explain what these total numbers in Table 1.1 indicate about the inheritance of the green pigment.

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.....[4]

(c) Suggest how you could improve the reliability of this investigation.

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.....

.....[2]

(d) Suggest and explain which seedlings, given the right conditions, would be able to grow to become mature healthy plants.

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.....[3]

[Total: 11]

2 Fig. 2.1 is a diagram of a section through human skin.

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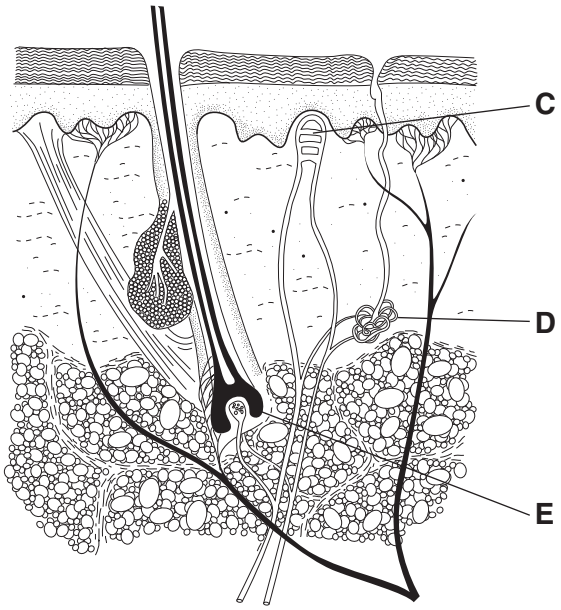


Fig. 2.1

(a) Identify structures **C**, **D** and **E**.

C .....

D .....

E .....

[3]

(b) Describe how structure **C** might be involved in maintaining a constant body temperature.

.....

.....

.....

.....[3]

[Total: 6]

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3 Fig. 3.1 shows sections through two different types of flower that may develop on the **same** marrow plant.

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Fig. 3.1

(a) Complete Table 3.1 by describing two visible differences between flower **F** and flower **G**.

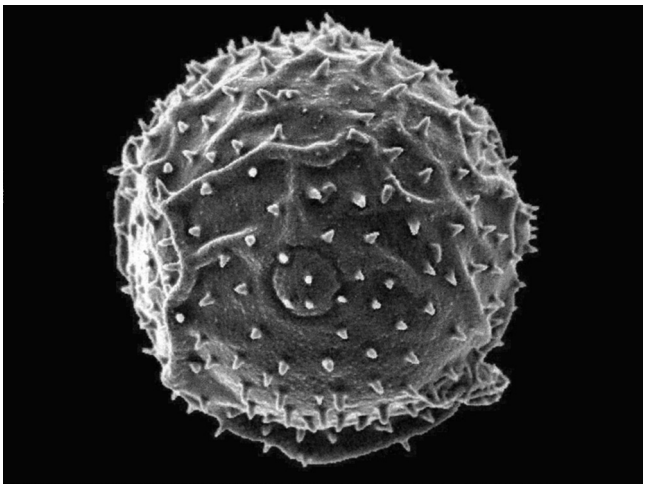
Table 3.1

difference	flower **F**	flower **G**
1		
2		

[2]

Fig. 3.2 shows a photomicrograph of a pollen grain from a marrow flower.

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scale: 0.05 mm

Fig. 3.2

(b) (i) Calculate the magnification of this pollen grain.

magnification .....[3]

(ii) Suggest, with reasons, how pollination occurs in marrow.

.....

.....

.....

.....[3]

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After pollination and fertilisation, the fruit develops. The fruits and seeds that develop from these flowers are usually edible.

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Fig. 3.3 shows a transverse section of a marrow fruit.



Fig. 3.3

(c) Make a large, labelled drawing of the section through the fruit to show the arrangement of the seeds and surrounding tissues.

[5]

Melons are closely related to marrows but the fruits of melons are sweeter than those of marrows.

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(d) Describe how you could carry out an investigation, using a simple food test, to compare the sugar content of melon and marrow fruits.

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.....[5]

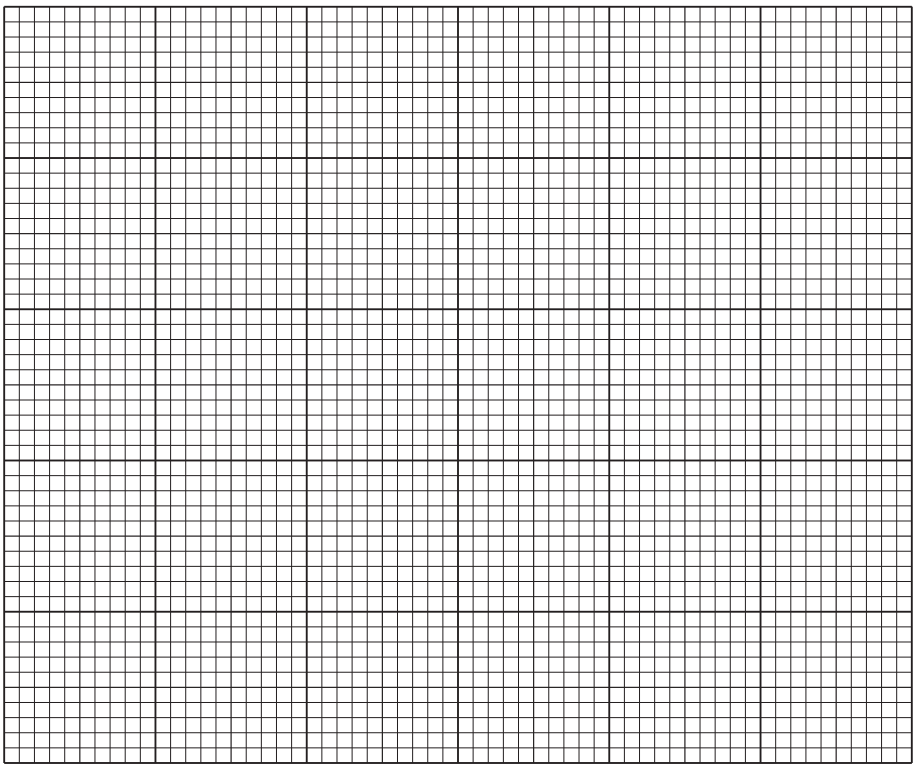
The sugar content of some other fruits is shown in Table 3.2.

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Table 3.2

sugar content g / 100 g of fruit				
melon	grape	ripe banana	pomegranate	apple
6.3	15.5	20.0	17.0	11.8

(e) (i) Draw a bar chart to show the sugar content of these fruits.



[4]

(ii) Calculate how many times greater the sugar content of 100 g of a ripe banana is than that of 100 g of a melon. Show your working.

.....[1]

[Total: 23]

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Copyright Acknowledgements:

Fig. 3.2 © *Pollen from Cyaponia jenmanii*; http://www.nybg.org/botany/tlobova/hequet/pollen_atlas.html.

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