UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	CANDIDATE NUMBER

4074697147

Biology **0610/51**

Paper 5 Practical Test **October/November 2013**

1 hour 15 minutes

Candidates answer on the Question Paper

Additional Materials: As listed in the Confidential Instructions.

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.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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	
Total	

This document consists of **10** printed pages and **2** blank pages.

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Read through all the questions on this paper carefully before starting work

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1 Seeds from the plant family *Papilionaceae* form an important part of the human diet.

You are provided with three different types of soaked seed: lentil (*Lens culinaris*), chickpea *(Cicer arietinum)* and soya bean *(Glycine max).*

Carefully observe these seeds with the hand lens.

(a) Describe the differences in shape **and** appearance of the seed coat (testa) between the three types of seed.

Write your answers in Table 1.1.

Table 1.1

feature	lentil	chickpea	soya bean
shape of seed			
appearance of seed coat			

[3]

(b) Describe the food tests you could carry out to show that these seeds contain:

(i) protein;

.....

.....

.....

..... [2]

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(ii) fat.

.....

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..... [3]

(c)

- Carefully remove the seed coat (testa) from one seed of each type.
- Separate the two parts of each seed (cotyledons) and place on a clean white tile.
- Add iodine solution to the cotyledons of each seed.
- Leave the seeds for at least five minutes.

While you are waiting continue with the rest of Question 1.

Record your observations and conclusions in Table 1.2.

Table 1.2

	type of seed		
	lentil	chickpea	soya bean
observation			
conclusion			

[2]

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(d) The percentage of protein and fat in five types of seed are shown in Table 1.3.

Table 1.3

type of seed	percentage of protein / %	percentage of fat / %
chickpea	8.0	2.5
lentil	9.0	0.6
lima bean	6.0	0.4
mung bean	7.0	0.4
soya bean	16.0	8.0

(i) Construct a bar chart to show the percentages of protein and fat in the five types of seed. Use the same axes for the two sets of data.

[5]

(ii) Meat is a good source of protein.

Name the type of seed in Table 1.3 that would be a good alternative to meat in the human diet.

..... [1]

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Fig. 1.1 shows part of a label from a packet of soya bean seeds. The label shows the energy content measured in kilojoules.

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Soya Beans

Nutrition

Typical composition	50 g serving provides
Energy	230 kJ
Protein	8.5 g
Carbohydrate	4.5 g
Fat	4.0 g

Fig. 1.1

Fig. 1.2 shows a simple calorimeter.
This apparatus can be used to find the energy content of a soya bean seed.
The soya bean seed is burned and the energy released is absorbed by the water in the test-tube.

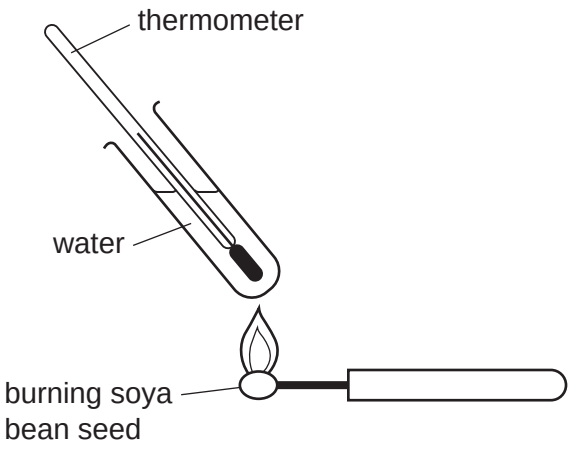


Fig. 1.2

(e) Suggest how you could **safely** carry out a simple investigation to find the energy content of a sample of soya bean seeds.
State what you would need to measure and control.

.....

.....

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.....

.....

..... [3]

[Total: 19]

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2 You will investigate the effect of solution **E** on cucumber.

- Remove the plastic film covering the section of cucumber.
- Cut a slice of the tissue from one end of the cucumber and discard.
- Cut one **thin** slice, no more than 2 mm in thickness, from the freshly cut end of the section of cucumber. Place the slice onto a clean white tile.
- Remove the centre from the slice as shown in Fig. 2.1.

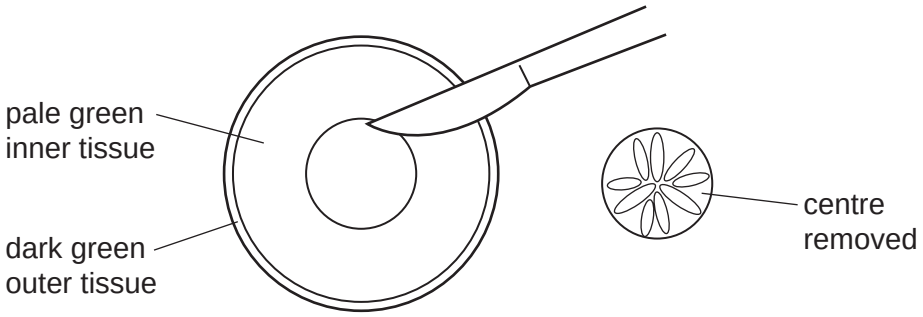


Fig. 2.1

- Cut the slice in half as shown in Fig. 2.2.

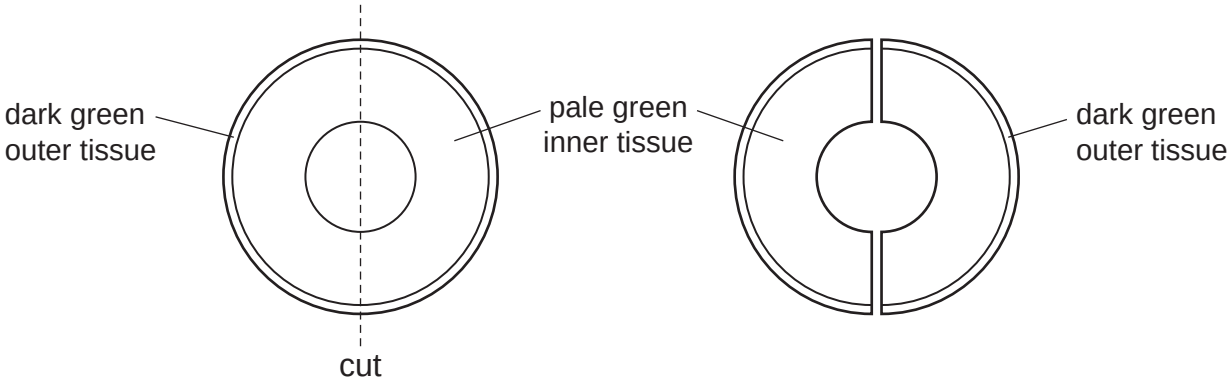


Fig. 2.2

- Use the forceps to place one piece of cucumber in each Petri dish.
- Label one Petri dish **E** and the other **W**.
- Cover the piece of cucumber in Petri dish **E** with solution **E.**
- Cover the piece of cucumber in Petri dish **W** with water.
- Leave the pieces of cucumber in solution **E** and water for 10 minutes.

While you are waiting continue with part (a) and Question 3.

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(a) Draw the shape of the two pieces in Table 2.1, as soon as you place them in the dishes.

Show and label the dark green outer layer.

Table 2.1

shape of piece of cucumber at start	
in Petri dish **E**	in Petri dish **W**

[2]

(b)

- After 10 minutes, look carefully at the two pieces of cucumber in Petri dishes **E** and **W**.

Draw the shape of the piece in Petri dish **E** and the piece in Petri dish **W** in Table 2.2.

Show and label the dark green outer layer.

Table 2.2

shape of piece of cucumber after 10 minutes	
in Petri dish **E**	in Petri dish **W**

[4]

(c) Explain the effect of solution **E** on the tissues of the cucumber.

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.....

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.....

..... [3]

(d) State **two** possible sources of error in the method used in this investigation.

Suggest a suitable improvement.

source of error .....

.....

improvement .....

.....

source of error .....

.....

improvement .....

..... [4]

[Total: 13]

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3 Slugs and snails are molluscs that can live in water or on land.

Fig. 3.1 shows a slug and a snail.



slug snail

Fig. 3.1

(a) (i) Describe **two** features, **visible** in Fig. 3.1, that suggest the slug and the snail belong to the same group of molluscs.

1 .....

2 ..... [2]

(ii) Describe **one** difference other than size**, visible** in Fig. 3.1, between the slug and the snail.

..... [1]

You are provided with a shell of a mollusc.

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(b) (i) Make a large, labelled drawing of this shell.

[4]

(ii) Suggest the importance of the shell to molluscs belonging to this group.

.....

..... [1]

[Total: 8]

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