UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

BIOLOGY **0610/61**

Paper 6 Alternative to Practical **May/June 2013**

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.
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.

This document consists of **11** printed pages and **1** blank page.

For Examiner's Use

1 Fig. 1.1 shows a bird's egg. Part of the shell has been removed.

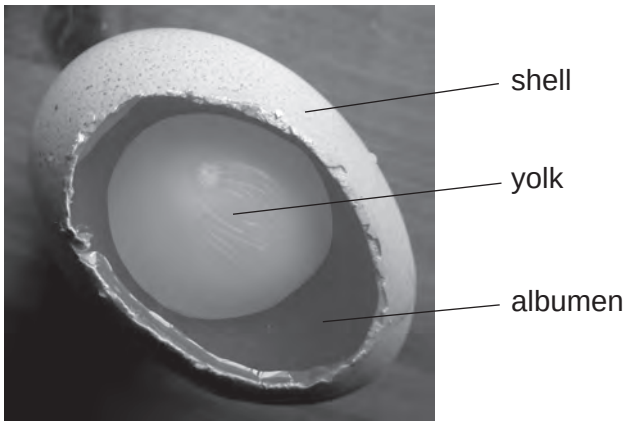

Fig. 1.1

Approximately 90 % of albumen is water. The remaining 10 % is made up of other substances such as reducing sugar.

(a) Describe how you could safely test a sample of albumen for reducing sugar.

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..... [4]

(b) A student tested some albumen for the presence of protein using Biuret reagent. The solution changed colour. It was a positive result.

Describe this colour change.

.....

.....

..... [1]

(c) Fig. 1.2 shows an experiment to investigate the effect of acid on albumen.

For Examiner's Use

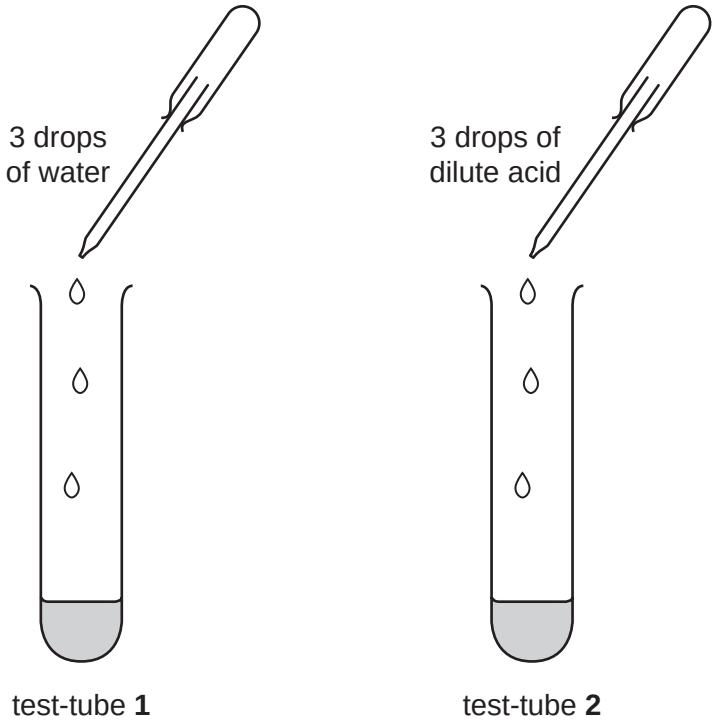


Fig. 1.2

The test-tubes were observed after five minutes.
The results are shown in Table 1.1.

Table 1.1

test-tube	observation
1	stayed as a clear liquid
2	changed from a clear liquid to a white solid

(i) State a conclusion that can be made from these results.

.....

.....

..... [1]

(ii) State why water was added to test-tube **1**.

.....

..... [1]

[Turn over

(d) Fat is present in the yolk.
A student carried out the emulsion test on a sample of yolk and it gave a positive result.
State what the student would observe.

.....

..... [1]

For Examiner's Use

(e) Two students wanted to investigate the effect of concentration of acid on albumen.

For this investigation, suggest a suitable:

variable to change; .....

variable to measure or observe; .....

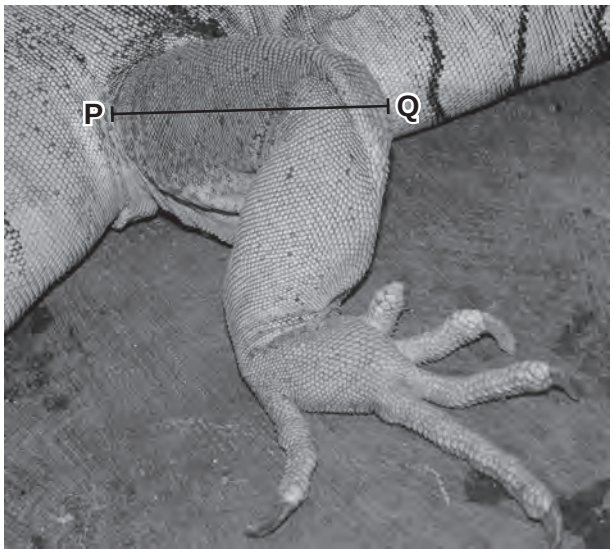
variable to control. ..... [3]

[Total: 11]

2 Fig. 2.1 shows the back leg of two animals.

For Examiner's Use

The animals belong to two different vertebrate groups.



animal **A**

animal **B**

Fig. 2.1

(a) (i) Describe **one similarity**, **visible** in Fig. 2.1, between the leg of animal **A** and the leg of animal **B**.

.....

.....

..... [1]

(ii) Complete Table 2.1 to state **two differences**, **visible** in Fig. 2.1 between the leg of animal **A** and the leg of animal **B**.

Table 2.1

feature	animal **A**	animal **B**

[3]

(b) Make a large, labelled drawing of the leg of animal **A**.

For Examiner's Use

[5]

(c) You are going to calculate the magnification of your drawing of the photograph of the leg of animal **A**.

Length of line **PQ** in Fig. 2.1 is 36 mm.
Draw line **PQ** on your drawing in the same position as in Fig. 2.1.

Length of line **PQ** in drawing ..... mm

Calculate the magnification of your drawing.
Show your working.

magnification × ..... [3]

(d) A population of animals was studied over nine years. The changes in the population of **males** are shown in Fig. 2.2

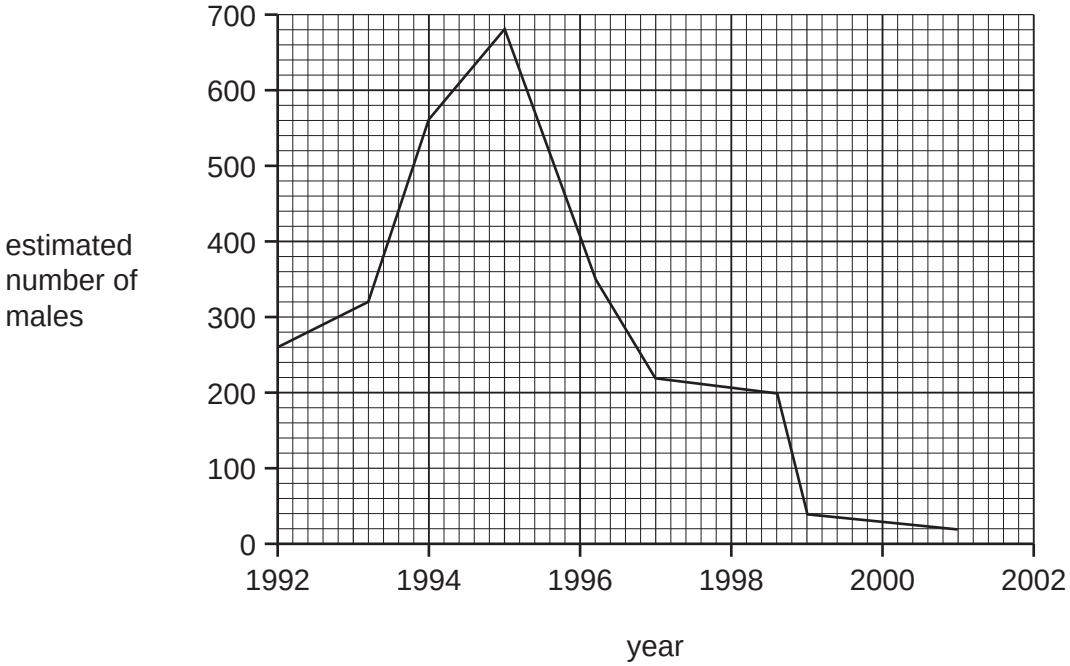


Fig. 2.2

(i) Use the graph to estimate the **total** population of males **and** females in 1992. Assume that the number of males and females is equal.
Show your working.

total population of males and females ..... [1]

(ii) Describe the changes in the population from 1992 to 2001.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 16]

[Turn over

For Examiner's Use

3 **(a)** An investigation was carried out on the growth of onion seedlings.
Onion seedlings were grown in a tray.
One millimeter was removed from the tips of all of the onion seedlings on the left side of the dividing line, as shown in Fig. 3.1.

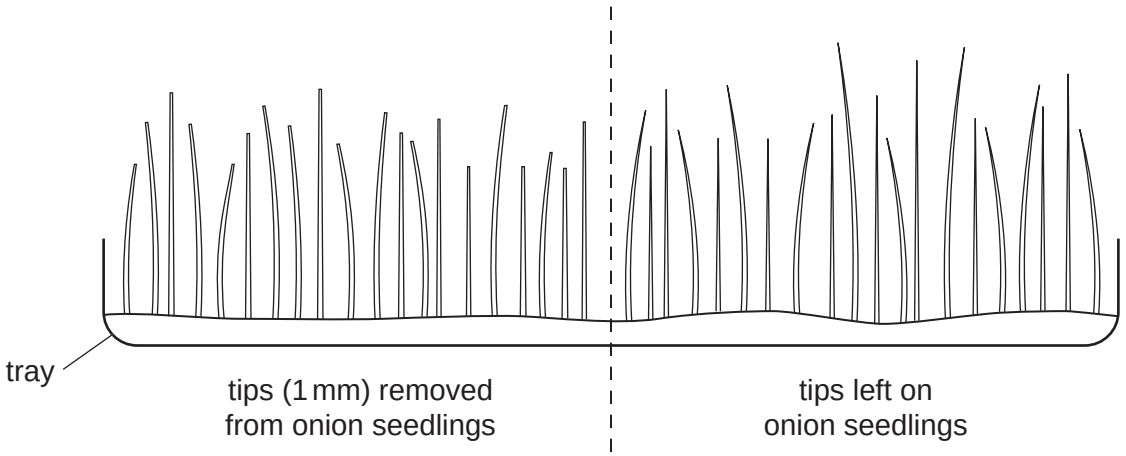


Fig. 3.1

Ten onion seedlings were cut at soil level from each side of the tray.
The heights of these onion seedlings were measured and recorded.
These are shown as the start heights in Table 3.1.

After three days, ten more onion seedlings were cut from each side, measured and recorded. The heights are shown in Table 3.1.

(i) Suggest why the onion seedlings were cut and removed from the tray before they were measured.

.....

..... [1]

(ii) State why a sample of ten onion seedlings is better than a sample of three onion seedlings.

.....

..... [1]

Table 3.1 shows the heights of the onion seedlings at the start and of those measured after three days.

Table 3.1

	height of seedling / mm			
	tips removed		tips left on	
	start	after three days	start	after three days
	84	70	70	63
	61	76	79	65
	54	63	57	83
	57	76	58	79
	56	80	53	83
	62	71	52	74
	68	73	61	76
	45	60	63	60
	64	76	51	85
	49	75	76	62
total height / mm	600		620	
mean height / mm	60		62	

(iii) Complete Table 3.1 by calculating the total height **and** mean height of the onion seedlings after three days. [2]

(iv) Calculate the mean **increase** in height of the onion seedlings:

tips removed ..... mm

tips left on ..... mm [1]

(b) The experiment was repeated with another tray of onion seedlings.
The same experiment was then performed on beetroot seedlings.
The results are shown in Table 3.2.

Table 3.2

mean increase in height / mm			
onion seedlings		beetroot seedlings	
tips removed	tips left on	tips removed	tips left on
10	9	1	7

(i) Draw a bar chart on Fig. 3.2 to show the data in Table 3.2.

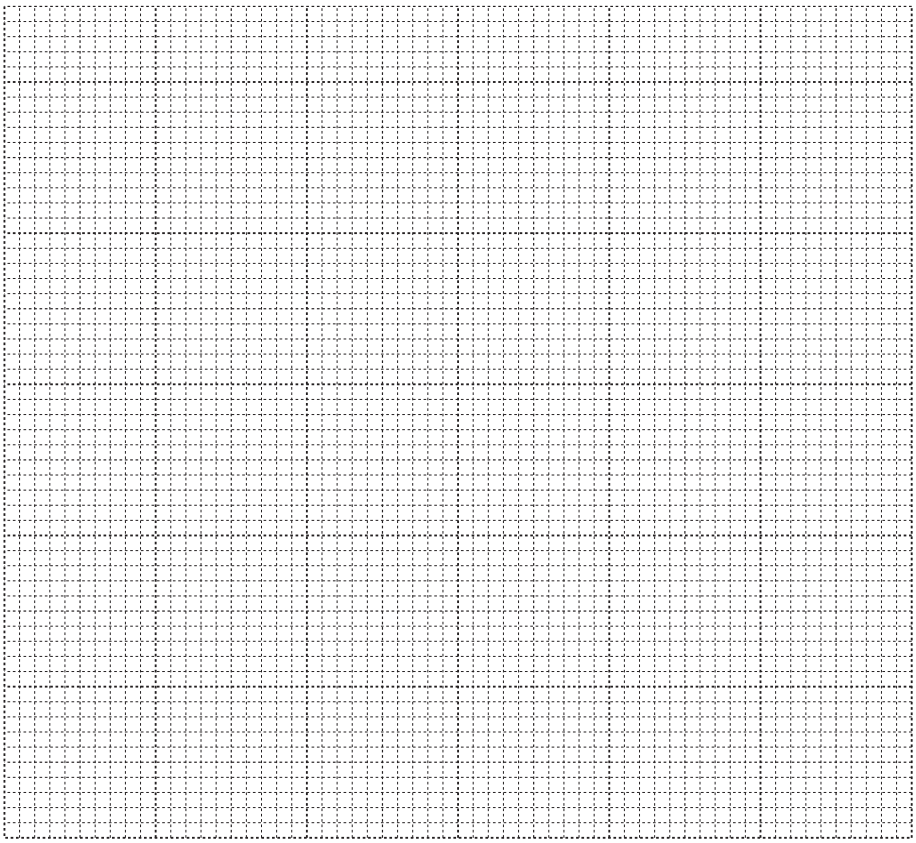


Fig. 3.2

[4]

For Examiner's Use

(ii) Describe the effect of removing the tips on the growth of onion and beetroot seedlings.

onion .....

.....

beetroot .....

..... [2]

(iii) Suggest where growth takes place in the shoots of onion and beetroot seedlings.

onion .....

.....

beetroot .....

..... [2]

[Total: 13]

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