

	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.

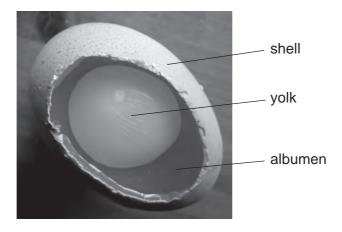
Electronic calculators may be used. You may lose marks if you do not show your working or if you do not use appropriate units.

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.



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



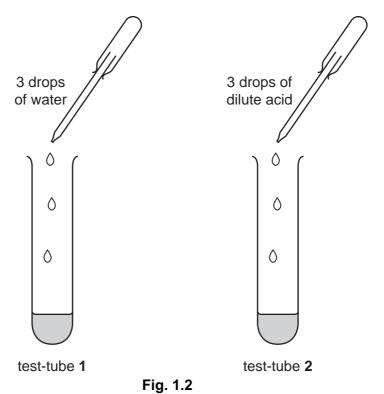


Approximately 90% of albumen is water. The remaining 10% is made up of other substances such as reducing sugar.

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

		[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]

For Examiner's Use (c) Fig. 1.2 shows an experiment to investigate the effect of acid on albumen.



a abcorriged after five min

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

Table	e 1.1

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

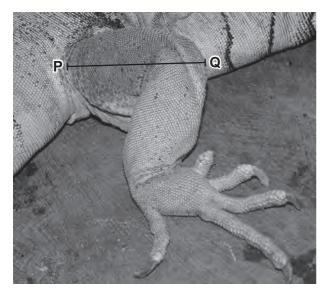
(i) State a conclusion that can be made from these results.

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

(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.	For Examiner's Use
	[1]	
(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.

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**.

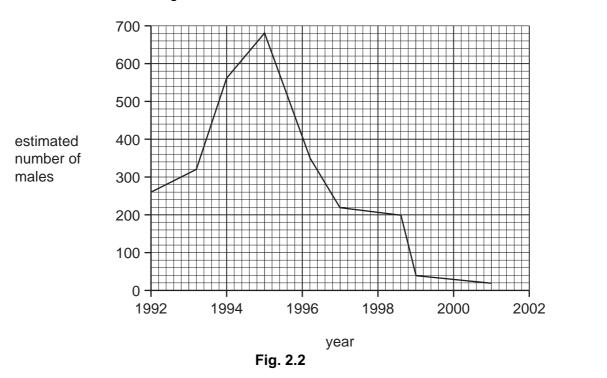
Length of line **PQ** in Fig. 2.1 is 36 mm. Draw line **PQ** on your drawing in the same position as in Fig. 2.1.

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 Examiner's

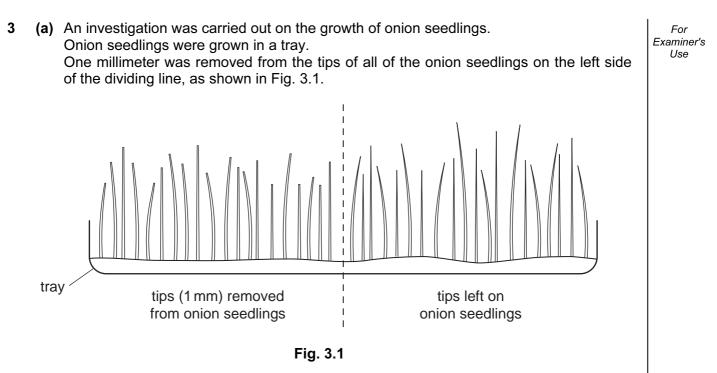


(i) Use the graph to estimate the total population of males and females in 1992. Assume that the number of males and females is equal. Show your working.

	total population of males and females [1]
(ii)	Describe the changes in the population from 1992 to 2001.
	[3]
	[3]
	[Total: 16]

For

Use



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]

8

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

For Examiner's Use

	height of seedling/mm												
	tips re	moved	tips l	eft 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										

Table 3.1

- (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.

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

Table 3.2

10

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

			111		****																																
									1	1 1	1	1		1	111				· †···			-†-	-1-1	 111	÷	1-1-		1-1-	11	 111		11		111		1	11
	10.00	- 1	111	1	11	1	1		1	11			177	1	111	1	111				117	1	11	 111	1	11		111	11	 11	1	11		111		1	111
			111	1	11	11	1		-T	11		111	177		111	1	1				11	T		111	1	TΤ			11	11	1	11				T	
	111	- T	111	T	ŤΤ	111	1		-T	11	- 1-	111	m	11	111	1	T	1	7		11	T	777	 TT	Ť	11		1.1.1	m	ΠT	T	Πĩ		11		T	11
	777		111		77					777			111	- P.	111							17		 	· ? · ·	111			713	 		m				7	111
1111	111		11		11	1			T		1			11	TT	1	10					T			1	T I			71	11	1	11				T	11
			111		11	1			1	11				1	111				1			T			1				11	11	1	11				T	11
1.1	1		111		1	1				11			1		11							1		 111		11			11	11		1				1	1
111	1	1	111		1	1				11	1				111	1	1		1			1		 11	1	111		111	111	11	1	1				1	
111	10		11		TΤ				- F	11					111						111	1		 11		ΠI			773		1	11				1	11
111	10		11		TΤ				- F	T			11	1	111						111	T	77	 TT	1	ΠI			m		1	m				T	m
1.1.	100		111		11	11			Ш.	10			E.I.	11.	111							11.		 1.1	1.				10	1.1	1	0				1.	111
1.1.									1			1		1								1			1				10							1	
1.1.	1.1				: :	1	1			1 1				1	1.1			1	1		1 1	1	1.1	1.1		1 1	1		1.1			1 1				1	
	10	1		1		1			Π.	11	11	1		1	111	1	1		1		111	T			T	11	1		10		T	111				T	
1.11	10		11		LT				[]	10			1.1		111				.[1.1				1.1	10							1	10
.if	.1.)		.iI		LĬ			I(1.3	[ií		J]		.1.]						.1.3	 .i(.1	1. J.		iC	10	 1(.1.	LÌ			L.C	11	1.)
.1C	.1.3		1.1		LÏ		1.1	[1.1		.1.	L.I		11		.1.]		.1			Ш.	.1.]	 1[.1	1.1		1(1.)	 1(.1.	LI		.1]		11	1.1
	1.1		1.1		1.1					11			1.1		1.1				.1					 1.1	.1	1.1		L.L.	11	 	1	1.1				1	
1.1	1.1		1.1		11	4				4.1		4	1[1.1				.1					 1.1		1.1		1	1.1	 1.1	4.	1.1				4	1.1
4.4	11		41		ĻĴ	4.		L.Í		11	[1		Ļ.ļ		1		.l			4		 4		Ļ. j		ļ [.	11	 1.1	4	ĻĴ			L	4	Ц
4-4-	4.1	į	44		į.į	. į.,		L.	ļ	44		4	1		į., į.		.j	L.	. į					 	. į	Ļ.į.		i	1.1	 i		L.	į	4	-		į.,į
	1.1	j	11	i	1.1		.ii		i.	.1).).	.i	ii	. Å	J., J.	. i	.i)	i.,	. j			l.,	.jj	 .ii.	. i	J., J.	İ	i	1.1	 i		i i	j	.ii		.i.,	J., J
			11	i	1.1				i.			.i	i		J., J.		.i)		. j					 .ii.	.i	J. J.		i	1.1	 ii.	.i					.i.,	
			1.1		1.1					11			1		1.1.									 		11.		L.L.	1.1	 L.I.						4	
			41		1.1		4			44					44									 		1		ļļ.	4.4	 						4	1.1
4.4.4.	4.4		44		1.1		4			4.4		-i	ļ		1									 		1		ļļ.	4.4	 i						4	
-++-	4.4		44		4-4	- d				4-4		- į	į)		44.								j	 4		4-4-		ļļ.	4.4	 i		įį		. i i			44
	4.4	į	44		4.4		4			4.4		-i	į)		įį.		.i							 4		Į., į.		ļ	4.4	 i		į		.i			įį
	4.4	į	4-4		4.4		4			4.4	į	-÷			įį.		. <u>.</u>							 .i	į	į., į.		ļļ.	4.4	 ļ., ļ.		ļ	į	.i			įį
	4.4	į	44	į	1.4		4			4.4	į		1		44		4							 44		įį.	į	i	4.4	 i		1.1	į			÷	4.4
			44		4-4					4-4			ļ;		4-4		4							 		4-4		ļļ.	4.4	 ļļ.						4	4-4
-++-			44							4-4			ļ,		44-							-4-		 		44-		ļļ.	4.4	 i						4	
-44-	4.4		44	·	÷	 -	44	·		4.4	i-	-÷	j;	- de e	4-4		;						-44	 		44-		jj.	4.4	 i				i	·		ii
			44		÷-+		4	-							÷-+		· • - • •				++			 · • • • • •		<i></i> {∤-	·	÷	÷-4	 ֥		÷{		·	·	-}	} ∤
	- <u>-</u>				÷-+	- ÷	÷						·	-÷-	÷-+		·+							 · • • • •	·÷	÷-+	·	÷÷-	÷-4	 ֥	-+	÷				÷	
	+		÷+		+-+		÷			++				-+-	÷-+				·				-+	 ÷	·+-	+-+		÷÷-	+	 ÷÷-	- <u>+</u>					+	
	+-+	-+-	÷-+	·	÷÷	-+	÷	÷÷	-+-	++		-÷	ł	· ÷ ·	÷÷÷	-+	÷		· † · ·		-+-+	-+-	-+-+	 ÷÷	· ÷ · ·	÷÷	·-÷	÷÷-	÷÷	 ÷	÷	÷÷÷		÷÷		÷	÷÷
-++-	+		·	·-+	÷÷		· i	÷	<u>-</u>	+-+		-+			÷÷	-+	÷}		· { · · ·					 ÷÷	·+	÷÷÷	·-+	łł-	$+ - \frac{1}{2}$	 tt-	·	÷		÷		+	÷
-+	+		·	-+	÷÷					+-+		-+	}}	÷÷÷	÷÷	-+	+	÷	· {· · ·					 ÷	· † · ·	ł	·	}	± 1	 tt-		÷		·+··		+	÷
	÷		· +	·	ł÷			ŀ		+-+		- <u>†</u>	<u>}</u> }	÷÷	÷÷		· •	÷	.÷					 ÷	·÷-	<u></u>	·-+	••	÷	 tt-		ł		····		÷	ł-ł
	+		+-+	<u>†</u>	÷÷		÷			+-+		- <u>†</u>		-÷-	÷÷		· • • •		·					 ÷	·÷-	÷÷	<u>†</u>	·	÷	 ÷	- <u>†</u>			÷		+	÷
	+		+-+		++		÷			++			÷÷	-+	++		· • - •		· † · ·					 ÷÷	·+··	++	·-+	÷	+ - + - + + + + + + + + + + + + + + + +	 ÷	+			÷		+	÷
	÷	÷	÷-+	·	†-†		÷		÷	÷÷			÷÷	÷	÷÷	·	÷		÷			-+-		 ÷.+	÷	÷÷	·-••	÷-+-	÷÷	 ÷	÷÷	÷	· · † ·			÷	÷
	***		····	-+	†÷†		÷	÷	÷÷	+-+		-+	t de	· † ·	÷÷÷	-+	÷	÷	÷÷··		-+-+	÷÷	- †- †	 t-t	·†··	÷÷	·-+	tt-	÷	 ii-	·-+	ŕή		111		+	i i
-11-	$\dot{\gamma}\gamma\dot{\gamma}$	÷÷	1-1	-+	ΥŤ	- †	111	l d	÷ŀ	***		-†	ĿŶ	τţ.	trt	-+	11	÷÷	÷÷	+-	-+-+	-t-		 ++	÷	†-†	·-+	łł-	Υń	 terte	·†	Υġ		111		+	† i
1-1-	$^{+1}$	÷	111		î î	11	111	l d	-11	$\uparrow\uparrow\uparrow$	†-	-1	htt	121	t t	-+	1-1	Ċ.	÷	+-		-7-	11	 ++	***	trt	·-+	<u>}}-</u>	211	 trt	1	t t	{	11		\uparrow	竹
111	111		111		11	- 1	111	1		11	†-	- 1	m	111	trt	-1	111	÷÷;	· † · · ·		-1-1	-7-	111	 111	111	11		1-1-	11	 111	11-1	ŕή		111		7	11
	11	÷	11		11		1	m	÷			111	m		тt		11		1					 ΤŤ	1	11	·-+	1-1-	71	 - 1	1	- 1	· · · ·	11		7	11
-1-1-	11		11		t		1			+-+				÷	$^{++}$		÷		÷					 tt	÷.	t t	·-••	·	11	 11	1					+	
	11	÷	1-1	·-†	† †		i-i		<u>†</u> -	+++		- <u>†</u>	:	÷÷	tt	- <u>†</u>	÷	1	÷					 tt	÷	† †		t-t-	tri	 111	֠	i i	÷	÷		+	in i
-++-	***	· • • •	11	·-+	ŤŤ		1-1		÷	$\uparrow\uparrow$		-+	t-t	· † ·	† †	-+	1-1	t the	· ;· · ·			÷÷	i	 trt	· † · ·	trt	+	tt-	ΥŃ	 ††-		'nή		1.1		41	(m)
-11-	***		1-1		ΥŤ		1-1			$\uparrow\uparrow$	†-	-+	htt	÷÷	trt	-+	1-1	t the	· †…				11	 1-1-	·†	trt	+		***	 ††-		Υŕ		11		1	行手

Fig. 3.2

For Examiner's Use

[4]

(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.
	beetroot
	[2]
	[Total: 13]

11

For Examiner's Use

BLANK PAGE

12

Copyright Acknowledgements:

Question 2 Figure 2.1

© Peter Skinner / Shepreth Wildlife Park

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

University of Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.