

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Ordinary Level

**BIOLOGY**

Paper 6 Alternative to Practical



**5090/06**  
May/June 2005

**1 hour**

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

Candidate  
Name

Centre  
Number

--	--	--	--	--

Candidate  
Number

--	--	--	--

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name in the spaces provided at the top of this page.  
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.

Answer **all** questions.

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

DO NOT WRITE IN THE BARCODE.

DO NOT WRITE IN THE GREY AREAS BETWEEN THE PAGES.

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



1 You are going to consider two investigations into how the eye works.

Read through the instructions for each investigation before carrying it out.

- (a) ● With your left hand cover your left eye to start the first investigation.
- With your uncovered right eye, look steadily at the cross shown in Fig. 1.1 below.
- do not let your gaze wander.
- Slowly move your head towards the question paper while looking steadily at the cross in Fig. 1.1.
- Notice what happens to the dot **without looking directly at it**.

At a certain distance from your eye the dot will disappear from view.



Fig. 1.1

Use your ruler to measure the distance of the question paper from your eye when the dot disappears.

(i) Record this distance.

distance ..... [2]

(ii) The dot disappears when the light from the dot lands on part of the retina called the blind spot. It is where the optic nerve leaves the retina. A blind spot exists in both eyes.

Suggest why we are not aware of the blind spot when both eyes are open.

.....

.....

.....

..... [2]

(b) (i) Fig. 1.2 is a photograph of an eye for use in the second investigation.

Use your ruler to draw straight label lines and label **both** the **pupil** and the **iris**.



Fig. 1.2

[2]

- (ii) A student in a brightly lit room covered both of her eyes with her left hand while holding a mirror in the other hand. The student closed her eyes. She counted slowly to 60. Then she quickly removed her hand from her eyes, opened them and looked in the mirror. Make drawings of what her iris and pupil would look like, as they appeared when the eye was first uncovered and about one minute later.

For  
Examiner's  
Use

Appearance of iris and pupil when first uncovered.	Appearance of iris and pupil about one minute after uncovering.
---	--

[2]

- (iii) Explain how the changes shown between your drawings in (b)(ii) occurred and how these changes help the functioning of the eye.

.....

.....

.....

.....

.....

.....

.....

.....

.....

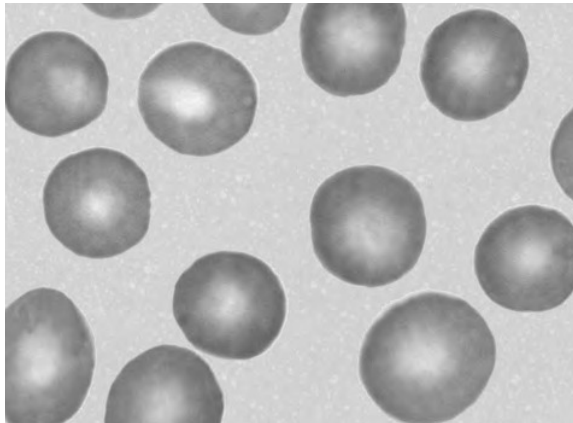
.....

..... [6]

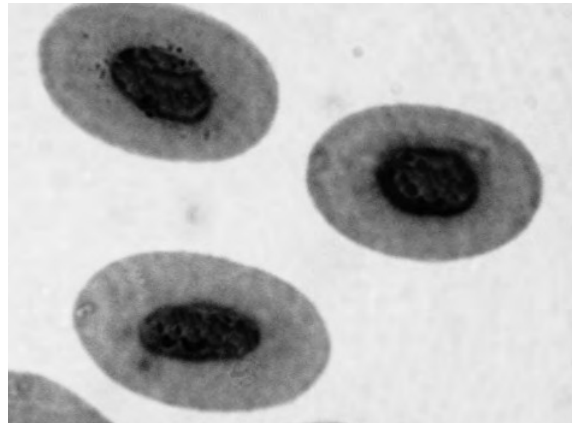
[Total : 14]

2 Fig. 2.1 and Fig. 2.2 are photographs of some cells **to the same scale**.

For  
Examiner's  
Use



**Fig. 2.1**



**Fig. 2.2**

(a) (i) The tissue from Fig. 2.1 is from a human.

Name this tissue.

..... [1]

(ii) Make a large, labelled, drawing of **two** cells from Fig. 2.1.

[3]

(iii) Make a large, labelled, drawing of **two** cells from Fig. 2.2.

[3]

(b) Complete Table 2.1 to compare the cells in Fig. 2.1 with the cells in Fig. 2.2 by listing **two** visible similarities and **two** visible differences.

For  
Examiner's  
Use

**Table 2.1**

	cells in Fig. 2.1	cells in Fig. 2.2
differences	1. ....	.....
	.....	.....
	2. ....	.....
	.....	.....
similarities	cells in both Fig. 2.1 and Fig. 2.2	
	1. ....	
	.....	
	2. ....	
		.....

[4]

[Total : 11]

- 3 A student was provided with five Petri dishes labelled **S1** to **S5**. Each contained a different concentration of sucrose solution. They were also provided with 10 potato strips, each exactly 50 mm long.

For  
Examiner's  
Use

Two strips of potato were placed in each solution and left for thirty minutes.

Then the strips were removed and blotted carefully.

Their lengths were re-measured and recorded in Table 3.1.

- (a) (i) Complete Table 3.1.

**Table 3.1**

	S1	S2	S3	S4	S5
original length of strips / mm	50	50	50	50	50
length of strip 1 after immersion in sucrose solution / mm	51	50	48	50	49
length of strip 2 after immersion in sucrose solution / mm	50	46	47	53	49
mean length of potato strips after immersion / mm		48		51.5	49
change in mean length of potato strips / mm		-2		1.5	-1

[4]

- (ii) The concentration of sucrose in each of the five different solutions is given in Table 3.2.

Use the results in Table 3.1, to work out which solution was in which labelled Petri dish.

Enter **S1**, **S2**, **S3**, **S4** and **S5** in the appropriate order in right hand column of Table 3.2.

**Table 3.2**

sucrose solution concentration / mol dm <sup>-3</sup>	Petri dish
1.0	
0.8	
0.6	
0.4	
0.2	

[4]

(b) State **two** ways in which this experiment could be improved to make the results more reliable.

For  
Examiner's  
Use

.....

.....

.....

..... [2]

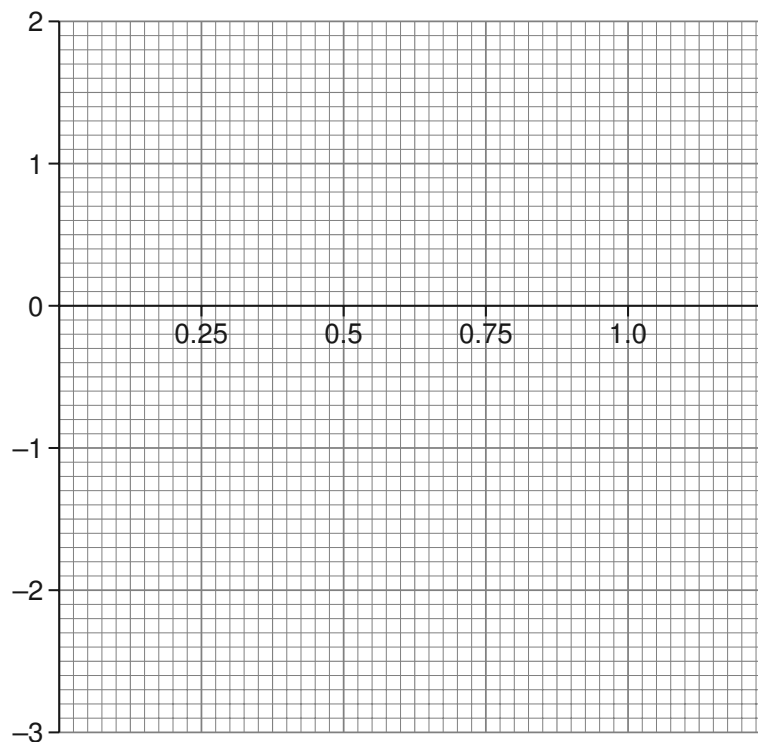
(c) Another student carried out a similar experiment and obtained the following results.

**Table 3.3**

sucrose solution concentration / mol dm <sup>-3</sup>	change in mean length / mm
1.0	-1.9
0.75	-1.2
0.5	-0.5
0.25	+0.3
0.0	+1.0

For  
Examiner's  
Use

(i) On the grid, draw a graph of the change in mean length against the concentration of sucrose solution using the data in Table 3.3 and draw a line of best fit.



[4]

(ii) State sucrose concentration when there is no change in length of the potato strips, using information from your graph.

..... [1]

[Total : 15]

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 University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.