

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

**Advanced GCE**

**BIOLOGY**

**2806/03/TEST**

Practical Examination (Part B): Practical Test

Friday **25 JANUARY 2002** Afternoon 1 hour 30 minutes

Candidates answer on the question paper

Additional materials:

Electronic calculator

Candidate's Plan (Part A of the Practical Examination)

Candidate Name	Centre Number	Candidate Number										
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**TIME** 1 hour 30 minutes

**INSTRUCTIONS TO CANDIDATES**

- Write your name in the space above.
- Write your Centre number and Candidate number in the boxes above.
- Answer **all** questions.
- Write your answers in the spaces on the question paper.
- Read each question carefully and make sure you know what you have to do before starting your answer.

**INFORMATION FOR CANDIDATES**

- In this Practical Test, you will be assessed on the Experimental and Investigative Skills:
  - Skill I Implementing
  - Skill A Analysing evidence and drawing conclusions
  - Skill E Evaluating
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.

<b>FOR EXAMINER'S USE</b>		
Qu.	Max.	Mark
<b>Planning</b>	<b>16</b>	
<b>1</b>	<b>29</b>	
<b>2</b>	<b>15</b>	
<b>TOTAL</b>	<b>60</b>	

**This question paper consists of 6 printed pages, 1 blank page and a Report Form.**

**Question 1** [55 minutes]

You are required to investigate the effects of samples of leaf extract containing intact chloroplasts on the dye DCPIP. The leaf extract was prepared as follows. Fresh, green leaves were homogenised with chilled buffer solution containing sucrose in a food mixer. The mixture was filtered through several layers of muslin and subsequently maintained at a low temperature.

*DCPIP is blue when oxidised and colourless when reduced.*

*Proceed as follows:*

Place the following in a test-tube in this order: **4 cm<sup>3</sup>** of buffer solution, **1 cm<sup>3</sup>** of DCPIP solution and **0.5 cm<sup>3</sup>** of leaf extract.

Shake the tube gently to mix the contents.

Place the tube in a rack about 10 cm from the bulb of a bench lamp.

Turn on the lamp and start timing.

Observe the tube over the next 5 minutes or so.

During this time continue with the question.

- (a) (i) Record any changes that you observed in the contents of the tube and the length of time that elapsed before an obvious change occurred in the contents.

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Carry out a further procedure that will establish if the changes that you recorded in (a)(i) were due to the presence of the leaf extract.

- (ii) Describe your methods, state the results you obtained and explain how the results provide evidence about the involvement of the leaf extract.

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Plan and carry out further procedures to determine if the changes that you observed in (a)(i) occur **1** in the dark and **2** using leaf extract that has been boiled for **1 minute** and then cooled.

(b) Briefly record your method, results and conclusions.

1 .....  
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2 .....  
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(c) State **two** aspects of the procedure that you carried out in (b) that allowed you to make valid comparisons with the results you obtained in (a).

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(d) Use your biological knowledge and your observations in (a) and (b) to explain the effects of the leaf extract on DCPIP solution.

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The solution which was used to make the leaf extract has a pH of 6.5 and contains sucrose.

(e) State why each of these is a requirement of this particular solution.

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- (f) State **two** factors, other than light intensity, which might affect the rate of the reaction of leaf extract on DCPIP.

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In a class experiment a student used reaction mixtures such as you used in (a) to record the time taken for complete reduction of the DCPIP to occur at different light intensities.

The results are shown in the table.

light intensity/lux	200	400	600	800	1000	1200
time for reduction of DCPIP/min	43	31	20	14	13	26

- (g) (i) Describe a procedure that would allow you to be certain that complete reduction of the DCPIP had occurred.

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- (ii) Describe and explain the data in the table.

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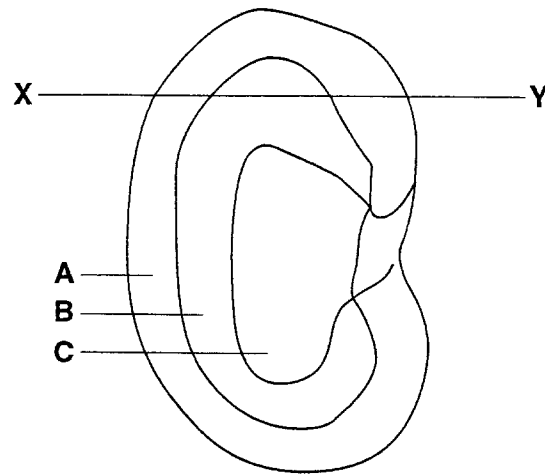
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[Total: 29]

**Question 2** [35 minutes]

**K1** is a stained section of a mammalian kidney. A number of different regions make up this section. These are shown in **Fig. 2.1**.



**Fig. 2.1**

Examine **K1** carefully using low and high power objectives of your microscope.

- (a) (i) Regions **A** and **B** show kidney tubules cut in different planes.

Make drawings of **two** tubules in region **A** which are cut in different planes.

Do **not** draw individual cells.

- (ii) Describe how most of the tubules are orientated in region **B**.

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- (iii) State the part of the nephron mainly found in region **B**.

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(iv) State **two** ways in which the tubules differ in regions **B** and **C**.

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(v) Name the structures that are visible in region **A** but **not** in **B** or **C**.

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**K2** is also a stained section of a mammalian kidney. It has been cut along the plane shown by the line **X-Y** in Fig. 2.1.

(b) (i) State **two** features of this section that indicate that it has been cut along this plane.

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(ii) Make a high power drawing to show the structure of **one** typical tubule that occurs in the central region of **K2**. No labels are required.

[Total: 15]