

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**BIOLOGY**

Paper 3 Practical Test



**5090/03**

May/June 2005

**1 hour 15 minutes**

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 on all work you hand in.  
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 **both** 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                  |  |
| <b>Total</b>       |  |

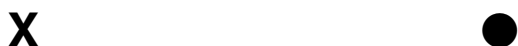


1 You are going to carry out three investigations into how the eye works.

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

- (a) ● With your left hand cover your left eye.
- 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 that 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) Make a large labelled drawing of your left eye, as it appears in the mirror provided.

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Use

[7]

- (ii) ● Hold the mirror in one hand.
- Close both of your eyes and cover them with your other hand.
  - Count slowly to sixty.
  - Quickly remove your hand, open your eyes and look at your iris and pupil in the mirror.

(This may take some practice and need to be repeated.)

Make drawings of the iris and pupil of one eye, as they appeared when the eye was first uncovered and about one minute later.

|   |  |
|---|--|
| Appearance of iris and pupil<br>when first uncovered. | Appearance of iris and pupil<br>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.

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Use*

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.....

.....

.....

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.....

.....

..... [6]

[Total : 19]

2 You are provided with two large labelled test-tubes, stoppered with cotton wool, containing alcohol.

**Alcohol is highly flammable. Do not remove the cotton wool until you are ready to use the alcohol.**

You are also provided with two green leaves, labelled **S1** and **S2**, both of which have been kept in the light for 48 hours.

One leaf has been kept in an atmosphere without carbon dioxide. The other leaf has been kept in a normal atmosphere.

Prepare each leaf for testing for the presence of starch by using the following procedure.

- Read right through this procedure.
- When you are ready to start, raise your hand and the supervisor will bring you very hot water to put in the beaker.
- Using forceps, dip **S1** into this hot water for a few seconds.
- Take the leaf from the hot water and place it in the alcohol in the test-tube labelled **Tube 1**.
- Repeat the procedure for **S2** using the test-tube labelled **Tube 2**.
- Put the test-tubes of alcohol with the leaves inside into the hot water, for approximately five minutes.
- Prepare the white tile by labelling one half **S1** and the other half **S2**.
- Remove the leaf **S1** from the alcohol.
- Dip the leaf briefly in the hot water and then place it on the white tile.
- Remove the leaf **S2** from the alcohol.
- Dip the leaf in the hot water and place on the tile.
- Test the leaves for starch.

(a) (i) Suggest why the leaves were placed in the hot water at the beginning of the procedure.

.....  
..... [1]

(ii) Suggest why the leaves were heated in alcohol.

.....  
.....  
..... [2]

(iii) Describe the effect of dipping the leaves into hot water after removing them from the alcohol.

.....  
..... [1]

(iv) Describe how you completed the test for starch after you removed the leaves from the hot water.

.....  
.....  
..... [2]

(v) Complete Table 2.1.

**Table 2.1**

| leaf      | starch test |            |
|-----------|-------------|------------|
|           | observation | conclusion |
| <b>S1</b> | .....       | .....      |
|           | .....       | .....      |
| <b>S2</b> | .....       | .....      |
|           | .....       | .....      |

[2]

(vi) Using your knowledge of photosynthesis, state which leaf had been kept in an atmosphere without carbon dioxide and explain how you came to this conclusion.

leaf .....

explanation .....

.....  
..... [2]

(b) A student carried out an experiment to investigate whether the amount of starch produced by leaves was affected by the carbon dioxide concentration in the surrounding atmosphere.

The results of the experiment are given in Table 2.2.

One reading has been omitted.

(i) Estimate the value of the missing entry and complete the table.

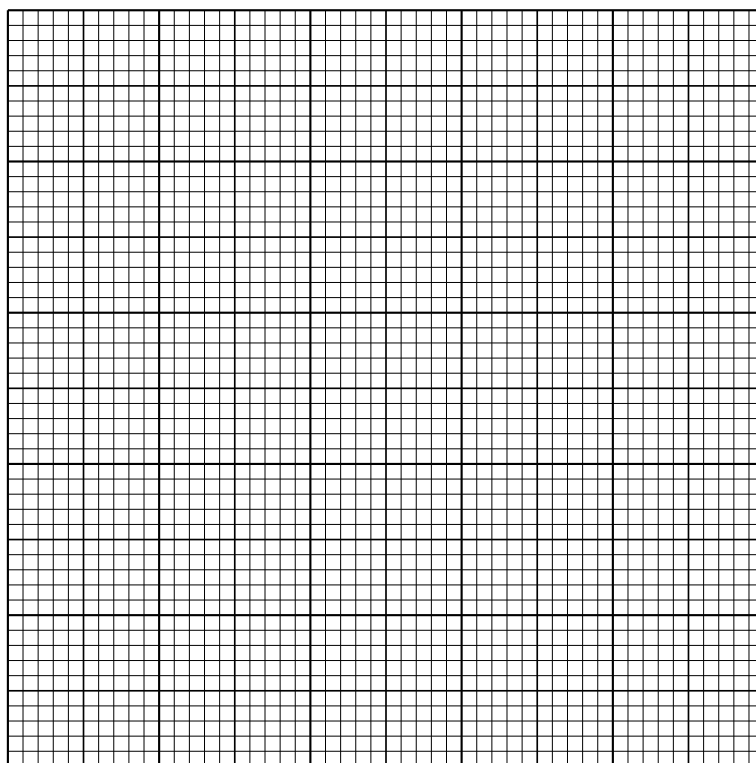
Table 2.2

For  
Examiner's  
Use

| concentration of carbon dioxide / arbitrary units | rate of starch production / arbitrary units |
|---|---|
| 0.0   | 0   |
| 1.0   | 11  |
| 2.0   | 19  |
| 3.0   | 32  |
| 4.0   |   |
| 5.0   | 33  |
| 6.5   | 32  |
| 7.0   | 33  |

[1]

- (ii) On the grid below, construct a graph to show the relationship between carbon dioxide concentration and the rate of starch production.



[5]

