| Centre Number | Candidate Number |
|---|---|
| | |

Candidate Name _____

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**General Certificate of Education Advanced Level**

# BIOLOGY 9700/5

PAPER 5 Practical Test A2

**MAY/JUNE SESSION 2002**

1 hour 30 minutes

Candidates answer on the question paper.
Additional materials:
As listed in Instructions to Supervisors

**TIME** 1 hour 30 minutes

**INSTRUCTIONS TO CANDIDATES**

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

Answer **both** questions.

Write your answers in the spaces provided on the question paper.

**INFORMATION FOR CANDIDATES**

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

You are advised to spend 50 minutes on Question 1 and 40 minutes on Question 2.

| FOR EXAMINER'S USE | |
|---|---|
| 1 | |
| 2 | |
| TOTAL | |

**This question paper consists of 5 printed pages, 2 blank pages and a Report Form.**




UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate

[Turn over

**Question 1** [50 minutes]

**(a)** **K1 and K2** are stained, transverse sections of leaves from two different species of plant.

**(i)** Make a large, labelled, plan drawing of **K1** to show the distribution of tissues in the leaf lamina (avoiding the midrib). Details of individual cells are **not** required.

[4]

**(ii)** Make a labelled, high-power drawing to show the detailed structure of **three** adjacent cells from the palisade mesophyll layer.

[4]

**(b)** The plant species from which **K2** was taken grows in a dry habitat.

**(i)** Examine **K2**, using your microscope.

State four observable features that distinguish **K2** from **K1** and relate each feature to its function.

*feature 1* .....

*function* .....

.....

*feature 2* .....

*function* .....

.....

*feature 3* .....

*function* .....

.....

*feature 4* .....

*function* .....

.....[8]

**(ii)** With reference to photosynthesis, state **one** disadvantage to the plant of having a leaf form like the one in **K2**.

.....

.....[1]

[Total : 17]



**[Turn over**

**Question 2** [40 minutes]

You are required to design an experiment to test the effect of light intensity on photosynthesis.

The apparatus that you may use in your design is shown in Fig. 2.1.

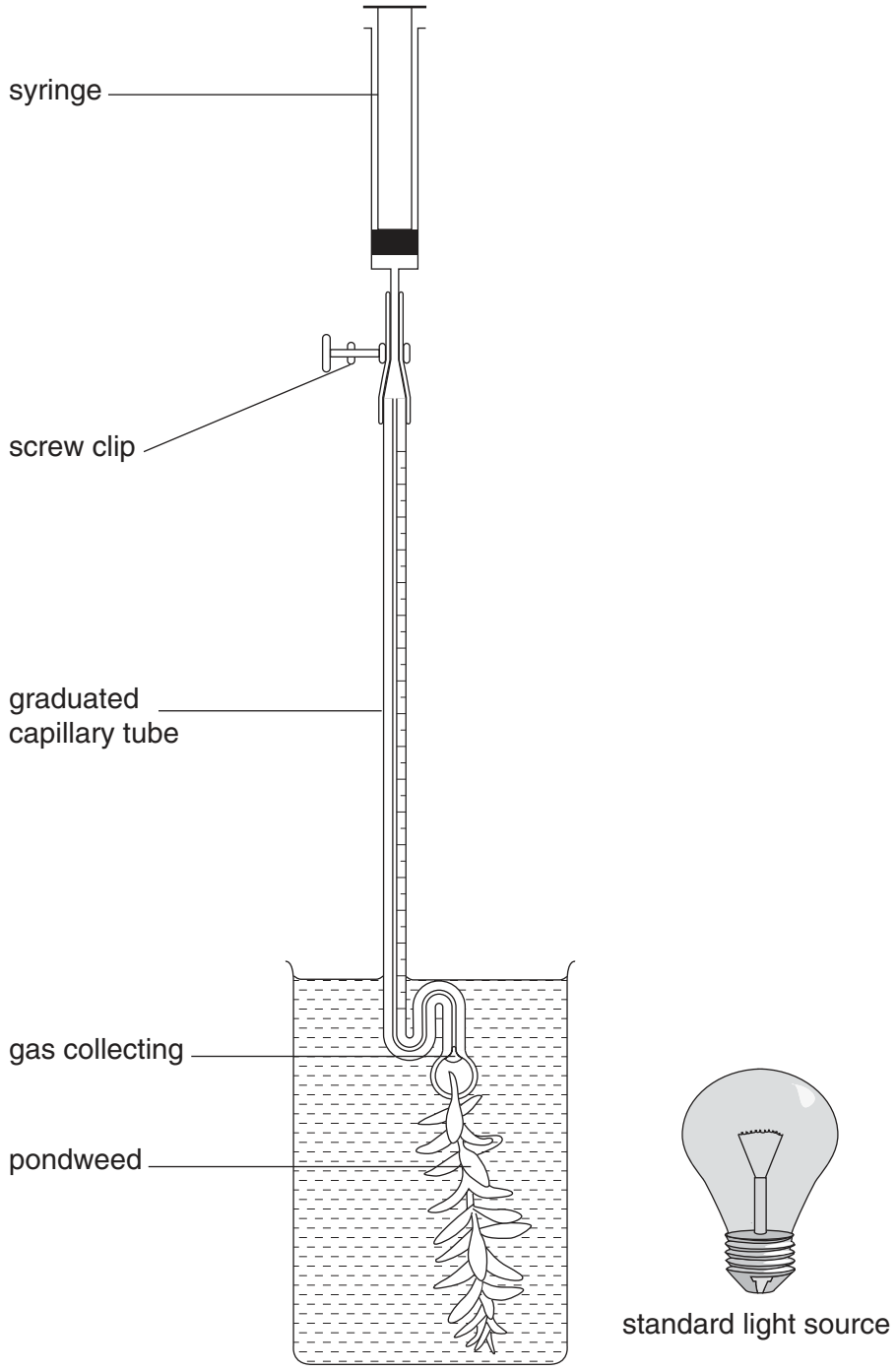


**Fig. 2.1**

- The pondweed releases bubbles of gas from a freshly cut stem when illuminated.
- When the light source is moved closer to the pondweed, the intensity of the light increases with the inverse square law. This means that if you half the distance between the light source and the pondweed, the intensity of the light increases four-fold.

**(a)** Describe how you would set up and use this apparatus, indicating the measurements you would take.

*set up* .....

.....

.....

*use* .....

.....

.....

*measurements* .....

.....

.....[7]

**(b)** State which variables you would need to control, in order to ensure that the results you obtained were reliable.

.....

.....

.....

.....[2]

**(c)** A group of students carried out this experiment and obtained the following results.

| lamp distance from pondweed / cm | 80 | 60 | 40 | 20 | 10 |
|---|---|---|---|---|---|
| bubbling rate / arbitrary units | 2 | 4 | 8 | 32 | 32 |

Explain this relationship between the light intensity and gas production.

.....

.....

.....

.....

.....

.....[4]

[Total : 13]

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## REPORT FORM

**The teacher responsible for this subject is asked to answer the following questions.**

**(a)** Was the candidate physically handicapped in drawing or in using a microscope or is the candidate colour-blind? If so, give brief details.

**(b)** Was the candidate handicapped by deficient material or apparatus? If so, give brief details.

**(c)** Was it necessary to make any substitutions for the materials sent from Cambridge? If so, give brief details of the circumstances.

**(d)** Any comments.

Signed ……

N.B. *Information that applies to all candidates need only be given on the first candidate's answer book.*