

Candidate Name \_\_\_\_\_

Centre Number	Candidate Number

**International General Certificate of Secondary Education**  
**UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE**  
**BIOLOGY**  
**PAPER 3**  
**MAY/JUNE SESSION 2000**

**0610/3**

1 hour 15 minutes

Additional materials:  
Answer paper

**TIME** 1 hour 15 minutes

**INSTRUCTIONS TO CANDIDATES**

Write your name, Centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

**Section A**

Answer **all** questions.

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

**Section B**

Answer any **two** questions.

Write your answers on the separate answer paper provided.

At the end of the examination,

1. fasten the separate answer paper securely to the question paper;
2. enter the numbers of the Section B questions you have answered in the grid below.

**INFORMATION FOR CANDIDATES**

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

You are advised to spend no longer than 30 minutes on Section A.

FOR EXAMINER'S USE	
Section A	
Section B	
<b>TOTAL</b>	

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**This question paper consists of 7 printed pages and 1 blank page.**

**Section A**

Answer **all** questions in this section.

- 1 South Uist is a small island which provides one of the few remaining summer habitats for a bird called the Corncrake (*Crex crex*). It lives in hay fields where it feeds on insects, worms and seeds. South Uist provides a good habitat because there are plenty of hay fields where the Corncrake can nest and there are few predators.

However, a small mammal called the Hedgehog (*Erinaceus europaeus*) was released onto the island. The Hedgehog also has few natural predators and will feed on the eggs of Corncrakes, as well as on insects and worms. The number of Hedgehogs on South Uist has risen rapidly to 10 000 while Corncrakes are becoming endangered as their numbers worldwide are falling.

- (a) (i) State **two** features which birds and mammals have in common.

- 1. ....
- 2. ....

- (ii) State **two** features which distinguish birds from mammals.

- 1. ....
- 2. ....

[4]

- (b) Suggest why isolated islands such as South Uist are more easily colonised by birds than mammals.

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

- (c) State **three** reasons why South Uist provides a good habitat for Corncrakes.

- 1. ....
- 2. ....
- 3. ....[3]

- (d) Explain why Corncrakes are becoming endangered by Hedgehogs.

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

(e) Draw a food web to show the feeding relationships described in the passage. Assume that insects and worms feed on leaves.

[4]

(f) Suggest **two** ways by which the extinction of the Corncrake may be prevented.

1. ....  
.....

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

[Total : 16]

2 Fig. 2.1 shows part of the lower surface of a typical dicotyledonous leaf.

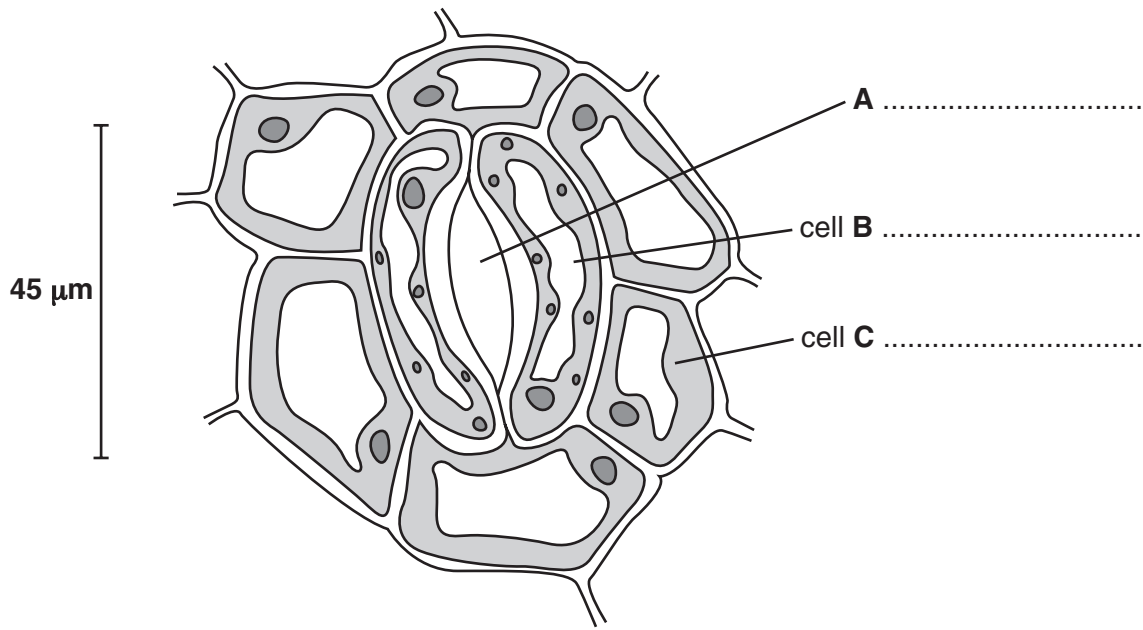


Fig. 2.1

(a) On Fig. 2.1, label part **A** and the cells **B** and **C**. [3]

The surfaces of the leaves of two species of plant were studied and the number of stomata per unit area (stomatal frequency) was recorded.

Cobalt chloride paper changes colour in the presence of water.

Pieces of cobalt chloride paper were attached to the upper and lower surfaces of leaves on both plants. The plants were set up for one hour during the day. Any colour changes were recorded. The experiment was repeated for one hour at night. Table 2.1 shows the results.

Table 2.1

plant species	stomatal frequency		colour change to cobalt chloride paper			
	lower surface	upper surface	day		night	
			lower surface	upper surface	lower surface	upper surface
<i>Cassia fistula</i>	0	18	x	✓	x	x
<i>Bauhinia monandra</i>	22	0	✓	x	x	x

**Key**  
 ✓ colour change  
 x no colour change

(b) Describe the differences in stomatal distribution between the two species of plant.

.....

.....

.....[2]

**(c) (i)** Explain the colour changes to the cobalt chloride paper during the day.

.....  
.....  
.....[3]

**(ii)** Suggest why there was no colour change for either plant at night.

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

**(d)** Outline the mechanism by which water in the roots reaches the leaf.

.....  
.....  
.....  
.....[3]

**(e)** State and explain the effect of the following on transpiration rate:

**(i)** increasing humidity;

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

**(ii)** increasing temperature.

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

[Total : 16]

**3** Cystic fibrosis is an inherited disorder in humans in which an important protein is not produced. This protein is responsible for preventing the accumulation of thick and sticky mucus in the breathing tubes. The allele which causes cystic fibrosis is recessive to the normal allele (F).

**(a)** State the genotype of

**(i)** a carrier of cystic fibrosis; .....[1]

**(ii)** a sufferer of cystic fibrosis. ....[1]

**(b)** Draw a genetic diagram to show if it is possible for a man with a dominant pair of alleles and a woman who is a carrier to produce a baby with cystic fibrosis. Identify the phenotypes of the children.

[4]

**(c)** Suggest how the build up of sticky mucus would affect a sufferer of cystic fibrosis.

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

[Total : 8]

**Section B**

Answer any **two** questions in this section on separate answer paper.

- 4 (a) Describe the functions of each of the following parts of the heart:
- (i) right atrium;
  - (ii) right ventricle;
  - (iii) tricuspid valve.
- [9]
- (b) Outline the likely causes of a heart attack and suggest what preventive measures can be taken to maintain a healthy heart. [6]
- 5 (a) (i) Define the term *reflex action*. [3]
- (ii) Describe the pupil reflex and explain its advantages. [5]
- (b) Distinguish between rods and cones in terms of function and distribution. [4]
- (c) Suggest how damage to **three named** parts of the eye could result in impaired vision or blindness. [3]
- 6 (a) Describe and explain the possible effects of allowing untreated sewage to enter a small lake. [5]
- (b) Outline a treatment of sewage which would produce re-usable water. [6]
- (c) Describe how a plant living in a dry habitat is adapted to conserve water. [4]
- 7 (a) Distinguish between *excretion* and *egestion*. [4]
- (b) Describe the passage of water from blood in the aorta to its excretion via the urethra. Illustrate your answer with the aid of a simple, labelled diagram. [7]
- (c) Outline the role of the liver in excretion. [4]

