

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

Centre Number

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**International General Certificate of Secondary Education**  
**CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
**BIOLOGY**  
**PAPER 3**

**0610/3**

**OCTOBER/NOVEMBER SESSION 2002**

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 any separate answer paper used 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 intended 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>	

**This question paper consists of 8 printed pages.**

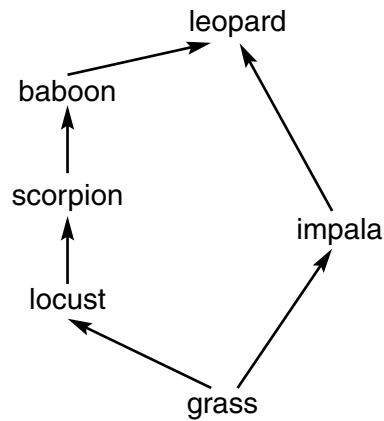


**Section A**

Answer **all** the questions.

Write your answers in the spaces provided.

- 1 Fig. 1.1 shows a food web in an ecosystem.



**Fig. 1.1**

- (a) Define the following terms:

- (i) *ecosystem*;

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

- (ii) *food web*.

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

- (b) (i) Name the herbivores shown in the food web.

.....[1]

- (ii) Suggest why it is difficult to state the trophic level to which the leopard belongs in this food web.

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

- (c) In some years, there are plagues of locusts.

State and explain the effect such a plague might have on numbers of

- (i) impala;

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

- (ii) scorpions.

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

- (d) During one locust plague, although the baboons had more food, their numbers subsequently dropped.

- (i) In terms of the food web, explain how this happened.

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

- (ii) Suggest another reason, **not** related to the food web or hunting, for the drop in baboon numbers.

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

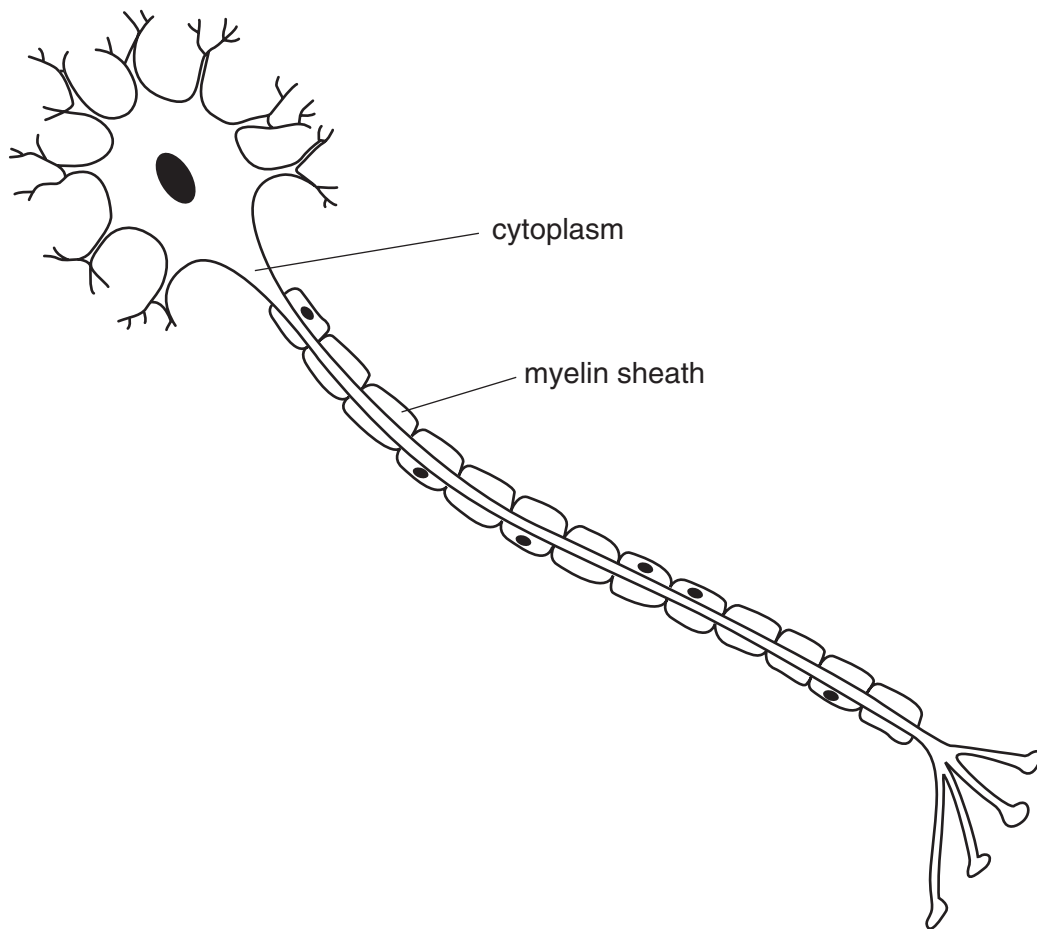
- (e) Leopards are sometimes hunted for their fur and other uses.

Suggest two reasons for banning the hunting of leopards.

1. ....  
 .....  
 2. ....  
 .....[2]

[Total : 12]

2 Fig. 2.1 shows a nerve cell.



**Fig. 2.1**

(a) (i) Name the type of nerve cell shown in Fig. 2.1.

.....[1]

(ii) State two features that distinguish it from other types of nerve cell.

1. ....

2. ....[2]

(iii) Where, in the nervous system, is this cell located?

.....[1]

**(b)** Nerve cells are specialised cells.

Suggest how the parts of the nerve cell labelled in Fig. 2.1 enable the nerve cell to function successfully.

*cytoplasm* .....

.....

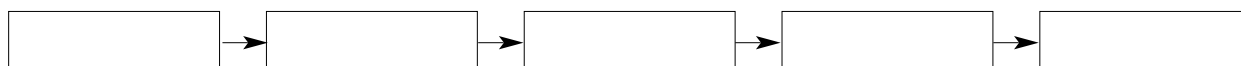
*myelin sheath* .....

.....[4]

**(c)** Reflexes involve a response to a stimulus.

- (i) Complete the flow chart by putting the following terms in the boxes to show the correct sequence in a reflex.

**coordinator      effector      receptor      response      stimulus**



[2]

- (ii) For the pupil reflex, identify each of the parts of the sequence by completing Table 2.1. The first has been done for you.

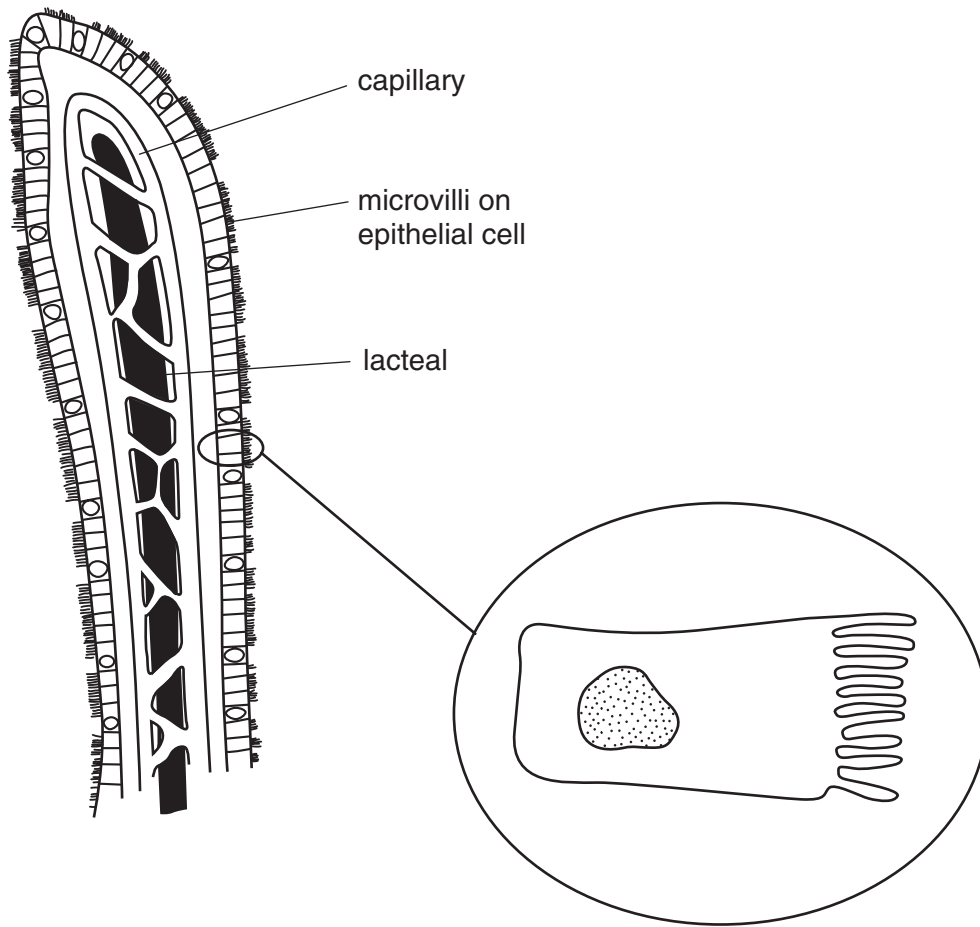
**Table 2.1**

part of sequence	part in pupil reflex
coordinator	brain
effector	
receptor	
response	
stimulus	

[4]

[Total : 14]

- 3 Fig. 3.1 shows part of a villus in the small intestine.



**Fig. 3.1**

- (a) (i) State the roles of the following structures in the villus:

*capillary*; .....

.....

*lacteal*. .....

.....[4]

- (ii) The epithelial cells, one of which is shown enlarged on Fig. 3.1, have microvilli on their exposed surface.

Suggest an advantage of these microvilli to the epithelial cells.

.....

.....[1]

- (b) (i) Name the process by which the products of digestion, present in high concentrations in the ileum, would pass into the capillaries.

.....[1]

- (ii) Describe how the capillaries are adapted to allow this process to happen efficiently.

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

- (c) Some substances are absorbed into the capillaries by active uptake.

- (i) Explain why active uptake is sometimes necessary.

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

- (ii) Suggest why active uptake stops when the epithelial cells of the ileum are exposed to a respiratory poison.

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

- (d) The lacteal, seen in the middle of the villus, is part of the lymphatic system.

State two functions of the lymphatic system, **not** associated with the ileum.

1. ....  
 2. .....[2]

[Total : 14]

## Section B

Answer any **two** questions.

Write your answers on the separate answer paper provided.

- 4 (a) Explain how auxins in a shoot that is placed horizontally change the direction of its growth. [5]
- (b) State the sites of production and describe the roles of oestrogen and progesterone
- (i) in the menstrual cycle; [6]
- (ii) during pregnancy. [4]

- 5 (a) Fig. 5.1 shows some of the features of a typical wind-pollinated flower.

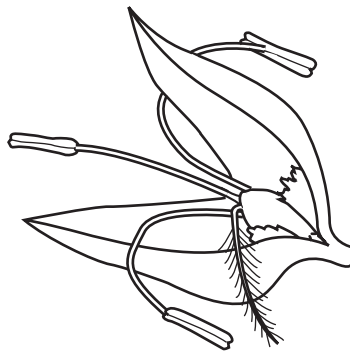


Fig. 5.1

- (i) Describe the features that make a typical wind-pollinated flower different from a typical insect-pollinated flower. [9]
- (ii) Suggest how pollen of a wind-pollinated flower would be different from that of an insect-pollinated flower. [3]
- (b) Outline the implications to a species of self-pollination. [3]
- 6 (a) Define the term *respiration*. [3]
- (b) By means of a table, distinguish between aerobic respiration and anaerobic respiration. [5]
- (c) Explain how a mammal regulates its body temperature after a period of strenuous exercise. [7]
- 7 (a) Distinguish between each of the following pairs of terms:
- (i) phenotype and genotype;
- (ii) dominant and recessive;
- (iii) homozygous and heterozygous. [7]
- (b) Using a suitable **named** example, explain how the following phenotypic ratios can be obtained from a genetic cross.
- (i) 1 : 1
- (ii) 3 : 1 [8]