

Candidate Name _____



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	
TOTAL	

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.

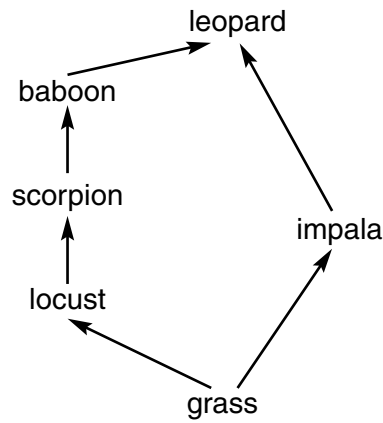


Fig. 1.1

(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.

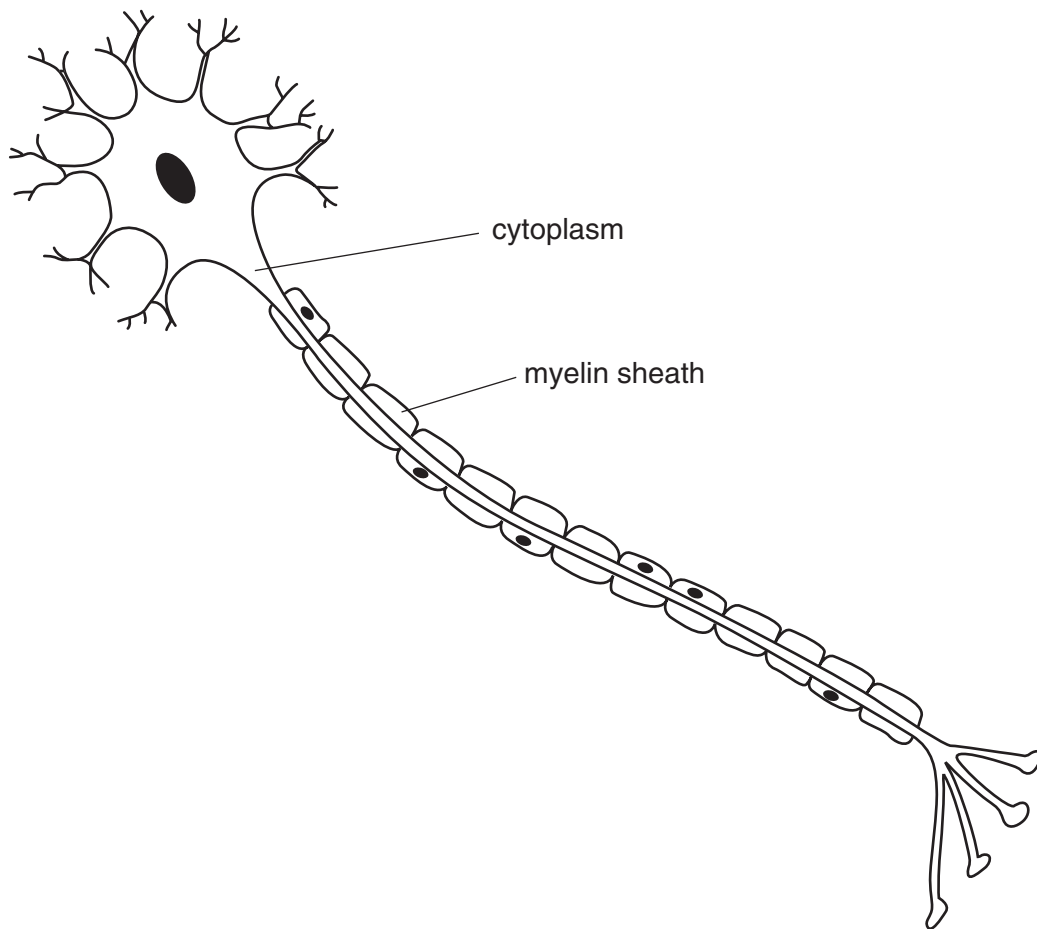


Fig. 2.1

(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.

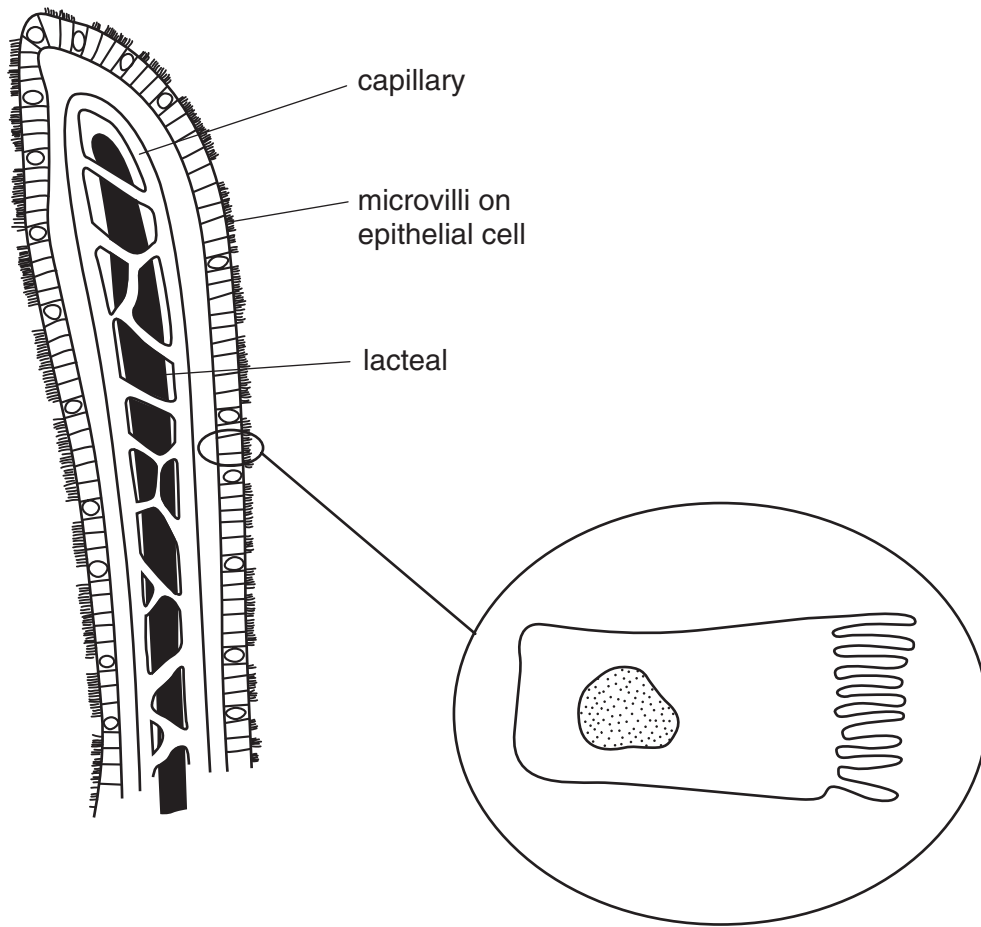


Fig. 3.1

(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.

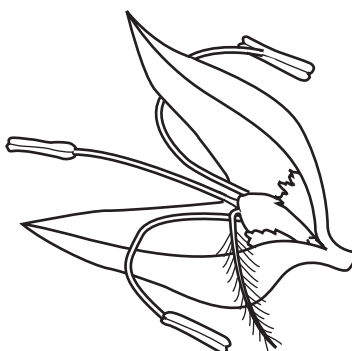


Fig. 5.1

- (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]