UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

9476785025

BIOLOGY **5090/02**

Paper 2 Theory **May/June 2008**

1 hour 45 minutes

Candidates answer Section A on the Question Paper.
Additional Materials: Answer Booklet/Paper

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Section A
Answer **all** questions.
Write your answers in the spaces provided on the Question Paper.
Section B
Answer **all** the questions including questions 6, 7 and 8 **Either** or 8 **Or**.
Write your answers on the separate Answer Paper provided.
Write an **E** (for Either) or an **O** (for Or) next to the number 8 in the examiner's grid below to indicate which question you have answered.

You are advised to spend no longer than one hour on Section A and no longer than 45 minutes on Section B.
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
Section A	
Section B	
6	
7	
8	
Total	

This document consists of **11** printed pages and **1** blank page.

Section A

For Examiner's Use

Answer **all** the questions in this section.

Write your answers in the spaces provided.

1 Fig. 1.1a shows the absorption and release of gases by an animal and by a leaf of a plant during the day.

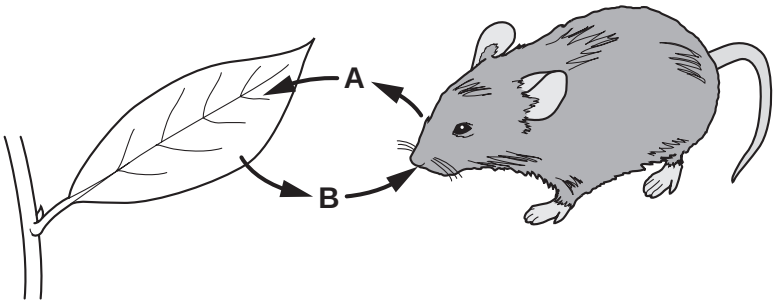

Fig. 1.1a

(a) Name

(i) gas **A**, ...

(ii) gas **B**. ..... [2]

(iii) On Fig. 1.1b, place arrow heads on the **four** lines to indicate the movement of the same gases during the hours of darkness. [3]

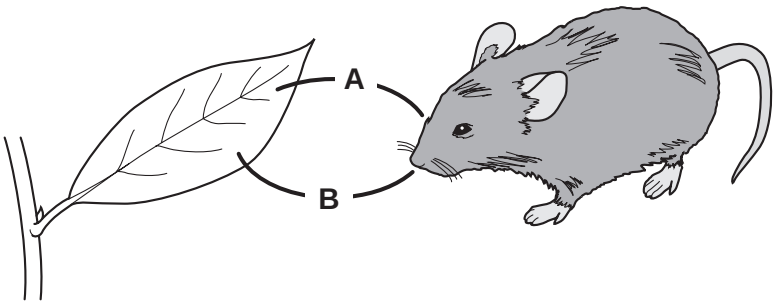

Fig. 1.1b

(b) Explain why, in the early morning and in the evening, there is no overall movement of gases into or out of the leaf.

For Examiner's Use

.....

.....

.....

..... [3]

(c) The animal eats the leaf.

Name a chemical substance in the leaf that

(i) will provide the animal with energy,

.....

(ii) the animal will use for growth.

.....

[2]

[Total: 10]

2 Fig. 2.1 shows a cheek cell from the lining of a person's mouth.

For Examiner's Use

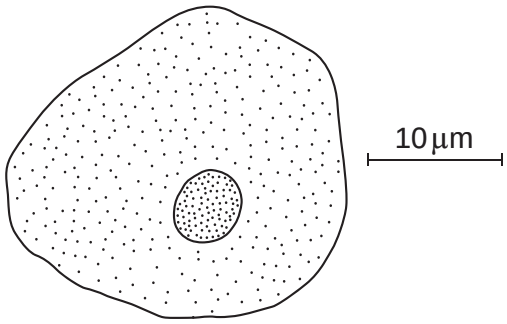

Fig. 2.1

(a) Name the chemical found in the nucleus that controls the production of protein.

..... [1]

Fig. 2.2 shows a gamete from the same person.

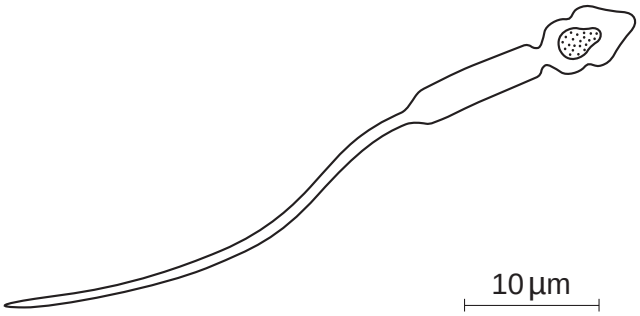

Fig. 2.2

(b) Describe how and explain why the two cells differ in appearance.

.....

.....

.....

.....

..... [4]

(c) **(i)** State two ways in which the nucleus of the gamete differs from the nucleus of the cheek cell.

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1. .....

2. ..... [2]

(ii) Explain why it is important that the two nuclei are different.

.....

.....

.....

..... [3]

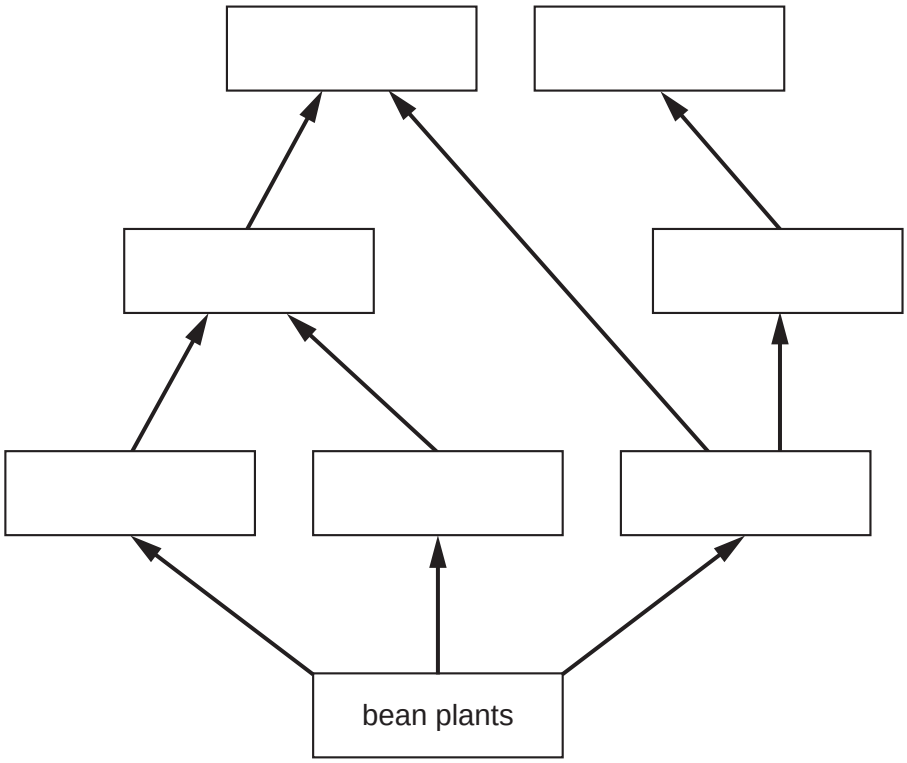
[Total: 10]

3 Over a period of several months, a student recorded some activities of the wild life in a particular habitat. The following observations appeared in her notebook.

For Examiner's Use

1. *Young shoots of a crop of bean plants covered with greenflies (aphids) sucking food from the stems.*
2. *Saw a large bird (hawk), which usually catches mice, swoop to take a small yellow bird clinging to a bean stem. Noticed that these small birds often visit the bean field to eat some of the aphids or butterflies.*
3. *Flowers of beans being visited by many different species of butterfly.*
4. *Mice seen nibbling at some dispersed bean seeds.*
5. *Spider's web constructed between two bean plants with 5 large black flies caught in it. Rotting body of a mouse nearby attracting similar flies.*

(a) Complete Fig. 3.1 by filling in the names of the organisms to show the feeding relationships in this community.



[4]

Fig. 3.1

(b) (i) What name is given to a chart of feeding relationships as shown in Fig. 3.1?

.....

[1]

(ii) Name two top carnivores observed by the student.

1. .....

2. .....

[2]

(c) In each space below,

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(i) draw and label a pyramid of biomass for the hawks, mice and bean plants in this habitat,

[2]

(ii) draw and label a pyramid of numbers for a bean plant, small birds and aphids.

[2]

[Total: 11]

4 Fig. 4.1 shows diagrammatically the action of enzymes on two different food molecules.

For Examiner's Use

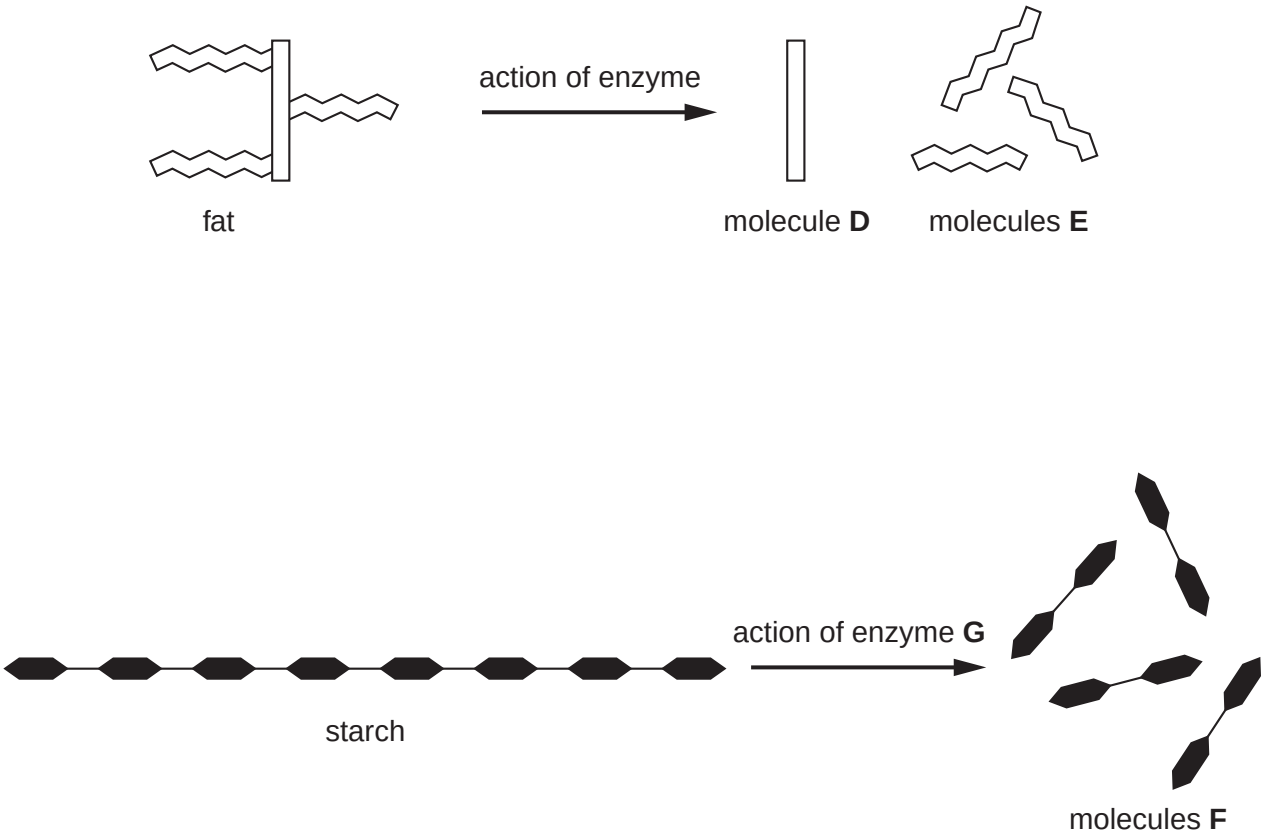

Fig. 4.1

(a) Identify the molecules shown in Fig. 4.1.

D .....

E .....

F ..... [3]

(b) Identify enzyme **G**. ..... [1]

(c) It has been found that fresh pineapple contains an enzyme that can be used to make meat more tender.

For Examiner's Use

(i) Explain why the pineapple is placed on the meat a few hours before, rather than during, cooking.

.....

.....

.....

..... [3]

(ii) Suggest the name of the enzyme and how it tenderises the meat.

.....

.....

.....

..... [3]

[Total: 10]

5 Fig. 5.1 shows a green plant (**H**) that is partially parasitic on its host plant.

For Examiner's Use

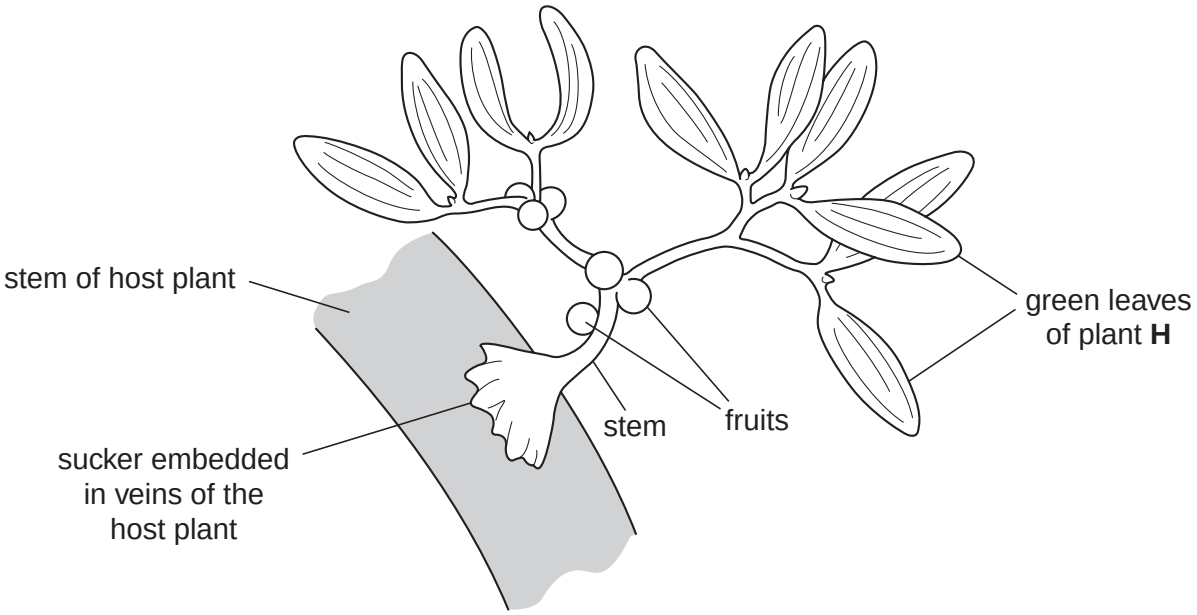

Fig. 5.1

(a) (i) Name an organ, found in free-living plants, that is absent in plant **H**.

..... [1]

(ii) Name the process used by plant **H** to manufacture its carbohydrates.

..... [1]

Plant **H** obtains one raw material for food manufacture from the air and other requirements, as well as nutrients, from its host.

(b) (i) Suggest three substances it absorbs from its host, and for each, state its use in Plant **H**.

substance 1 ....., use .....

substance 2 ....., use .....

substance 3 ....., use .....
[6]

(ii) Suggest the name of the tissue in the host plant which supplies these substances to plant **H**.

..... [1]

[Total: 9]

Section B

Answer **all** the questions including questions 6, 7 and 8 **Either** or 8 **Or**.

Write your answers on the separate answer paper provided.

6 Although skin is a waterproof structure, a few chemicals are able to pass through the tissues of the skin. When a person places a finger in a solution of one of these chemicals, it is possible for that chemical to enter the circulatory system and be carried to the tongue. The person then experiences the sensation of taste.

(a) Describe the pathway followed by this particular chemical from the finger until it reaches the tongue. [7]

(b) Describe the part played by the nervous system to enable the person to experience the sensation of taste. [3]

[Total: 10]

7 **(a)** State the functions in a flower of:

(i) sepals,

(ii) petals,

(iii) anthers,

(iv) carpels. [4]

(b) **(i)** Name a wind-pollinated plant.

(ii) Describe the anthers and the pollen of a typical wind-pollinated plant. [6]

[Total: 10]

Question 8 is in the form of an **Either/Or** question. Answer only question 8 **Either** or question 8 **Or**.

8 **Either** **(a)** List the main characteristics of

(i) viruses,

(ii) fungi. [7]

(b) Describe the role of bacteria in decomposition. [3]

[Total: 10]

8 **Or** Explain the advantages and disadvantages of the use of

(a) nitrogen-containing fertilisers, [5]

(b) insecticides. [5]

[Total: 10]

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