OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
Advanced GCE

BIOLOGY 2805/01

Growth, Development and Reproduction

Thursday **19 JUNE 2003** Afternoon 1 hour 30 minutes

Candidates answer on the question paper.
Additional materials:
Electronic calculator
Ruler (cm/mm)

Candidate Name	Centre Number	Candidate Number

TIME 1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

- Write your name in the space above.
- Write your Centre number and Candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers, in blue or black ink, in the spaces on the question paper.
- Read each question carefully before starting your answer.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.
- You will be awarded marks for the quality of written communication where this is indicated in the question.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.

FOR EXAMINER'S USE		
Qu.	Max.	Mark
1	14	
2	14	
3	14	
4	19	
5	13	
6	16	
TOTAL	90	

This question paper consists of 15 printed pages and 1 blank page.

Registered Charity Number: 1066969
[Turn over

Answer **all** the questions.

1 **(a)** **(i)** Explain what is meant by the term *endocrine gland.*

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(ii) Endocrine glands are controlled by negative feedback.

Explain the meaning of the term *negative feedback.*

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(b) **(i)** State **three** functions of the hormone thyroxine.

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(ii) Describe how the production of thyroxine is controlled.

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.....[6]

[Total: 14]

2 Some castor oil seeds were germinated. At daily intervals, a sample of these seeds was dried to determine the mean dry mass of whole seed, endosperm and embryo. The results are shown in Table 2.1.

Table 2.1

time from the start of germination / days	dry mass / mg g^{-1} whole seed	
	dry mass of endosperm	dry mass of embryo
0	150	1
1	126	2
2	125	3
3	103	3
4	77	10
5	56	9

(a) (i) Explain the advantage of determining dry mass rather than fresh (wet) mass.

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(ii) Describe, **giving practical details,** how you would obtain the data shown in Table 2.1.

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For Examiner's Use

(b) In this question, one mark is available for the quality of written communication.

Describe the changes occurring during germination which would account for the results shown in Table 2.1.

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Quality of Written Communication [1]

[Total: 14]

3 Fig. 3.1 is a longitudinal section of the male urinogenital system in humans.

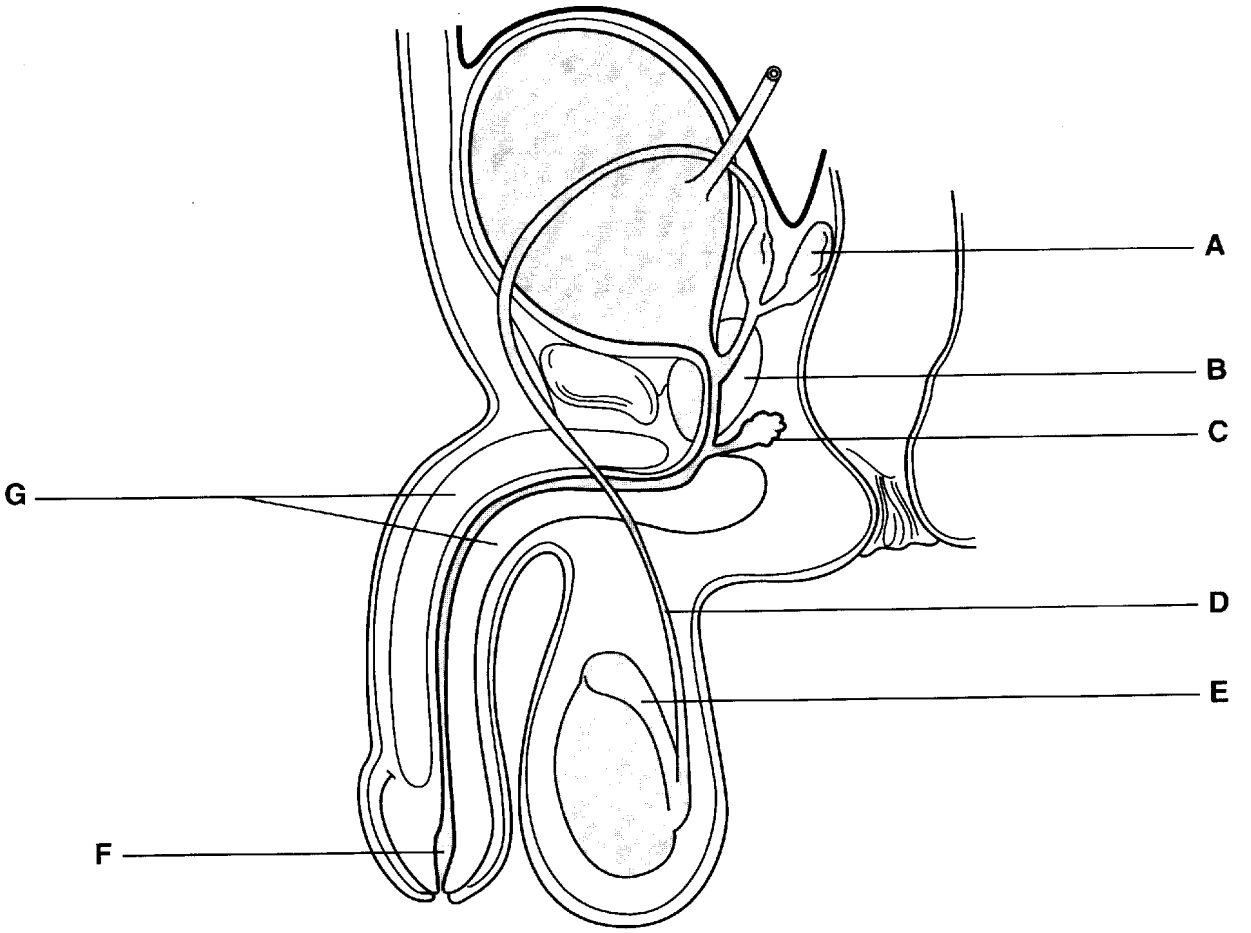

Fig. 3.1

(a) State which of the letters on Fig. 3.1 indicates

(i) the vas deferens; .....

(ii) the prostate gland; .....

(iii) the epididymis. ..... [3]

(b) Describe the function of the structure marked **G.**

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(c) State **two** main functions of the male gamete in humans.

1 .....

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2 .....

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(d) Complete the table below to compare fertilisation in humans with that in flowering plants.

	human	flowering plant
type of fertilisation	single	double
cell involved in nuclear fusion	oocyte	
	sperm	
site of fertilisation		
product(s) of fertilisation	zygote	
number of chromosome sets in the product(s) of fertilisation		

[7]

[Total: 14]

4 Most plants and animals are complex organisms with many cells. It is essential that information can be passed between these cells so that their activities can be coordinated.

Activity in plants is coordinated by plant growth regulators.

(a) (i) State **three** ways in which plant growth regulators are transported around a plant.

1 .....

2 .....

3 .....[3]

(ii) What are the advantages of seed dormancy to a flowering plant?

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(iii) Describe the role of gibberellins in breaking seed dormancy.

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(b) When a seed germinates, the embryo goes through a progressive series of changes, including the specialisation of cells.

Although the cells from the meristems are produced by mitosis, they develop to form a range of different specialised cells.

(i) Explain how cells with an identical genotype may become different specialised cells.

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(ii) Describe the series of changes in structure that would occur as a meristematic cell develops into **either** a xylem vessel element **or** a phloem sieve tube element.

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[Total: 19]

5 **(a)** Outline the changes that occur in the secretion of hormones during the menopause.

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(b) In this question, one mark is available for the quality of written communication.

Fig. 5.1 shows the relationship between age in women and the incidence of fractures of the radius and femur, as a percentage of women in each age group, over a five year period.

The results were collected before the roles of hormone replacement therapy (HRT) and dietary supplements, in reducing the incidence of bone fractures in post menopausal women, were recognised.

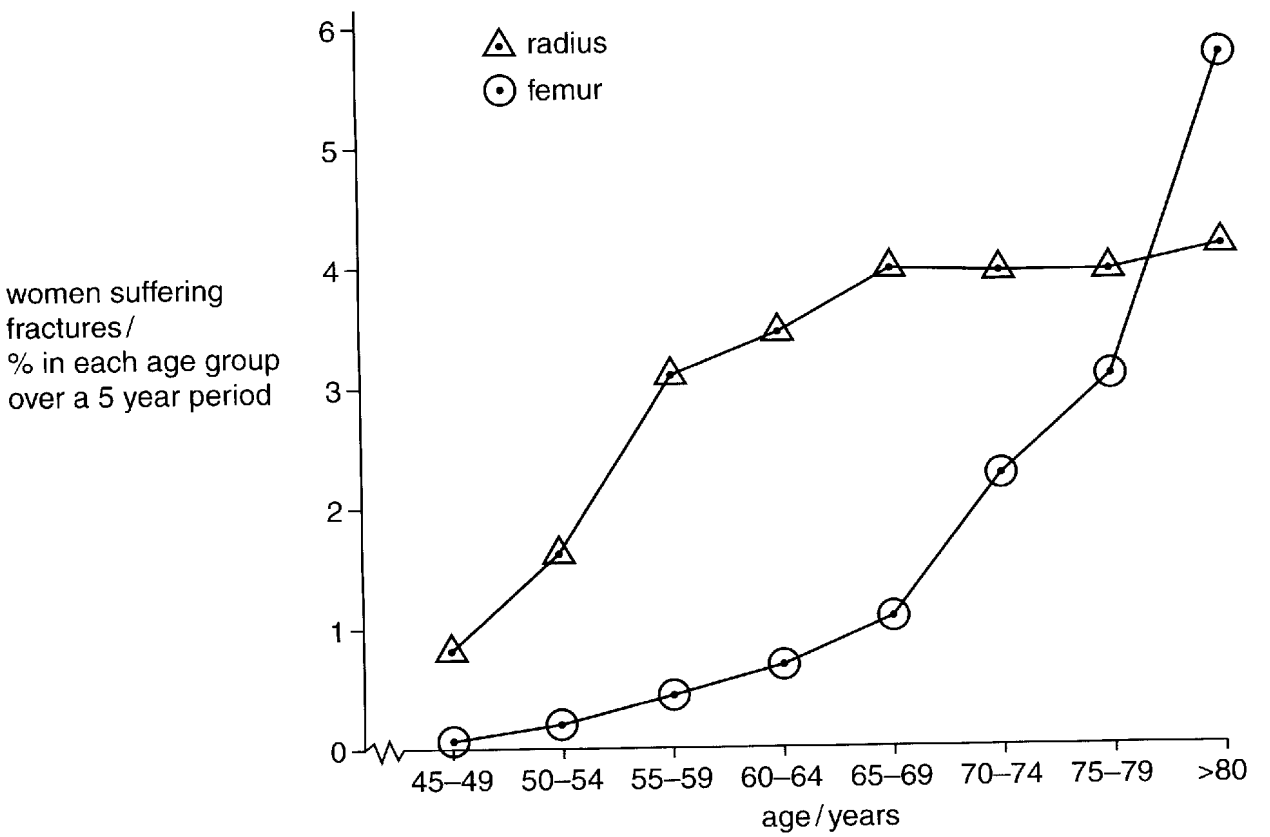

Fig. 5.1

Describe and explain the trends shown in Fig. 5.1 and suggest how the incidence of bone fractures in post menopausal women is being reduced.

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Quality of Written Communication [1]

[Total: 13]

6 Fig. 6.1 shows part of a flower of a grass.

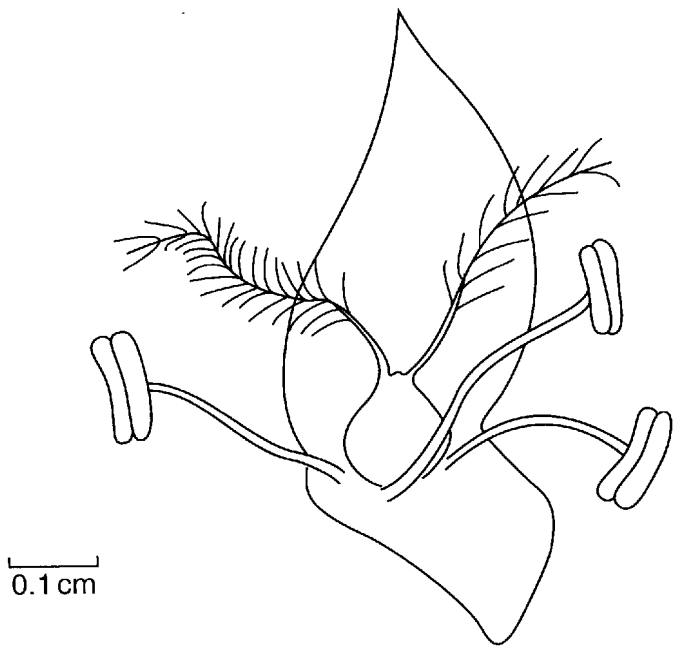

Fig. 6.1

(a) List the features **visible in Fig 6.1** that are adaptations for wind-pollination.

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(b) Fig. 6.2 shows a section of a pollen grain from an insect-pollinated flower.

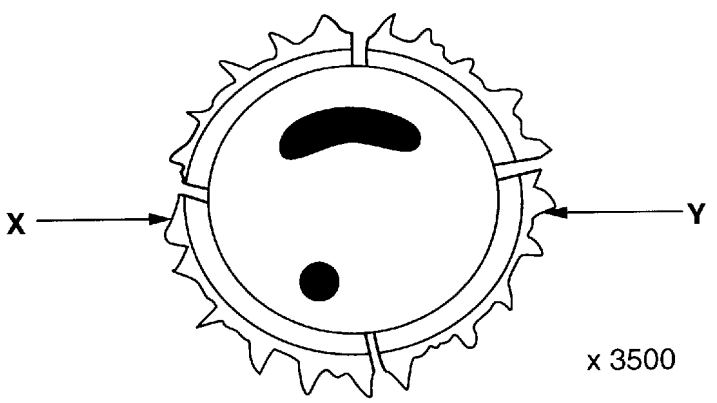

Fig. 6.2

(i) Calculate the actual diameter of the pollen grain, between points **X** and **Y** on Fig. 6.2. Show your working and give your answer in micrometres (μm).

Answer .....μm [2]

(ii) Describe how this pollen differs from the pollen of a grass.

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(c) Mitochondria are required for the production of pollen.

Outline the role of mitochondria in the production of a mature pollen grain.

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This question continues on page 14

(d) Suggest how different species of wind-pollinated plants maintain separate gene pools.

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(e) **(i)** Describe **two** methods by which **wind-pollinated** plants avoid **self**-pollination.

1. .....

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2. .....

.....[2]

(ii) Explain how self-pollination differs from asexual reproduction in flowering plants.

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[Total: 16]