

OXFORD CAMBRIDGE AND RSA EXAMINATIONS**Advanced GCE****BIOLOGY**

Growth, Development and Reproduction

2805/01Thursday **30 JANUARY 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												
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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	18	
2	12	
3	14	
4	16	
5	14	
6	16	
TOTAL	90	

This question paper consists of 16 printed pages and 4 blank pages.

(ii) Outline **two** advantages of producing genetically variable offspring.

1.

.....

2.

..... [2]

(iii) Explain why it is necessary to have a meiotic phase in the life cycle of all **sexually** reproducing species.

.....

.....

.....

..... [2]

(c) Freshly ejaculated sperm must undergo a process called capacitation before they can fertilise an oocyte.

Explain what happens during capacitation.

.....

.....

.....

.....

.....

..... [4]

[Total: 18]

- 2 Fig. 2.1 is a longitudinal section through the fertilised ovule of a flowering plant, to show the embryo.

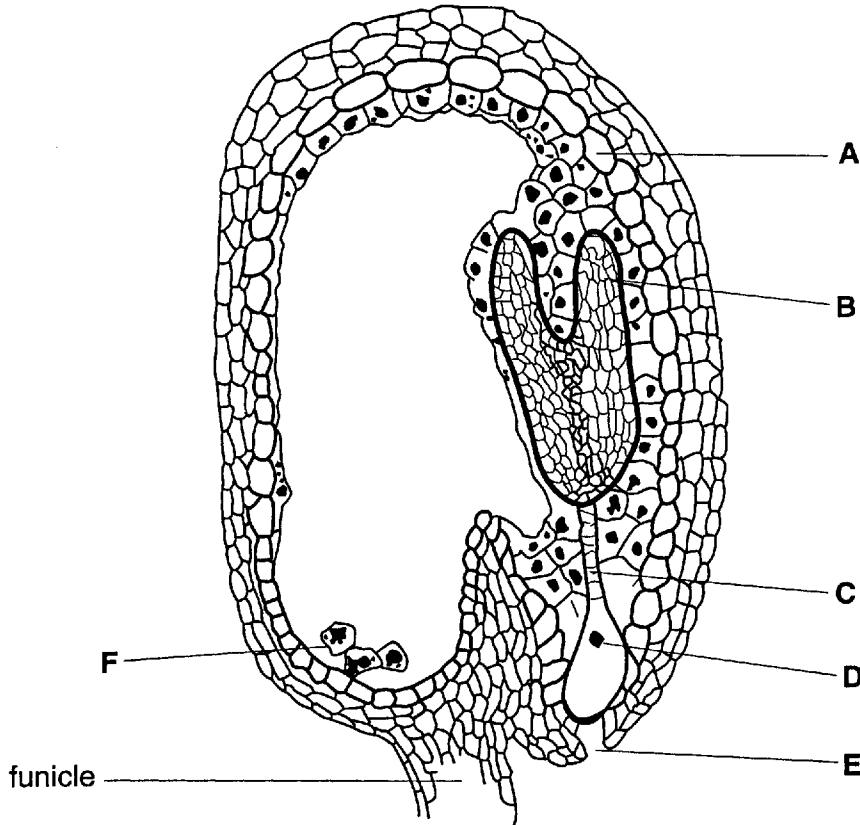


Fig. 2.1

(a) State which of the letters on Fig. 2.1 indicates,

(i) a cotyledon

(ii) the suspensor

(iii) an antipodal cell

[3]

- 3 (a) Fig. 3.1 shows the relative concentrations of oestrogen, progesterone, luteinising hormone (LH) and follicle stimulating hormone (FSH) in the blood of a non-pregnant female, during one menstrual cycle.

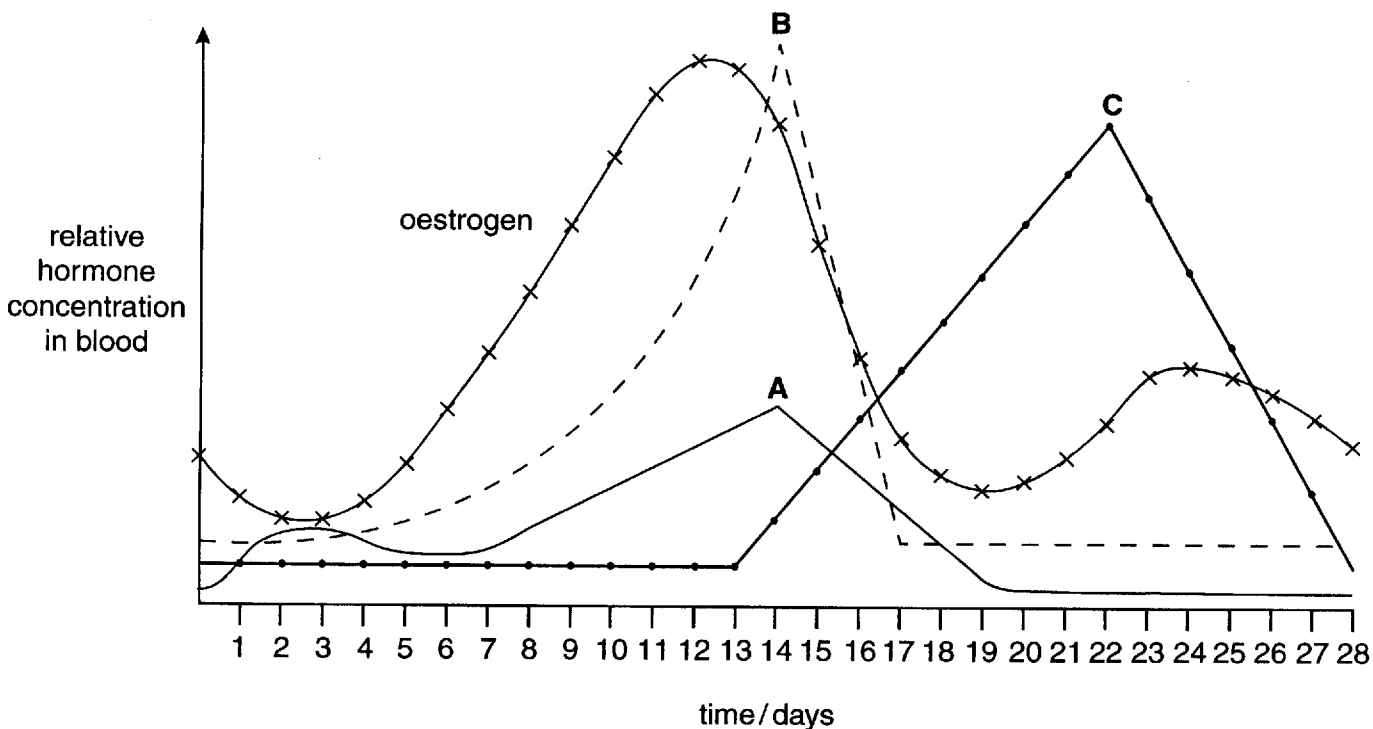


Fig. 3.1

Identify the hormones A to C and outline their functions in the menstrual cycle.

hormone A

functions

.....

.....

hormone B

functions

.....

.....

hormone C

functions

.....

..... [6]

- (b) 75% of adult patients admitted to hospital with asthma are women. The reason for this is not clear. Researchers have suggested that variations in oestrogen concentrations during the menstrual cycle may be a risk factor in the timing of asthma attacks in women. They collected data from 182 non-pregnant women under 47 years of age, who received treatment at casualty departments for acute asthma attacks. The data were collected over an eleven month period and are given in Table 3.1.

Table 3.1

phase of menstrual cycle / days	number of asthma attacks in group
5 – 11	36
12 – 18	43
19 – 25	18
26 – 4	85

- (i) Calculate the percentage of women who had an asthma attack between day 26 of one menstrual cycle and day 4 of the next. Show your working and give your answer to the nearest whole number.

Answer % [2]

- (ii) Describe the results shown in Table 3.1.

.....

.....

.....

..... [2]

- (iii) With reference to Fig. 3.1 and Table 3.1, discuss the evidence that supports the suggestion that variations in oestrogen concentration are a risk factor in the timing of acute asthma attacks.

.....

.....

.....

..... [2]

- (iv) The data shown in Table 3.1 were analysed using the χ^2 test and the probability of obtaining these results was <0.01 ($p < 0.01$).

Explain the meaning of this probability.

.....

.....

..... [2]

[Total: 14]

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PLEASE TURN OVER FOR QUESTION 4

(ii) State **two** sources of error when collecting data on the growth of a population of microorganisms.

1

.....

2

..... [2]

(iii) Give an explanation for the stationary phase between days 12 and 16.

.....

.....

.....

.....

..... [4]

(iv) Calculate the relative growth rate of the population between day 6 and day 8. Show your working.

Answer day⁻¹ [2]

(b) Describe how a prokaryote divides.

.....

.....

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.....

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.....

..... [4]

[Total: 16]

5 (a) Describe **two** different methods of contraception which **do not** involve the use of hormones.

1

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.....

.....

2

.....

.....

..... [4]

(ii) Explain the possible effects of the hedge on the growth of the radish plants.

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

(iii) Outline the processes involved in increasing the mass of the root.

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

Copyright Acknowledgements:

Question 3. Table 3.1 © Data adapted from Archives of Internal Medicine 1996; 156:1837/40.
Question 6. Fig. 6.1 © Graph from Journal of Biological Education Summer 2000 Vol 34 Number 3 p162 Institute of Biology.

OCR has made every effort to trace the copyright holder of items used in this Question paper, but if we have inadvertently overlooked any, we apologise.