

OXFORD CAMBRIDGE AND RSA EXAMINATIONS Advanced Subsidiary GCE

HUMAN BIOLOGY 2857

Growth, Development and Disease

Monday 10 JANUARY 2005 Morning 1 hour

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

Candidate Name	Centre Number	Candidate Number

TIME 1 hour

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 provided 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	13					
2	11					
3	12					
4	6					
5	7					
6	11					
TOTAL	60					

Answer all the questions.

1

(a) (i) Thermography is one technique that may be used to detect cancers of the breast. Outline how thermography works. [3] (ii) Suggest why thermography is not considered reliable enough to be used for routine breast screening. [1] (b) Surgery may be used to treat breast cancers. Name and describe briefly two surgical methods that may be used. name description [4]	Bre	Breast cancer is a common form of cancer in women throughout the world.					
(ii) Suggest why thermography is not considered reliable enough to be used for routine breast screening. [1] (b) Surgery may be used to treat breast cancers. Name and describe briefly two surgical methods that may be used. name description name description	(a)	(i)	· · ·				
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		nam	ne				
[4]		des	cription				
[4]							
			[4]				

(c) Table 1.1 shows the prevalence of breast cancer in white and asian South African women in 1999. The figures for each age group are given per 100 000 women.

Table 1.1

	numbers per 100 000					
age	white South African women	asian South African women				
30 – 34	25	25				
35 – 39	50	35				
40 – 44	75	40				
45 – 49	130	75				
50 – 54	140	75				
55 – 59	160	120				
60 – 64	150	110				
65 – 69	190	130				
70 – 74	175	120				

(i)	Describe the trends shown by the data in Table 1.1.
	[3]
(ii)	In a sample of 350 000 asian South African women in the 50-54 age group, how many are likely to have breast cancer?

Answer = [2]

[Total: 13]

2	The introduction	of a foreign anti	gen into the blood	d triggers an immu	ne response
_	THE IIII OUUCION	oi a ioreigii airii	gen into the block	a inggers an inimu	ne response.

(a)	Explain the meaning of the term <i>immune response</i> .

(b) Fig. 2.1 shows the change in antibody concentration in human blood, in response to the introduction of antigen **X**.

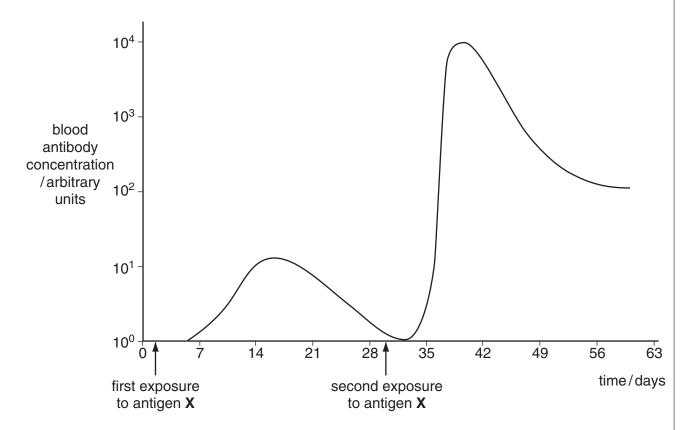


Fig. 2.1

Using the information in Fig. 2.1,

antigen X;			
1	 	 	
2	 	 	

.....[2]

(i) describe two differences in the response to the first and second exposure to

(ii	explain how a vaccine works.
(c) Fi	g. 2.2 shows the structure of an antibody.
(C) 11	
	A diagram has been removed due to third party copyright restrictions
	Details:
	A diagram showing the structure of an antibody
	Fig. 2.2
D	escribe the functions of the parts labelled on Fig. 2.2.
••	
••	
••	
••	
••	ורכז
••	[3] [Total: 11]

3 (a)	In this question, one mark is available for the quality of spelling, punctuation and grammar.
	State and explain the nutritional requirements of a pregnant woman, from the time of conception to the birth of her baby.
	[6]
	[Ο]

Quality of Written Communication [1]

[Total: 12]

(b)	Describe developin		amounts	of	alcohol	ingested	by	the	mother	may	affect	the
		 										[5]

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[Total: 6]

- **4** Sickle cell anaemia is a disease caused by a change to a single amino acid in the beta polypeptide chains of haemoglobin.
 - Fig. 4.1 shows the base sequence in part of the DNA coding strand for the beta chain.
 - Strand P shows the base sequence for normal haemoglobin.
 - Strand **Q** shows the base sequence for sickle cell haemoglobin.

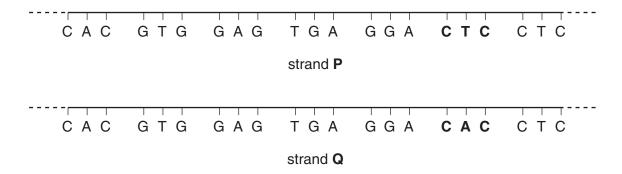


Fig. 4.1

(a)	Stat	te the name given to this kind of gene (point) mutation.
		[1]
(b)	Des	cribe the effect of this mutation on
	(i)	the haemoglobin produced;
		[1]
	(ii)	the red blood cells containing the mutated haemoglobin;
		[2]
	(iii)	the individual with sickle cell anaemia.
		[2]

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5

_	the development of the embryo, cells divide by mitosis, grow and differentiate. The radually become organised into tissues and organs.
(a) (i)	State what is meant by the term <i>cell differentiation</i> .
	[2]
(ii)	Describe the relationship between tissues and organs.
	[2]

Fig	. 5.1 shows an animal cell at different stages of mitosis.
i 4	4 images have been removed due to third party copyright restrictions
!	Details:
	4 images of an animal cell at different stages of mitosis
	Fig. 5.1
(i)	Arrange the stages shown in Fig. 5.1 in the correct order by writing the letters in the correct sequence.
	[1]
(ii)	Compare the genetic makeup of the daughter cells produced by mitosis with that of the original parent cell.
	[Total:

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6

HIV	AIDS is arguably the most serious disease to spread throughout the world.	
(a)	Outline the relationship between HIV and AIDS.	
		[3]
(b)		
	1	
	2	
	3	
(c)	Antibiotics have been used successfully to treat many infectious diseases.	[3]
(0)	Why are antibiotics not used to treat HIV infection?	
		[1]

(d) It is difficult to calculate accurately the number of people in the United Kingdom who are

HIV positive.

It ha	as been suggested that compulsory HIV screening should be introduced.
(i)	State two reasons, other than lack of compulsory screening , why it is difficult to calculate accurately the number of people who are HIV positive.
	[2]
(ii)	Outline two ethical problems that could arise from compulsory screening.
	[2]
	[Total: 11]

END OF QUESTION PAPER

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Copyright Acknowledgments:

Fig. 2.2 and Fig. 5.1 from Taylor, D.J. Green, N.P.O., Stout, G.W., Soper, R. (ed.) 1997. Biological Science I & II. Third edition. C.U.P. ISBN: 0-521-56178-7

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