



ADVANCED SUBSIDIARY GCE
HUMAN BIOLOGY
 Growth, Development and Disease

2857

Candidates answer on the question paper

OCR Supplied Materials:
 None

Other Materials Required:

- Electronic calculator
- Ruler (cm/mm)

Monday 1 June 2009
Afternoon

Duration: 1 hour



| | | | |
|-----------------------|--|----------------------|--|
| Candidate Forename | | Candidate Surname | |
|-----------------------|--|----------------------|--|

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|---------------|--|--|--|--|--|------------------|--|--|--|--|
| Centre Number | | | | | | Candidate Number | | | | |
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- 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.
- This document consists of **12** pages. Any blank pages are indicated.

FOR EXAMINER'S USE

| Qu. | Max. | Mark |
|--------------|-----------|------|
| 1 | 11 | |
| 2 | 14 | |
| 3 | 13 | |
| 4 | 11 | |
| 5 | 11 | |
| TOTAL | 60 | |

Answer **all** the questions.

- 1 Changes in the factors that control the cell cycle can lead to cells becoming cancerous.

Fig. 1.1 shows the main stages of the cell cycle.

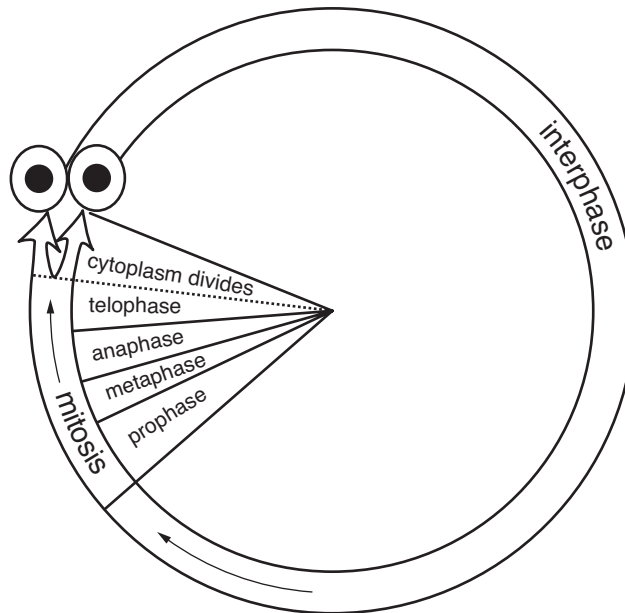


Fig. 1.1

- (a) Identify the stages at which each of the following occurs:

- (i) spindle fibres form;

..... [1]

- (ii) chromatids move to opposite poles of the cell;

..... [1]

- (iii) organelles within the cell replicate.

..... [1]

- (b) Describe the genetic characteristics of cells produced by mitosis.

.....

 [2]

- (c) Some anti-cancer drugs act by preventing spindle formation.

Suggest how these drugs may slow down or prevent the development of a tumour.

.....

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.....

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.....

.....

..... [3]

- (d) At some stage in the human life cycle, meiosis, another form of cell division, takes place.

Explain the importance of **meiosis** in the human life cycle.

.....

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.....

..... [3]

[Total: 11]

- 2 (a) One third of the world's population is infected with *Mycobacterium tuberculosis*.

Describe how the bacteria may be spread.

.....

.....

.....

.....

..... [2]

- (b) Explain how the rise in HIV infection has led to an increase in the number of cases of tuberculosis (TB).

.....

.....

.....

.....

..... [2]

Discuss the role of the public health service and World Health Organisation (WHO) in the control of TB.

..... [9]

[Total: 14]

- 3** Thermography and ultrasound are two techniques that have been developed to detect breast cancer.

(a) Outline how thermography works.

.....

.....

.....

.....

.....

.....

..... [3]

(b) Why is thermography no longer routinely used to screen for breast cancer?

.....

..... [1]

(c) Surgery may be used to treat breast cancers.

Name and describe briefly **two** surgical methods that may be used.

name.....

description

.....

.....

name.....

description

.....

..... [4]

- (d) Fig. 3.1 shows the prevalence of breast cancer in white and Asian women in South Africa in 1999. The numbers in each age group are shown per 100 000 women.

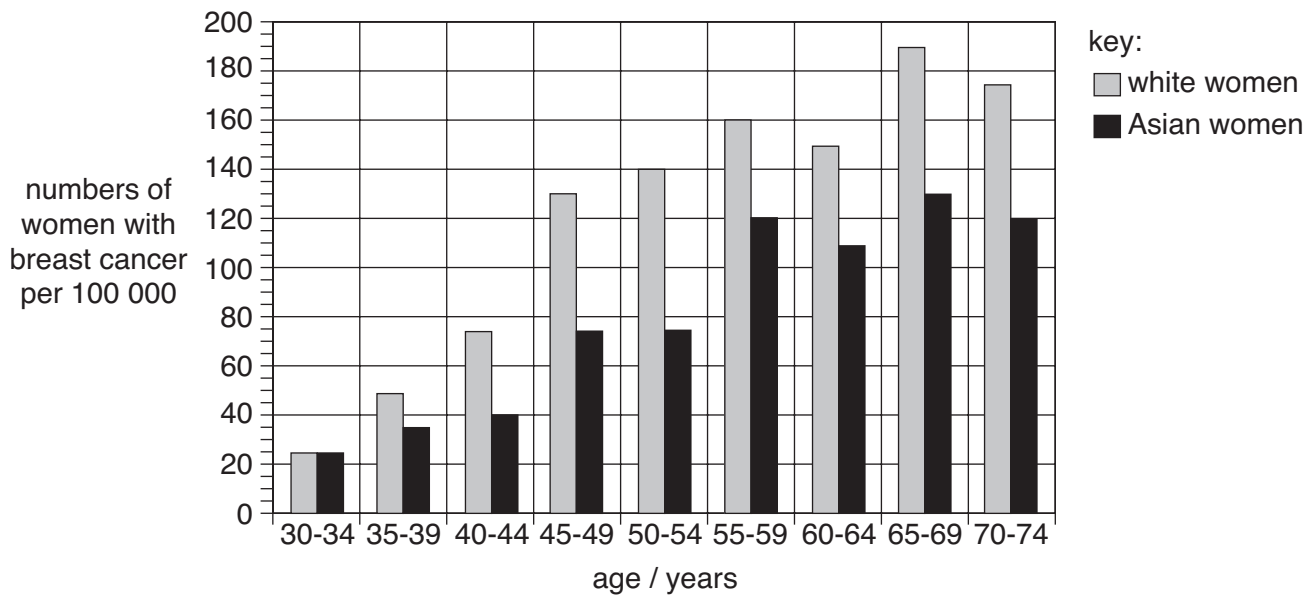


Fig. 3.1

- (i) Describe the trends shown by the data in Fig. 3.1.

.....

.....

.....

.....

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.....

.....

.....

..... [3]

- (ii) In a sample of 350 000 Asian women aged between 45 and 49 years, how many are likely to have breast cancer?

Show your working and give your answer to the **nearest whole number**.

Answer = [2]

[Total: 13]

- 4 Antibodies are part of the immune response generated when a disease-causing organism enters the body.

(a) (i) State the type of cell that produces antibodies.

..... [1]

(ii) State **two** processes involved in the production of this type of cell.

.....

..... [2]

(b) Fig. 4.1 shows the structure of an antibody.

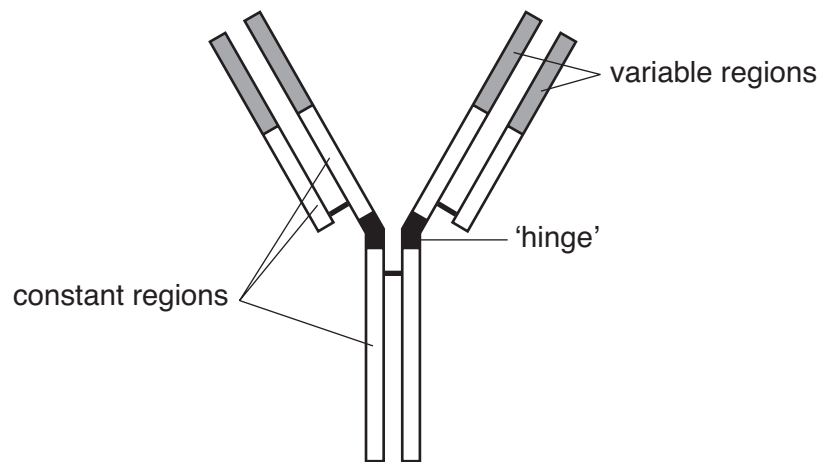


Fig. 4.1

Describe the functions of the parts labelled on Fig. 4.1.

variable regions

.....

'hinge'

.....

constant regions

..... [3]

- (c) Fig. 4.2 shows the change in antibody concentration in human blood in response to the introduction of an antigen, **X**.

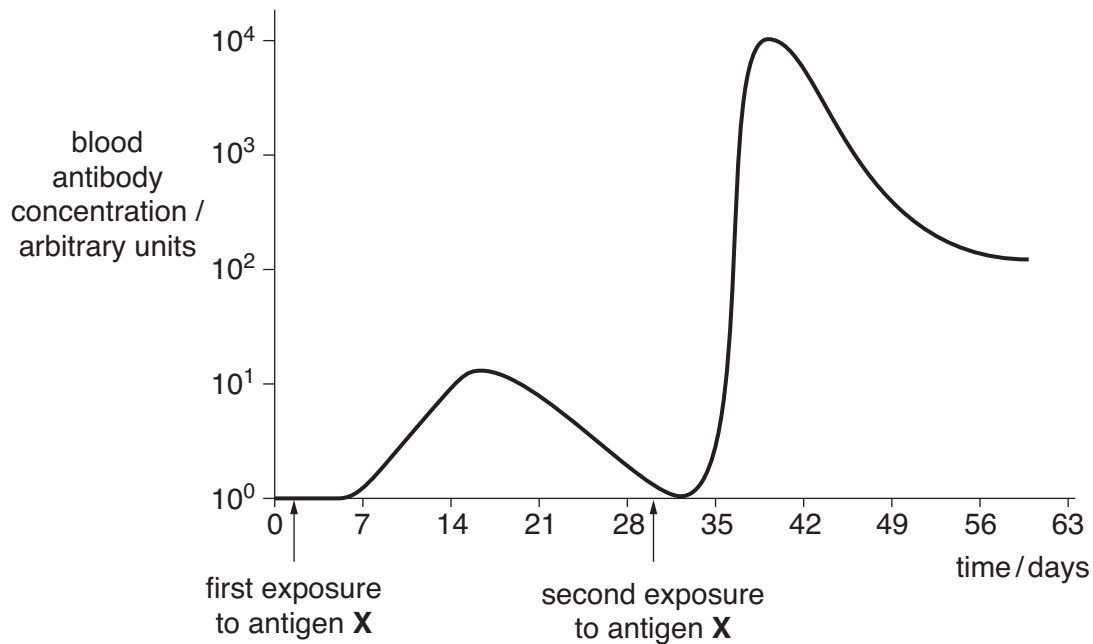


Fig. 4.2

Using the information in Fig. 4.2, describe **two** differences in the responses to the first and to the second exposure to antigen **X**.

1.....

.....

2.....

..... [2]

- (d) Antibodies may be produced by the body as a result of natural or artificial immunity to disease. Explain the difference between natural and artificial immunity in this context.

.....

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.....

.....

..... [3]

[Total: 11]

5 The destruction of tropical rainforests is a cause for concern.

(a) State **three** reasons why tropical rainforests continue to be destroyed.

- 1
-
- 2
-
- 3
- [3]

(b) The tropical rainforest is home to a vast number of plant species.

Plant species with the greatest therapeutic potential can be identified from information about the traditional use of the plants.

(i) Discuss what is meant by the 'therapeutic potential' of plants.

-
-
-
-
-
- [3]

(ii) Suggest how the disappearance of the tropical rainforest may result in a loss of information about the traditional use of the plant species.

-
-
-
- [2]

- (c) Outline measures that can be introduced to stop the decline in the tropical rainforest.

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.....

.....

..... [3]

[Total: 11]

END OF QUESTION PAPER

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