

**ADVANCED SUBSIDIARY GCE
HUMAN BIOLOGY**

2857

Growth, Development and Disease

MONDAY 4 JUNE 2007

Morning

Time: 1 hour

Additional materials: Electronic calculator
Ruler (cm/mm)



* GCE / T21359 *

Candidate
Name

Centre
Number

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Candidate
Number

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INSTRUCTIONS TO CANDIDATES

- Write your name, Centre Number and Candidate Number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- **WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.**

INFORMATION FOR CANDIDATES

- The number of marks for each question 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	10	
2	13	
3	11	
4	15	
5	11	
TOTAL	60	

This document consists of **12** printed pages.

Answer **all** the questions.

- 1 The body makes over 100 000 different proteins from polypeptides. DNA contains the information needed to make the polypeptides that form proteins.

Fig. 1.1 shows how the genetic information in DNA is used to make a polypeptide.

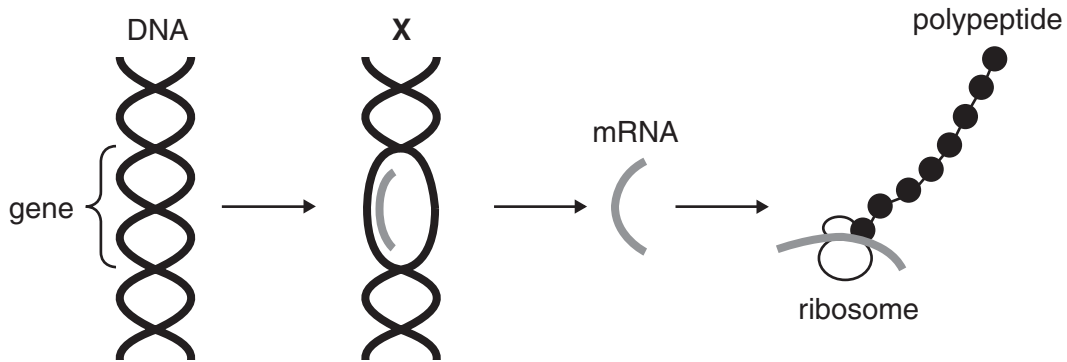


Fig. 1.1

- (a) Letters **A** to **E** below show some of the steps in the synthesis of a polypeptide.

Use the information in Fig. 1.1 to put steps **A** to **E** in the correct order.

The first one has been done for you.

- A** The mRNA moves into the cytoplasm.
- B** The ribosome and mRNA cause the amino acids to join together in the correct order to form a polypeptide.
- C** mRNA is made as a copy of the genetic code for a polypeptide.
- D** The mRNA attaches to a ribosome.
- E** Part of the DNA molecule unwinds and 'unzips'.

E

..... [3]

(b) (i) Name the stage of protein synthesis shown by **X** in Fig. 1.1.

..... [1]

(ii) Name the part of the cell where **X** takes place.

..... [1]

(iii) Name the bonds that are broken when the DNA molecule unwinds and ‘unzips’.

..... [1]

(c) DNA contains the genetic code.

Explain what is meant by the *genetic code*.

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..... [4]

[Total: 10]

2 In the UK, lung cancer accounts for 22% of all deaths from cancer.

There is a strong link between smoking and lung cancer.

Fig. 2.1 shows the number of deaths from lung cancer in 2003.

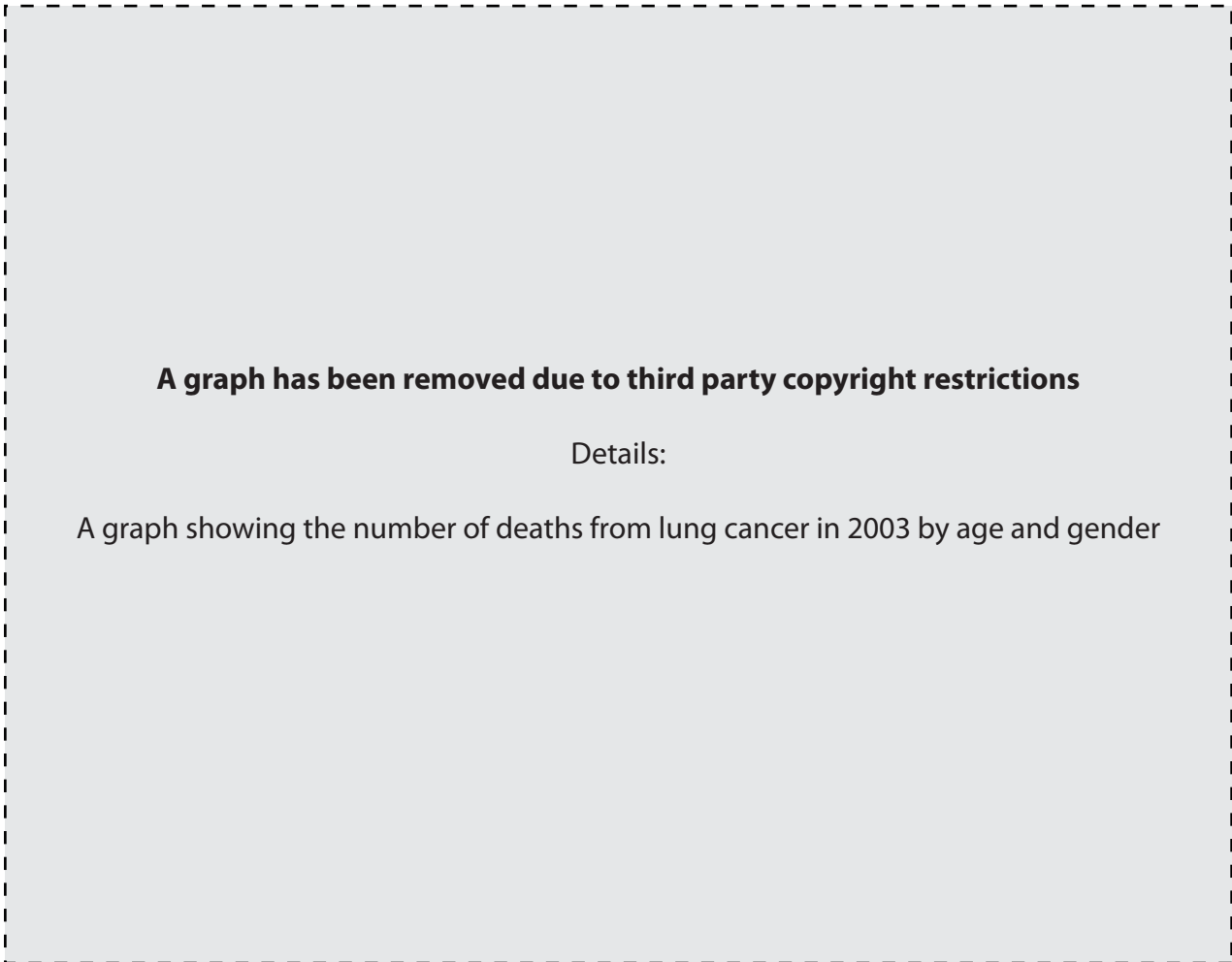


Fig. 2.1

(a) Using the information in Fig. 2.1, describe and suggest reasons for the trends shown by the data.

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..... [4]

3 Foetal and infant development is monitored carefully by skilled health specialists.

(a) Describe two methods of measuring the growth of a human foetus.

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.....

..... [4]

(b) A research group compared the differences in birth weight of babies born to mothers who smoked and to mothers who did not smoke.

Table 3.1 shows the results of this research.

Table 3.1

<p>A table has been removed due to third party copyright restrictions</p> <p>Details:</p> <p>A table showing the results of the above mentioned experiment</p>

(i) Using the data in Table 3.1, calculate the percentage of babies who weighed less than 2500g at birth, for mothers who smoked .

Show your working. Give your answer to the nearest whole number .

Answer =% [2]

- (ii) The results in Table 3.1 suggest that babies born to mothers who smoke are more likely to have lower birth weights.

State **one** component of tobacco smoke **and** explain how it would lead to a reduction in a baby's birth weight.

component

explanation

.....

.....

..... [3]

- (c) (i) State why women who are planning to become pregnant are advised to take folic acid supplement.

..... [1]

- (ii) Suggest why a pregnant woman may have a low level of folic acid in her body.

.....

..... [1]

[Total: 11]

4 (a) Fig. 4.1 shows the structure of the human immunodeficiency virus, HIV.

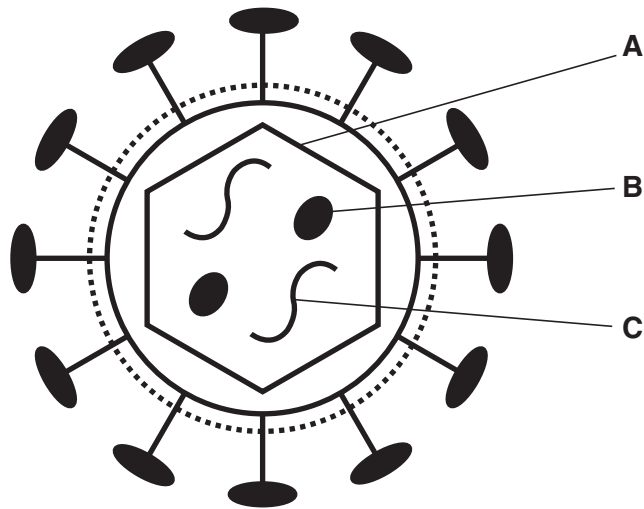


Fig. 4.1

(i) Name the parts A to C.

- A
- B
- C [3]

(ii) Explain why people infected with HIV may develop AIDS.

-
-
-
-
-
-
-
-
- [3]

(b) (i) State two groups of people in the UK who are at a higher risk of being infected with HIV.

For each group, describe **one** precaution that can be taken to reduce the risk of **infection** with HIV.

group 1

precaution

.....

group 2

precaution

..... [4]

(ii) Suggest why it is difficult to make an effective vaccine against HIV.

.....

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..... [2]

(c) Severe acute respiratory syndrome (SARS) is caused by a virus.

In 2003, health officials feared that this virus could have given rise to a new, highly infectious disease that might have led to a pandemic.

(i) State what is meant by the term *pandemic*.

..... [1]

(ii) Suggest why the **spread** of a newly emerged infectious disease is likely to be difficult to control.

.....

.....

..... [2]

[Total: 15]

5 (a) Blood is classified as a tissue.

Explain the meaning of the term *tissue*.

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..... [2]

(b) White blood cells play an important role in fighting disease.

Fig. 5.1 shows photomicrographs of **two** different types of white blood cell in a blood film.

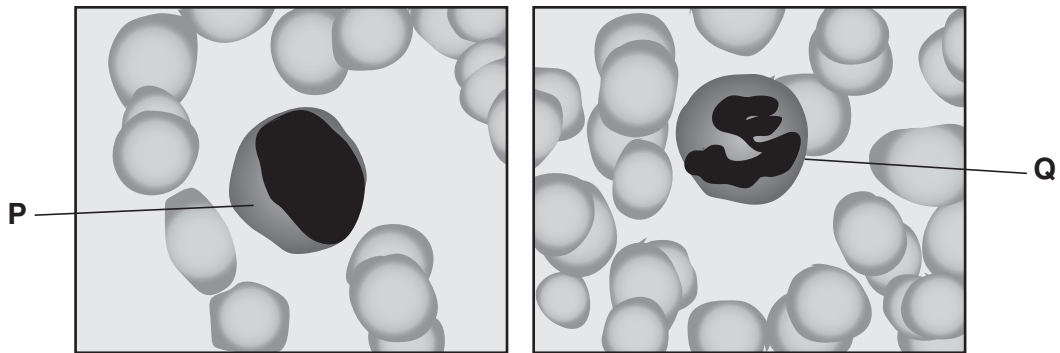


Fig. 5.1

(i) Name the white blood cells, **P** and **Q** shown in Fig. 5.1.

P
Q [2]

(ii) White blood cells are produced in the bone marrow.

State **two** places in the body where white blood cells **mature**.

1
2 [2]

(iii) Describe the role of the white blood cell **Q** in fighting disease.

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..... [5]

[Total: 11]

END OF QUESTION PAPER

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Copyright Acknowledgements:

Fig. 2.1 Source: UK Lung Cancer mortality statistics, Cancer Research UK, www.cancerresearchuk.org
Table 3.1 Source: University College London, Pharmacology Department, www.ucl.ac.uk/Pharmacology/

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