OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
Advanced Subsidiary GCE

HUMAN BIOLOGY 2857

Growth, Development and Disease

Monday **6 JUNE 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	5	
2	15	
3	11	
4	11	
5	7	
6	11	
TOTAL	60	

This question paper consists of 13 printed pages and 3 blank pages.

Registered Charity Number: 1066969
[Turn over

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For Examiner's Use

Answer all the questions.

1 Fig. 1.1 shows a karyotype produced from foetal cells using a technique called amniocentesis.

A diagram has been removed due to third party copyright restrictions

Details:

A diagram showing a karyotype produced from foetal cells using a technique called amniocentesis

Fig. 1.1

(a) State the sex of the foetus in Fig. 1.1 and give a reason for your answer.

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.....[2]

(b) Chromosomal mutations can cause conditions such as Down's syndrome. Chromosomal mutations can be detected using amniocentesis.

Explain why chromosomal mutations in a foetus are easier to detect, using amniocentesis, than gene (point) mutations.

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.....[3]

[Total: 5]

[Turn over

2 An understanding of the risk factors associated with the development of cancer contributes to its prevention and treatment.

(a) (i) State **two** environmental factors, **other than tobacco smoke**, that may increase the risk of developing cancer.

1 ……..

2 .....[2]

(ii) Explain the role of oncogenes in the development of a cancerous cell.

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(b) Fig. 2.1 shows the death rates per year from lung cancer, according to smoking habits.

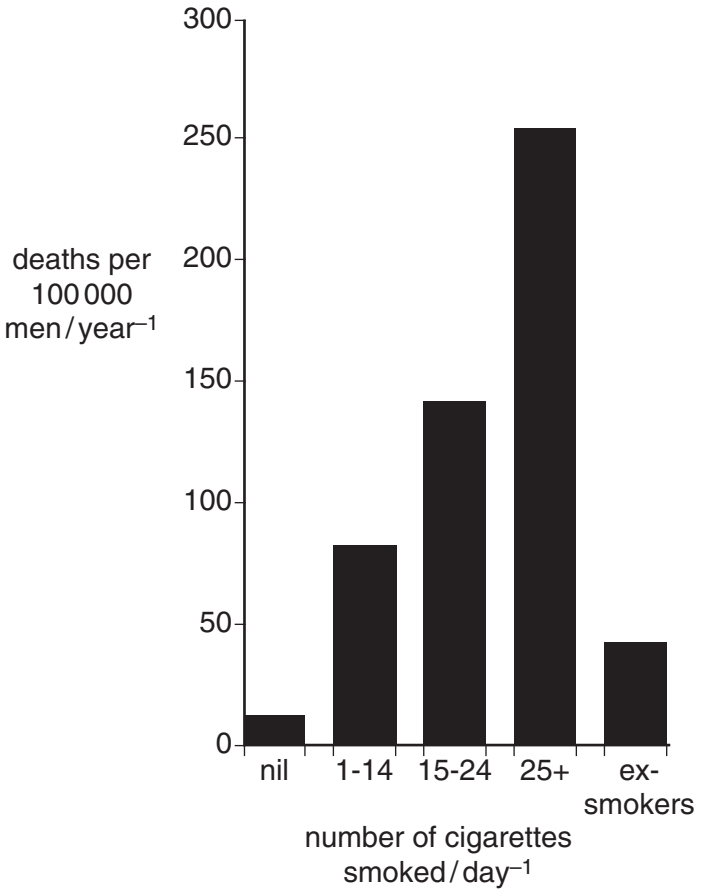

Fig. 2.1

Using the information in Fig. 2.1, describe **and** explain the trends shown by the data.

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(c) In this question, one mark is available for the quality of use and organisation of scientific ideas.

Describe the methods which may be used to treat lung cancer.

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Quality of Written Communication [1]

[Total: 15]

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3 (a) DNA is a large molecule made up of nucleotides. Each nucleotide has three components. Fig. 3.1 is a diagram of part of a DNA molecule.

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Details:

A diagram of part of a DNA molecule

Fig. 3.1

(i) Name the parts of the nucleotide labelled E and F.

E .....

F .....[2]

(ii) Name the type of bond between A and T.

..... [1]

(b) In a sample of DNA, 18% of the bases were found to be adenine (A). Calculate the percentage of guanine (G).

Answer = ...% [2]

(c) When a cell divides, the DNA in the cell replicates.
Fig. 3.2 shows three diagrams, representing possible methods of DNA replication.

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Details:

A diagram representing possible methods of DNA replication

Fig. 3.2

(i) State which diagram, X, Y or Z, represents the correct method of DNA replication.

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(ii) Explain why DNA replication is described as semi-conservative.

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(iii) Describe three features of DNA which make it the ideal genetic material.

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[Total: 11]

4 In 1928, Sir Alexander Fleming was the first scientist to observe the effect of an antibiotic on the growth of a bacterium. The bacterium was called *Staphylococcus aurens.*
Antibiotics are now widely used in the treatment of infectious diseases.

(a) (i) State what is meant by the term *infectious disease.*

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(ii) Suggest why the discovery of antibiotics was so important.

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(iii) Name the **two** groups of organism that **produce** antibiotics.

1 .....

2 .....[2]

(b) Excessive use of antibiotics has led to the development of resistant strains of bacteria, such as methicillin-resistant *Staphylococcus aureus* (MRSA).

Explain how the excessive use of antibiotics has led to the development of resistant strains of bacteria.

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[Total: 11]

5 Tuberculosis (TB) is a disease caused by the bacterium *Mycobacterium tuberculosis*. Historically, TB has been one of the world's worst fatal diseases and it still kills over 1.5 million people every year.

(a) Describe the role of the Heaf test in a vaccination programme for TB.

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(b) How would a suspected case of TB be confirmed?

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(c) In the United Kingdom, TB is a notifiable disease. Suggest what actions should be taken by a local health service when a case of TB is confirmed.

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[Total: 7]

6 (a) Different parts of the body grow at different rates.

Fig. 6.1 shows the mean increase in body height and the mean increase in the diameter of the pelvic girdle, as a percentage of the adult size, in a sample of 8 to 18 year old girls .

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Details:

A graph showing the mean increase in body height and the mean increase in the diameter of the pelvic girdle, as a percentage of the adult size, in a sample of 8 to 18 year olds

Fig. 6.1

Using the information in Fig. 6.1,

(i) describe the pattern of growth shown by the graph for body height;

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(ii) explain the shape of the graph showing changes in the diameter of the pelvic girdle.

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(b) State the importance of iron in the diet of a girl.

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.....[1]

(c) A woman who is planning to become pregnant is advised by her doctor to supplement her diet with folic acid.

(i) State why this increased intake of folic acid is advised.

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.....[1]

(ii) Her doctor will also ask her if she has had german measles or the rubella vaccination.

Explain why this information is important.

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[Total: 11]

END OF QUESTION PAPER

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