UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **9700/23**

Paper 2 Structured Question AS **October/November 2012**

1 hour 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces provided at the top of this page.
Write in dark blue or black ink.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
3	
4	
5	
6	
Total	

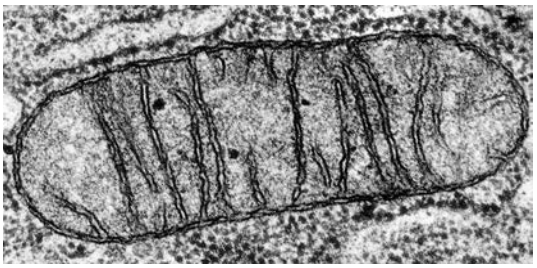
This document consists of **13** printed pages and **3** blank pages.

Answer **all** the questions.

For Examiner's Use

1 Fig. 1.1 shows electron micrographs of some eukaryotic cell organelles.

A



B

C

D

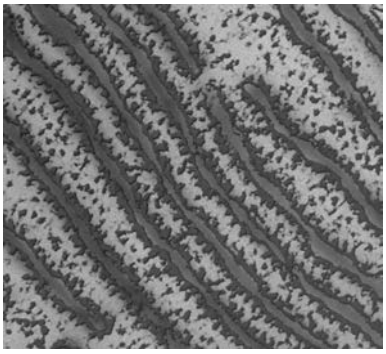


Fig. 1.1

For each of the organelles **A**, **B**, **C** and **D**, shown in Fig. 1.1, state the name and function of each.

For Examiner's Use

A *name* .....

function .....

B *name* .....

function .....

C *name* .....

function .....

D *name* .....

function .....[8]

[Total: 8]

2 Antibiotics are drugs which are very important in the treatment and cure of some diseases.

For Examiner's Use

(a) Underline the disease or diseases in the list below which are treatable with antibiotics.

cholera

malaria

HIV/AIDS

tuberculosis (TB)

[1]

(b) When patients are prescribed a course of antibiotics, they must not stop taking the antibiotics as soon as they start to feel better, or when they feel that the disease symptoms have gone.

Explain the importance of taking a complete course of antibiotics.

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.....[3]

(c) Some antibiotics act as competitive inhibitors of enzymes in pathogens.

(i) Describe what is meant by the term competitive inhibitor.

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.....[3]

Penicillin acts as a competitive inhibitor of one of the enzymes involved in bacterial cell wall synthesis.

For Examiner's Use

(ii) State why penicillin, which is an enzyme inhibitor, can be taken by humans.

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..... [1]

(iii) Suggest the effect which penicillin will have on bacterial cells.

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..... [3]

[Total: 11]

3 A study was carried out on a large number of people, some of whom were smokers. The study investigated the link between percentage of deaths due to lung cancer in smokers and their smoking habits. The age at which they started smoking and the number of cigarettes smoked per day were recorded. The results of the study are shown in Fig. 3.1.

For Examiner's Use

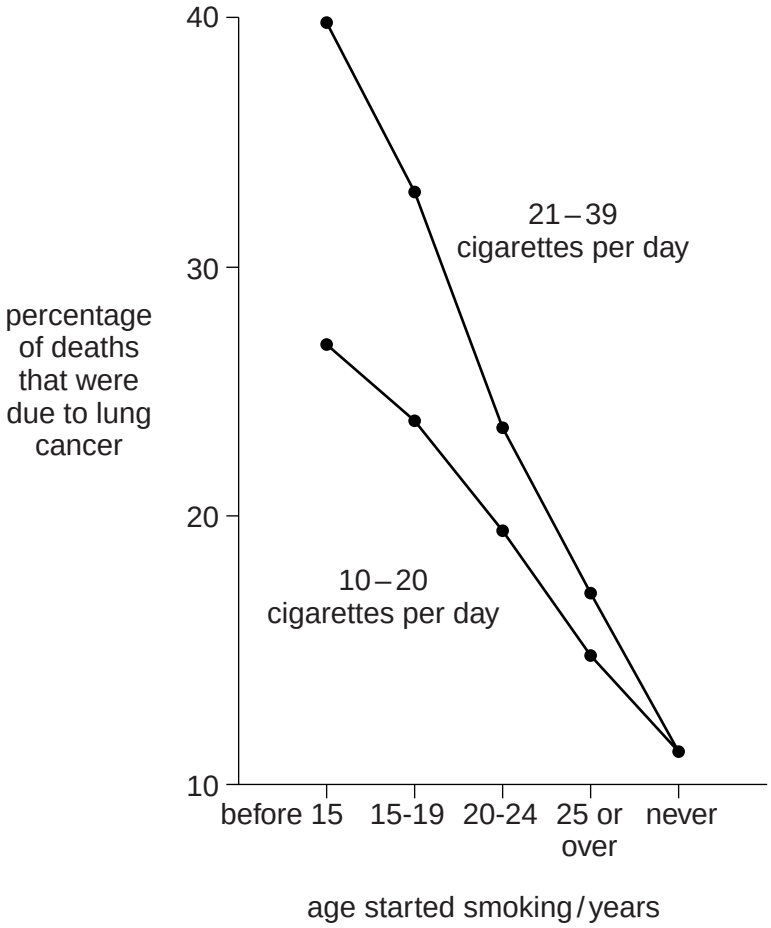

Fig. 3.1

(a) Explain what the results in Fig. 3.1 show about the link between cigarette smoking and percentage of deaths due to lung cancer.

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.....[4]

(b) Tobacco smoke contains many substances which are harmful to the body.

For Examiner's Use

Outline the harmful effects on the cardiovascular system of:

(i) carbon monoxide

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.....

.....[2]

(ii) nicotine.

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.....[2]

(iii) Describe briefly the effects of tar on the goblet cells and cilia of the trachea.

goblet cells .....

.....

.....

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cilia .....

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.....[4]

[Total: 12]

4 Fig. 4.1 is an electron micrograph of a transverse section through a plant stem. The xylem vessels are clearly visible.

For Examiner's Use

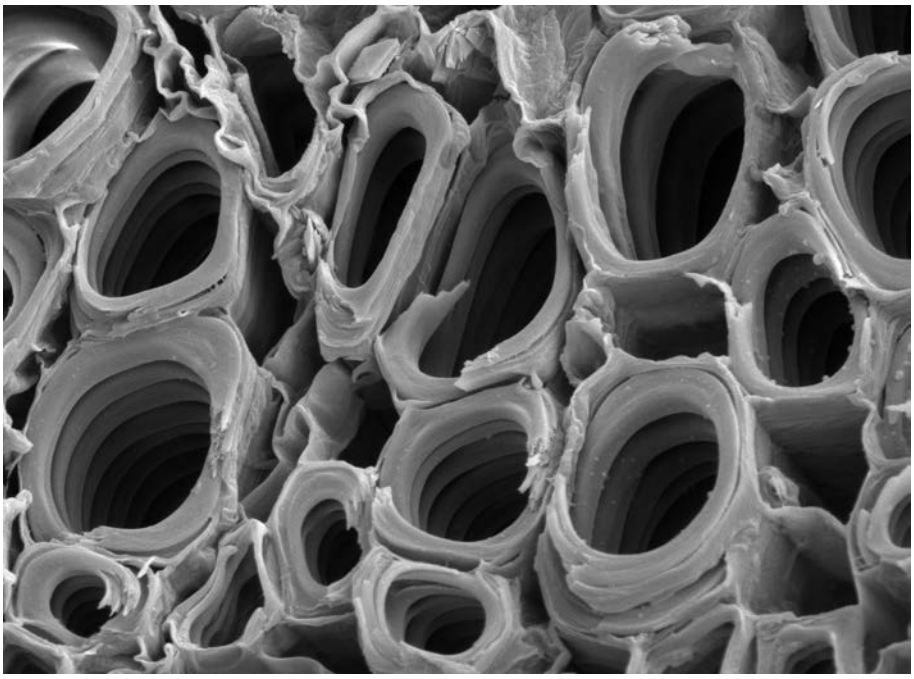

Fig. 4.1

(a) Calculate the magnification of the electron micrograph in Fig. 4.1.

Show your working and give your answer to the nearest 100.

answer .....[2]

(b) Describe how the structure of xylem vessels is adapted to their function.

For Examiner's Use

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.....[3]

(c) Describe **and** explain how water moves from the xylem vessels in the leaves to the atmosphere surrounding the leaves of the plant.

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[Total: 10]

5 **(a)** Describe the role of the ribosome in translation.

For Examiner's Use

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..... [4]

Fig. 5.1 is a diagram of a section of mRNA showing the sequence of three of the codons.

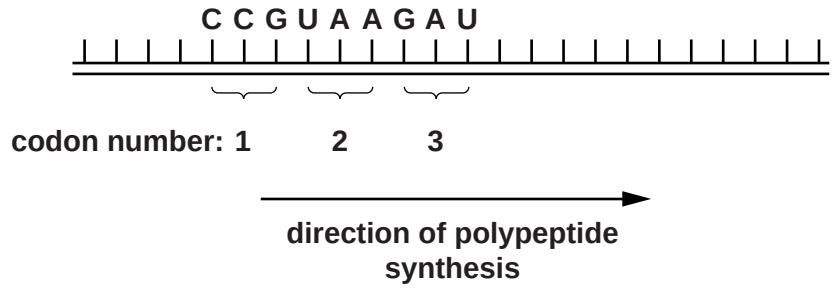

Fig. 5.1

(b) State the base sequences of:

(i) the tRNA anticodon complementary to **codon 1**

..... [1]

(ii) the DNA sequence which coded for **codon 3**.

..... [1]

(c) The three codons in Fig. 5.1 are near the start of the sequence coding for a protein.

For Examiner's Use

Explain the consequence of a mutation which deletes the **U** from **codon 2**.

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[Total: 9]

6 A woodland ecosystem was investigated and a food web was constructed. This food web is shown in Fig. 6.1.

For Examiner's Use

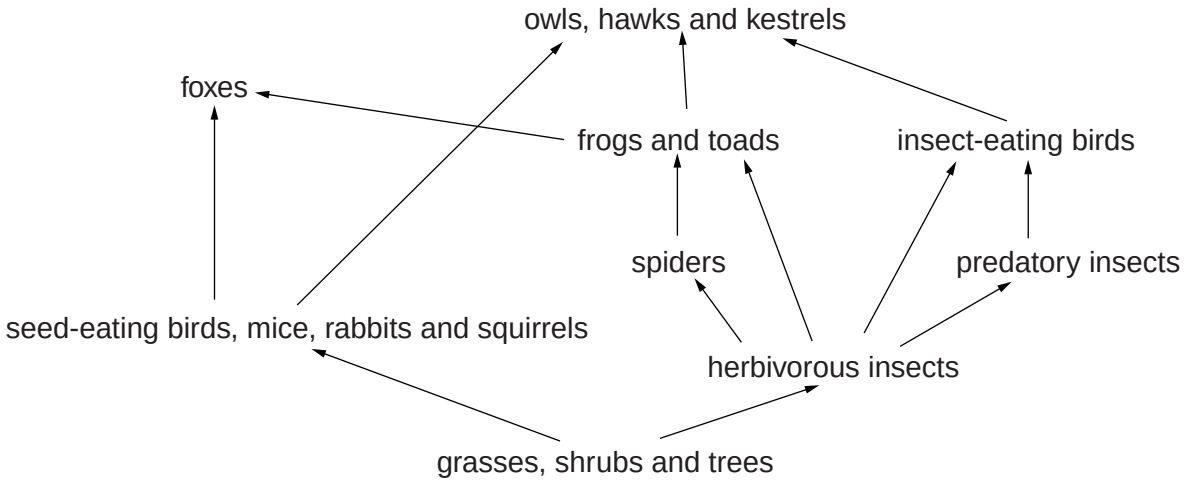

Fig. 6.1

(a) State the meaning of the term *ecosystem*.

.....

.....

.....[2]

(b) Name one group of organisms from Fig. 6.1 that are:

(i) producers

.....[1]

(ii) **only** secondary consumers.

.....[1]

(c) Explain why only a small percentage of the energy present at each trophic level is available to the organisms at the next level.

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.....[3]

(d) Fig. 6.1 shows the flow of energy but not the cycling of nutrients in the ecosystem.

For Examiner's Use

Outline what happens to the nitrogen-containing compounds in the organisms at the top of the food web.

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.....[3]

[Total: 10]

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