

Candidate Name _____

| Centre Number | Candidate Number |
|---------------|------------------|
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CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Advanced Subsidiary Level

BIOLOGY
PAPER 2

8700/2

OCTOBER/NOVEMBER SESSION 2001

1 hour

Candidates answer on the question paper.
No additional materials are required.

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces on the question paper.

All working for numerical answers must be shown.

INFORMATION FOR CANDIDATES

The intended 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 question paper consists of 11 printed pages and 1 blank page.



- 1 Fig. 1.1 shows a three-dimensional diagram of part of a plant stem.

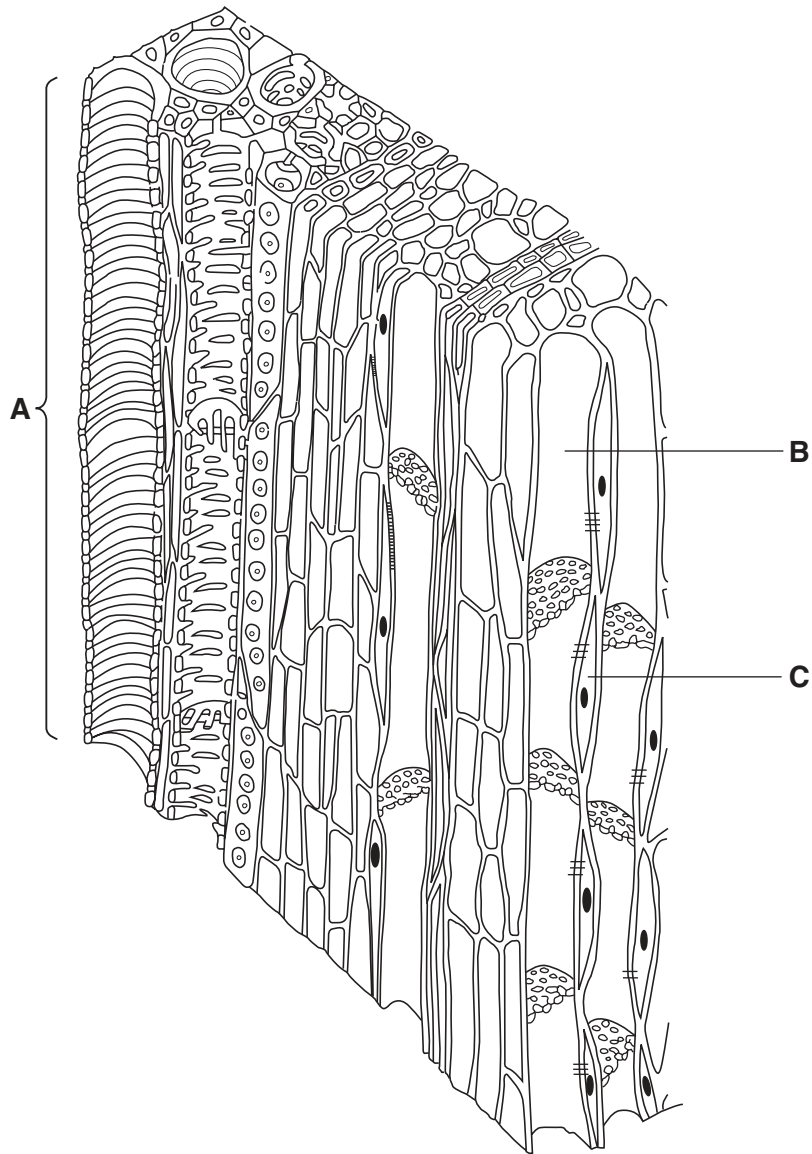


Fig. 1.1

- (a) Identify the structure labelled **A** and state **one** function it performs in the stem.

.....
 [1]

(b) State three main structural features that help **A** to carry out this function.

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

(c) The cell labelled **B** is involved in the transport of the products of photosynthesis up and down the stem.

Identify the cell labelled **C** and explain how it is involved in this process.

.....
.....
.....
.....[3]

[Total : 7]

- 2 Fig. 2.1 shows diagrams of two alveoli from the lungs of a smoker, **A**, and a non-smoker, **B**, after exhalation is complete.

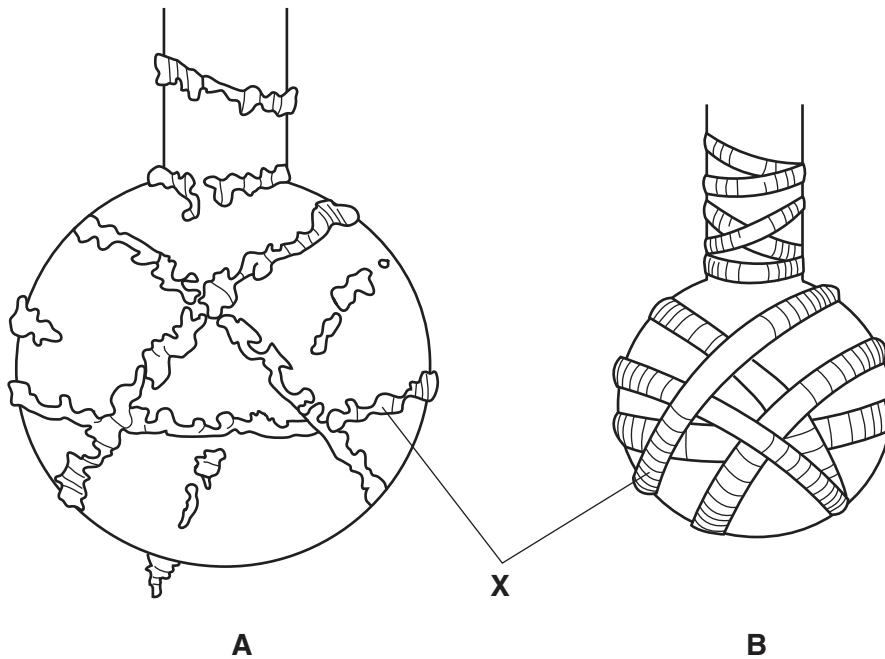


Fig. 2.1

- (a) Identify the fibres labelled **X**, in Fig. 2.1, that surround the alveoli.

.....[1]

- (b) With reference to Fig. 2.1, explain why people who have smoked heavily for a long time often have difficulty in breathing and in obtaining sufficient oxygen.

.....

[3]

(c) State two pieces of epidemiological evidence and one piece of experimental evidence to link smoking with lung cancer.

epidemiological evidence

1.

.....

2.

.....

experimental evidence

1.

.....[3]

[Total : 7]

- 3 Fig. 3.1 is a diagram of part of an α helix of a polypeptide chain commonly found in many types of protein.

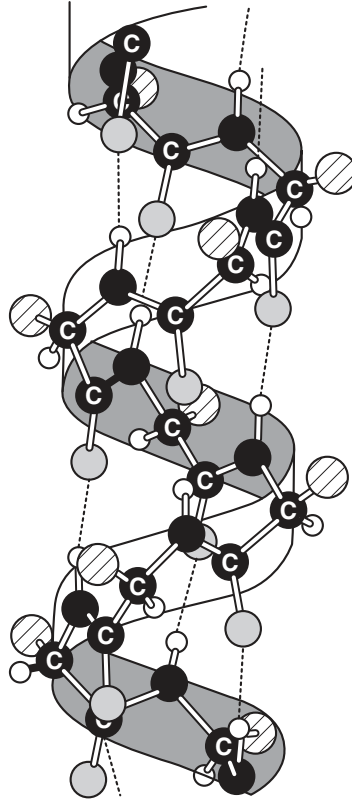


Fig. 3.1

- (a) (i) Name the repeating monomer of a polypeptide chain.

.....[1]

- (ii) Explain what would happen to the α helix if the polypeptide chain was heated to a temperature above 60 °C.

.....

.....[2]

- (b)** In globular proteins, the polypeptide chain bends and folds to give a more compact shape. This is the tertiary structure of the protein.

Name three types of bond that help to maintain the tertiary structure.

1.[3]
2.
3.

- (c)** Monosaccharides can also be linked together to form long chain molecules called polysaccharides.

State two ways, other than the names of the monomers present, in which the structure of a polysaccharide chain differs from that of a polypeptide chain.

1.
2.[2]

- (d)** The fibrous protein collagen and the polysaccharide cellulose both possess considerable tensile strength.

List two features that contribute to the strength of

- (i)** collagen;

1.
2.[2]

- (ii)** cellulose.

1.
2.[2]

[Total : 12]

- 4 Fig. 4.1 shows the process of translation occurring at a ribosome in a cell that synthesises enzymes that are secreted into the gut.

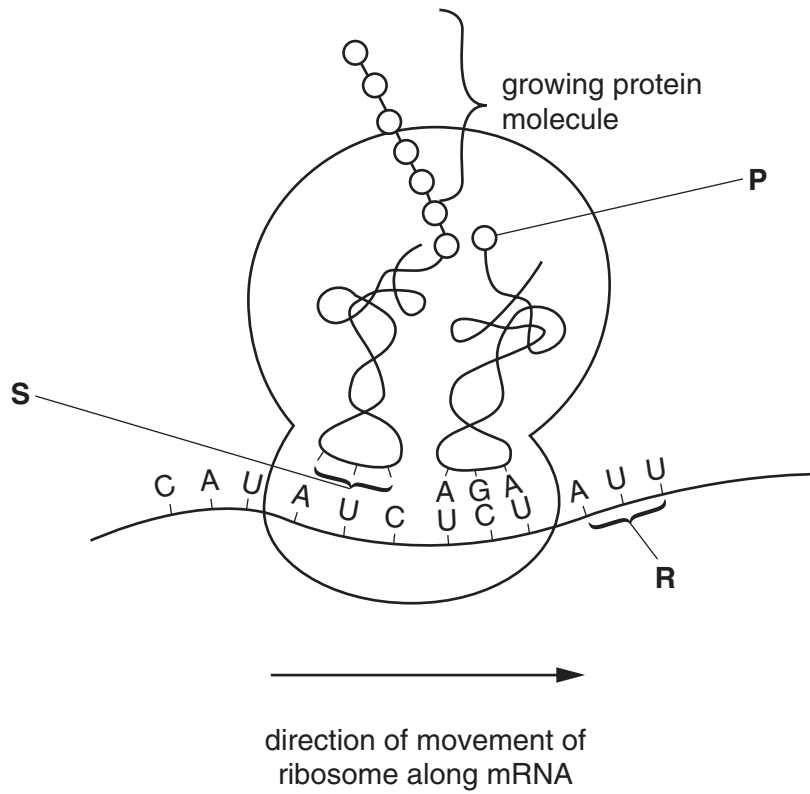


Fig. 4.1

Table 4.1 shows some triplet base sequences of mRNA and the amino acids for which they code.

Table 4.1

| mRNA | amino acid |
|------|---------------|
| AUU | isoleucine |
| AUC | isoleucine |
| AUG | methionine |
| UUU | phenylalanine |
| UCU | serine |
| CAU | histidine |

(a) With reference to Fig. 4.1 and Table 4.1,

(i) name the amino acid **P**;

.....[1]

(ii) state the base sequence at **S**;

.....[1]

(iii) state the name given to the triplet base sequences on mRNA;

.....[1]

(iv) describe the change that would occur to the protein if the base sequence at **R** was UUU instead of AUU.

.....
.....[1]

(b) Describe what happens to the enzyme molecule after it has left the ribosome until it leaves the cell.

.....
.....
.....
.....
.....[4]

[Total : 8]

5 Phagocytes are involved in removing bacteria from infected tissues.

Fig. 5.1 is a drawing made from an electron micrograph of a phagocyte that has engulfed some bacteria.

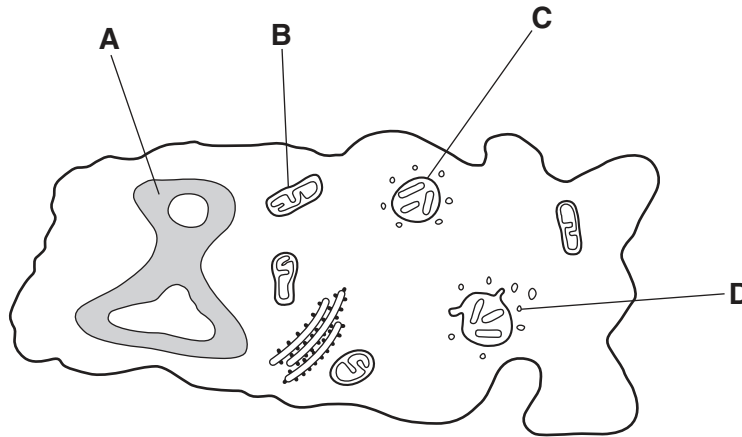


Fig. 5.1

(a) Name A to D.

- A
- B
- C
- D[2]

(b) Explain why it would not be possible to see the same detail of a phagocyte, as shown in Fig. 5.1, using a light microscope.

-
-
-
-[3]

(c) Explain how phagocytes engulf and destroy invading organisms, such as bacteria.

-
-
-
-
-[4]

[Total : 9]

- 6 (a) Complete Table 6.1 to show which of the four statements about the transmission and control of disease apply to cholera, malaria, HIV/AIDS and tuberculosis (TB). In each box, use a tick (✓) to show that the statement applies and a cross (✗) if it does not.

Table 6.1

| statement | cholera | malaria | HIV/AIDS | TB |
|-----------------------------------|---------|---------|----------|----|
| causative organism is a bacterium | | | | |
| causative organism is water-borne | | | | |
| transmitted by an insect vector | | | | |
| sexually transmitted | | | | |

[4]

- (b) Sickle cell anaemia is an inherited disease that is common in areas of the world where malaria is endemic.

Explain why sickle cell anaemia is common in areas where malaria is endemic.

.....

.....

.....

.....

.....

.....[3]

[Total : 7]

