Cambridge Assessment International Education

Cambridge International AS & A Level

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0893607962

BIOLOGY **9700/21**

Paper 2 AS Level Structured Questions **October/November 2020**

1 hour 15 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 60.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages. Blank pages are indicated.

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Answer **all** questions.

1 **(a)** Fig. 1.1 is a diagram of a human chromosome at a stage in mitosis.

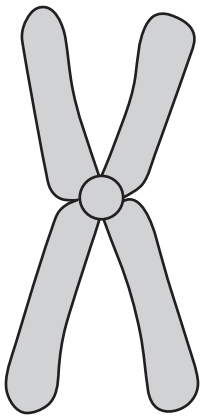


Fig. 1.1

(i) The paragraph describes the structure of the chromosome shown in Fig. 1.1.

Complete the paragraph using the most appropriate term in each space provided.

The chromosome shown in Fig. 1.1 has two genetically identical ..... joined at a ..... . The chromosome is composed of two DNA molecules, each wrapped around proteins known as ..... proteins.

[3]

(ii) State **one** stage during mitosis when the chromosome would appear as shown in Fig. 1.1.

..... [1]

(iii) Suggest the role of ATP in the process of mitosis.

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..... [2]

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(b) Prokaryotes divide by a process known as binary fission.

Fig. 1.2 shows some of the stages in binary fission.

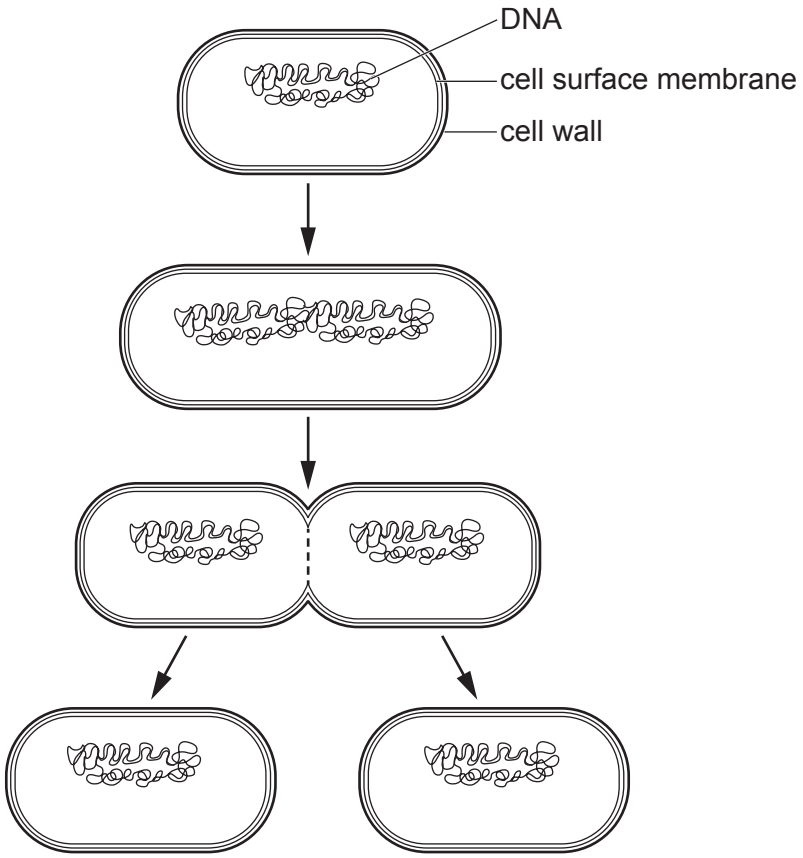


Fig. 1.2

With reference to Fig. 1.2, identify **two** events that occur during binary fission that do **not** occur during mitosis in human cells.

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..... [2]

[Total: 8]

2 **(a)** Fig. 2.1 shows the molecular structure of a triglyceride molecule.

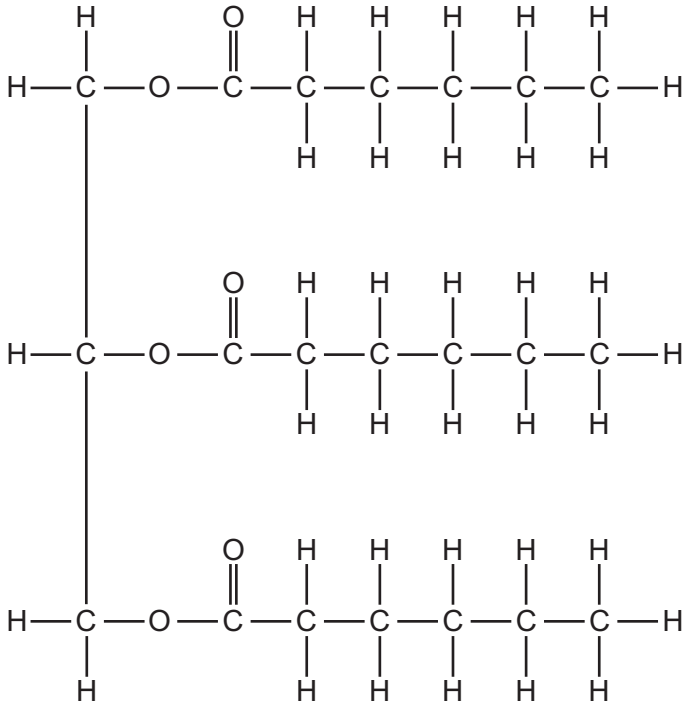


Fig. 2.1

(i) Draw a circle around an ester bond shown in Fig. 2.1. [1]

(ii) Name the type of reaction used to produce a triglyceride from its components.

State the number of water molecules produced during this reaction.

type of reaction .....

number of water molecules produced .....
[2]

BLANK PAGE

(b) Lipases are enzymes that digest triglycerides in the lumen of the human intestine. These enzymes are released by exocytosis from intestinal epithelial cells.

(i) Underline **all** the terms from the list that are used to describe these lipases.

macromolecule **extracellular enzyme** **fibrous protein** **polysaccharide**

[1]

Scientists have found that treating milk with lipase can improve its taste.

The scientists carried out an experiment to determine the effect of lipase activity on the triglycerides found in milk.

- Lipase was immobilised in alginate beads.
- The pH of a known volume of milk was adjusted to pH 8 by adding an alkali.
- The beads were then mixed with this milk in a beaker.
- The pH of the reaction mixture was recorded over a period of 24 hours.

The results are shown in Fig. 2.2.

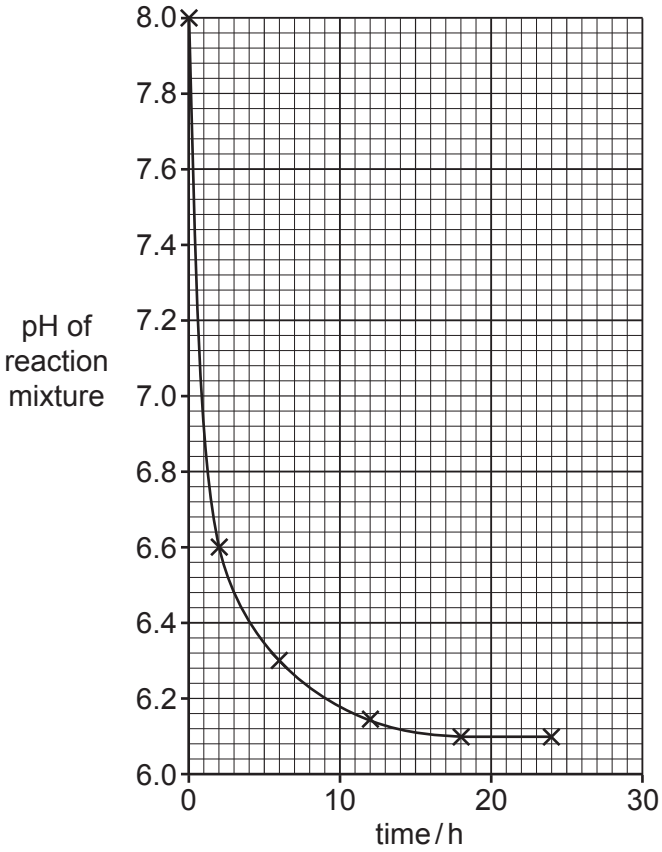


Fig. 2.2

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Fig. 2.2 shows that the pH decreases steeply and then, after 18 hours, remains constant.

(ii) Calculate the time taken for the pH to decrease from pH 6.6 to pH 6.3.

time taken = ... h [1]

(iii) Explain the results shown in Fig. 2.2.

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..... [4]

(iv) The scientists repeated the experiment using a higher concentration of lipase. All other variables remained constant.

Predict how an increase in the concentration of the lipase would affect the results of the experiment.

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..... [2]

[Total: 11]

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[Turn over

3 **(a)** The circulatory system of mammals is a double circulation.

(i) Explain what is meant by the term double circulation.

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..... [1]

(ii) Fig. 3.1 is a photograph showing one valve in the mammalian heart.

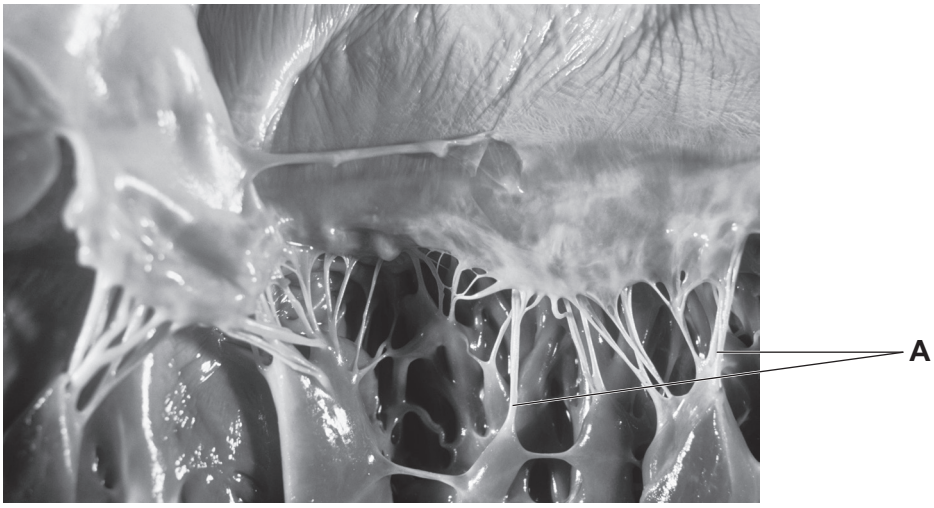


Fig. 3.1

Identify the structures labelled **A** in Fig. 3.1 **and** describe their role during the cardiac cycle.

structure **A** .....

role of structure **A**

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[3]

(b) The endocardium is a thin layer of tissue lining the chambers of the heart. A serious condition called endocarditis results if bacteria infect this tissue.

Endocarditis is treated with a combination of antibiotics. This increases the effectiveness of the treatment and reduces the risk of antibiotic resistance in bacteria.

Table 3.1 shows the action of two antibiotics used together to treat endocarditis.

Table 3.1

antibiotic used in treatment	action of antibiotic
gentamicin	binds permanently to the bacterial ribosomes
penicillin G	inhibits an enzyme involved in cell wall synthesis

(i) With reference to Table 3.1, explain why treating endocarditis with a combination of gentamicin and penicillin G reduces the risk of developing antibiotic resistance.

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..... [2]

(ii) Describe how the bacteria that cause endocarditis could become resistant to gentamicin.

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..... [3]

[Total: 9]

4 **(a)** Fig. 4.1 is a scanning electron micrograph of a section of a plant cell wall.

In living plant tissue cytoplasmic strands form part of structure **W**.

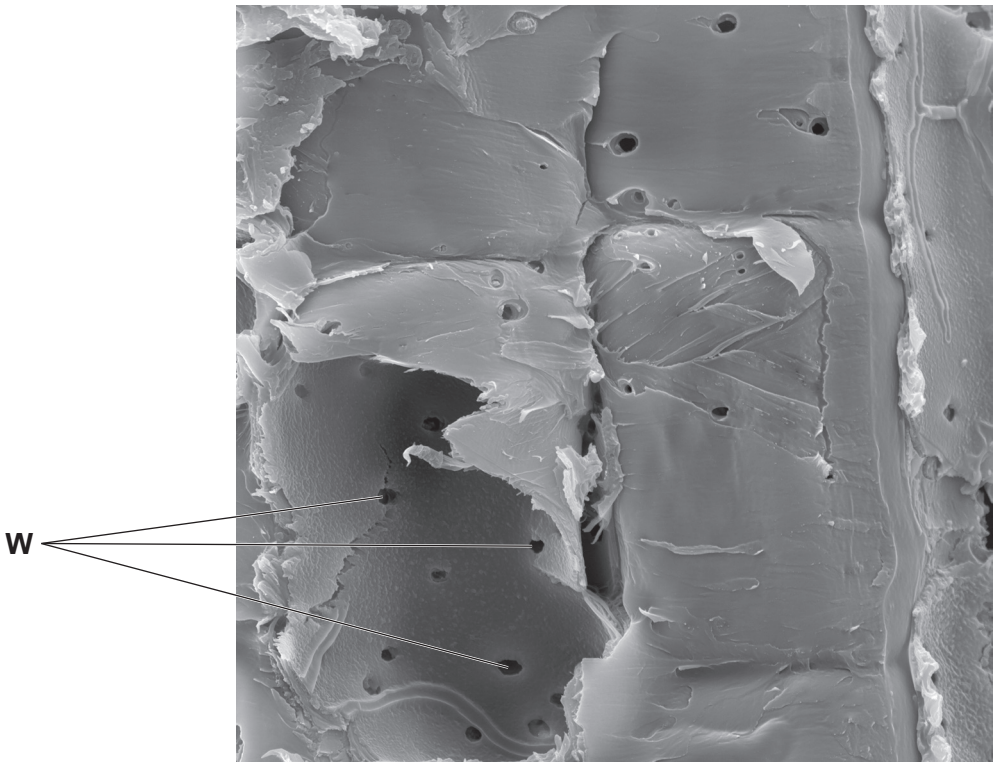


Fig. 4.1

(i) Identify the structures labelled **W** in Fig. 4.1.

..... [1]

(ii) Describe the function of structure **W**.

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..... [2]

(b) Viruses can infect plant cells.

(i) Outline the key structural features of a virus.

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..... [2]

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(ii) Many plant viruses can travel through the plant to enter companion cells in the phloem tissue. The viruses then travel with assimilates in the phloem sap to other areas of the plant.

Explain the mechanism that allows assimilates and viruses to travel through phloem sieve tubes to other areas of the plant.

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..... [5]

[Total: 10]

5 **(a)** Fig. 5.1 is a photomicrograph of a section through the lungs showing a bronchus and some alveoli.

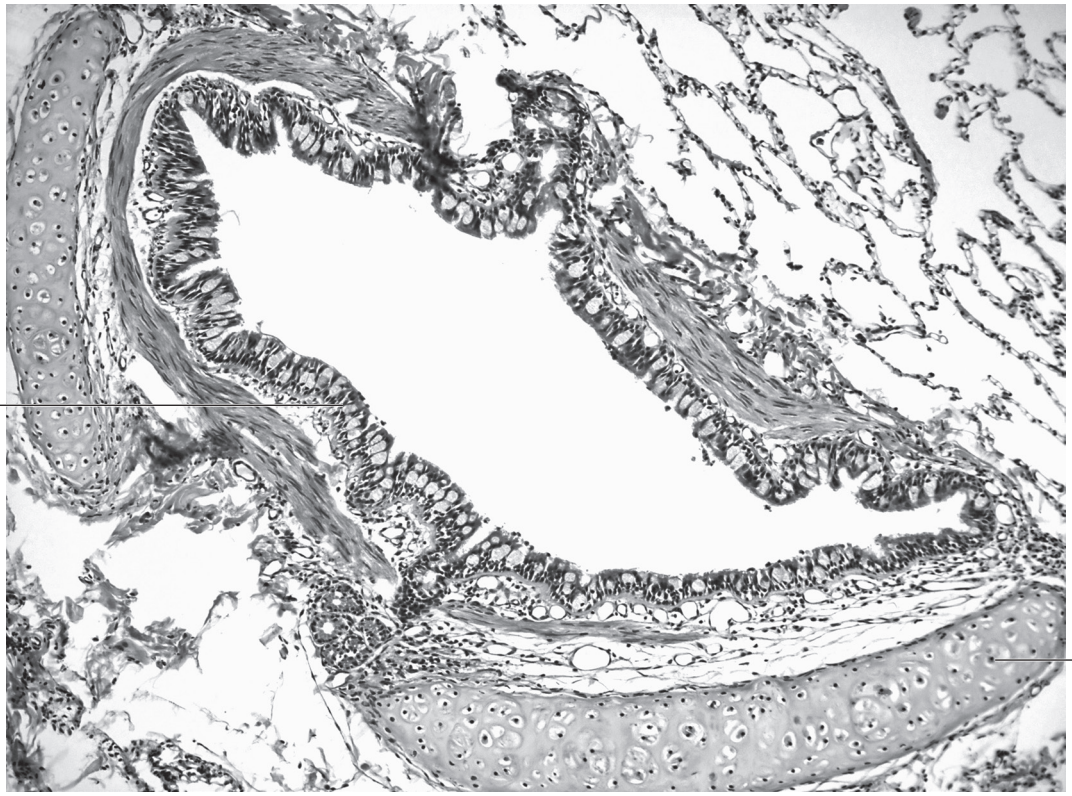


Fig. 5.1

(i) State the function of tissue **X** labelled in Fig. 5.1.

.....

..... [1]

(ii) Describe how the distribution of tissue **X** in the trachea differs from that shown in Fig. 5.1.

.....

..... [1]

(iii) Describe how the epithelial tissue, **Y**, is adapted for its function.

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..... [2]

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(b) Fig. 5.2 is a photograph of two African elephants, *Loxodonta africana*.



Fig. 5.2

(i) Describe the difference in surface area to volume ratio between the adult elephant and baby elephant shown in Fig. 5.2.

.....

..... [1]

(ii) Suggest why animals such as elephants require a gas exchange system.

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..... [3]

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[Turn over

(iii) The feet of elephants are protected by structures under the skin known as cushions. The cushions are made up of a large number of cells surrounded by connective tissue containing many fibres of collagen. The fibres help to maintain the structure of the cushion.

The collagen fibres are made of collagen molecules.

Describe the structure of a **collagen molecule**.

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..... [4]

(iv) The cushion in the foot is very strong and is able to resist extremely large forces acting on it due to the large mass of the elephant.

Suggest how the structure of a **collagen fibre** can help the cushion resist these large forces.

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..... [1]

[Total: 13]

6 **(a)** Mutations in body cells can sometimes result in a tumour. Some tumours are cancerous.

(i) Outline how mutations can result in the development of a tumour.

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..... [2]

(ii) Tumour cells have antigens on their cell surface that are not present on non-tumour cells.

These antigens are the result of gene mutations and are known as tumour specific antigens (TSA).

One type of TSA differs in structure from the protein found on the cell surface of non-tumour cells by a single amino acid.

Explain how a gene mutation could result in the production of this TSA.

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..... [2]

Question 6 continues on page 16

(b) Immunotherapy is a form of treatment for cancer which aims to stimulate the immune system to destroy tumour cells.

One form of immunotherapy for cancer uses a vaccine which contains one specific type of TSA.

(i) Describe how vaccination with a specific type of TSA could lead to the destruction of tumour cells by T-lymphocytes in the body.

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..... [3]

(ii) Vaccines that contain tumour cells instead of a TSA are being developed for use during immunotherapy. Tumour cells are removed from a patient's body and used in a vaccine for the patient.

Suggest **one** advantage and **one** disadvantage of using a patient's tumour cells in a vaccine rather than a TSA.

advantage .....

.....

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disadvantage .....

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[2]

[Total: 9]

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2295025156

BIOLOGY **9700/22**

Paper 2 AS Level Structured Questions **October/November 2020**

1 hour 15 minutes

You must answer on the question paper.

No additional materials are needed.

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INFORMATION

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[Turn over

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Answer **all** questions.

1 Fig. 1.1 is a diagram drawn from a photomicrograph of a transverse section through part of a leaf.

The arrows in Fig. 1.1 show the movement of water through the cells of the leaf after it has left the xylem.

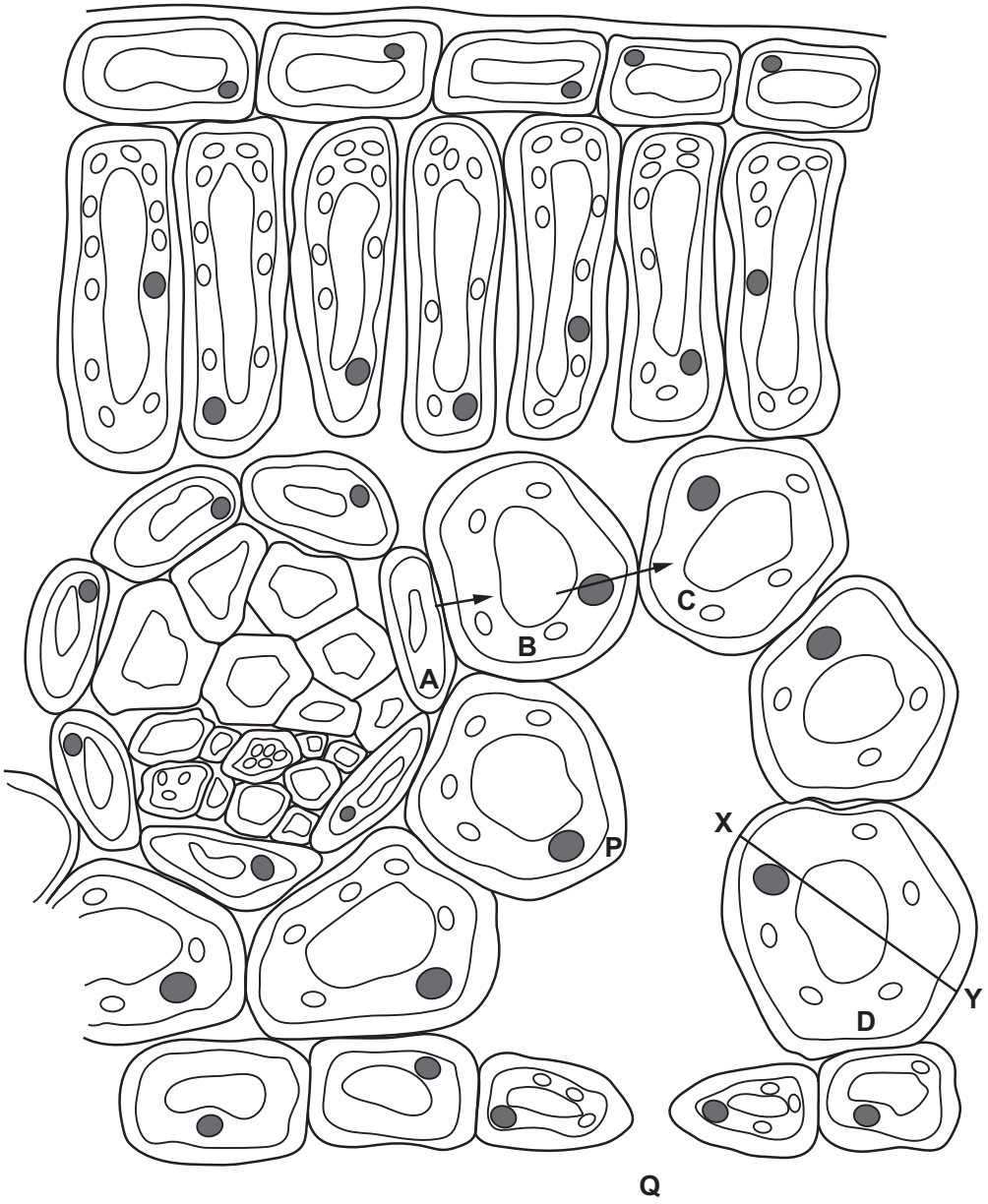


Fig. 1.1

(a) Water from the xylem can enter cell **A** and then moves to cells **B** and **C** without crossing their cell walls.

The cell structures through which water passes from cell **A** to cell **B** are **not** visible in Fig. 1.1.

(i) Name the cell structures through which water passes from cell **A** to cell **B** without crossing their cell walls.

..... [1]

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(ii) Explain what causes water to move from cell **B** to cell **C**.

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..... [1]

(iii) Name the pathway taken by water between cell **A** and cell **C**.

..... [1]

(b) Most of the water that arrives at the leaf passes to the external atmosphere.

With reference to Fig. 1.1, describe **and** explain the sequence of events occurring between point **P** and point **Q**.

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..... [4]

(c) The actual diameter of cell **D** in Fig. 1.1 along the length **X**–**Y** is 25 μm.

Calculate the magnification of the image.

Write down the formula used to make your calculation. Show your working.

formula

answer = × ..... [3]

[Total: 10]

PapaCambridge

2 The treatment for people with active tuberculosis (TB) lasts six months and involves a combination of antibiotics. This is usually very effective if the person has a susceptible (non-resistant) strain of *Mycobacterium tuberculosis*, the causative organism of TB.

Table 2.1 summarises one recommended treatment strategy that involves a combination of antibiotics.

Table 2.1

antibiotic	length of treatment	mode of action of antibiotic
rifampicin (R)	6 months	enters bacterial cells and inhibits protein synthesis
isoniazid (H)	6 months	prevents the synthesis of cell wall components known as mycolic acids
ethambutol (E)	first two months	prevents mycolic acids from being added to the cell wall
pyrazinamide (Z)	first two months	prevents the synthesis of fatty acids

(a) Susceptible strains of *M. tuberculosis* will be killed using any one of the antibiotics listed in Table 2.1. However, combination treatment is preferred as it is one method that can be used to reduce the impact to society of antibiotic resistance.

With reference to Table 2.1, explain how combination treatment for TB can help to reduce the impact of antibiotic resistance compared to single antibiotic treatment.

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..... [4]

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Rifampicin binds tightly to an RNA polymerase molecule close to its active site. This affects the activity of the enzyme.

(b) (i) RNA polymerase catalyses the formation of messenger RNA (mRNA) from DNA.

State the term for this process.

..... [1]

(ii) During the formation of RNA, a number of events occur that involve the action of RNA polymerase.

Suggest ways in which rifampicin can affect the activity of RNA polymerase.

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..... [3]

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(c) RNA polymerase is composed of five different polypeptides. Gene *rpoB* codes for one of these polypeptides known as the β-subunit.

One or more mutations in a specific region of *rpoB* result in strains of *M. tuberculosis* that are resistant to rifampicin. In these strains, mutations often occur in two DNA triplets in this region, in positions 526 and 531.

Table 2.2 summarises the results of an investigation into seven rifampicin-resistant strains, **A** to **G**, that have amino acid changes for positions 526 and 531.

Table 2.2 includes:

- the change in the **mRNA codon** for position 526 or position 531
- the amino acid change that has occurred as a result of the mutation
- the minimum concentration of rifampicin required to inhibit growth of the bacterial strain (MIC)
- the number of **other** mutations occurring within the specific region of *rpoB*.

Table 2.2

Key
≈ approximately ⩾ greater than or equal to ⩽ less than or equal to

strain	codon involved	mRNA codon change	amino acid change	MIC / $\mu g\,cm^{-3}$	number of other mutations in the specific region
A	526	CAC ⟶ UAC	His ⟶ Tyr	⩽50	0
B	526	CAC ⟶ AAC	His ⟶ Asn	⩾100	1
C	526	CAC ⟶ CGC	His ⟶ Arg	≈50–75	2
D	526	CAC ⟶ CGC	His ⟶ Arg	⩾100	3
E	526	CAC ⟶ CGC	His ⟶ Arg	≈50	3
F	526	CAC ⟶ UUC	His ⟶	⩾100	3
	531	UCG ⟶ UUG	Ser ⟶ Leu		
G	526	CAC ⟶ UAC	His ⟶	⩾100	3
	531	UCG ⟶ UUC	Ser ⟶ Phe		

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(i) Complete Table 2.2 to show the amino acid changes that have occurred in strains **F** and **G**.

[1]

(ii) With reference to Table 2.2, list the strains of *M. tuberculosis* that show the greatest resistance to rifampicin.

..... [1]

(iii) Suggest reasons to explain why strains **C**, **D** and **E** show:

- resistance to rifampicin
- different levels of resistances to rifampicin.

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..... [3]

[Total: 13]

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3 Fig. 3.1 is a photomicrograph of a section through lung tissue.

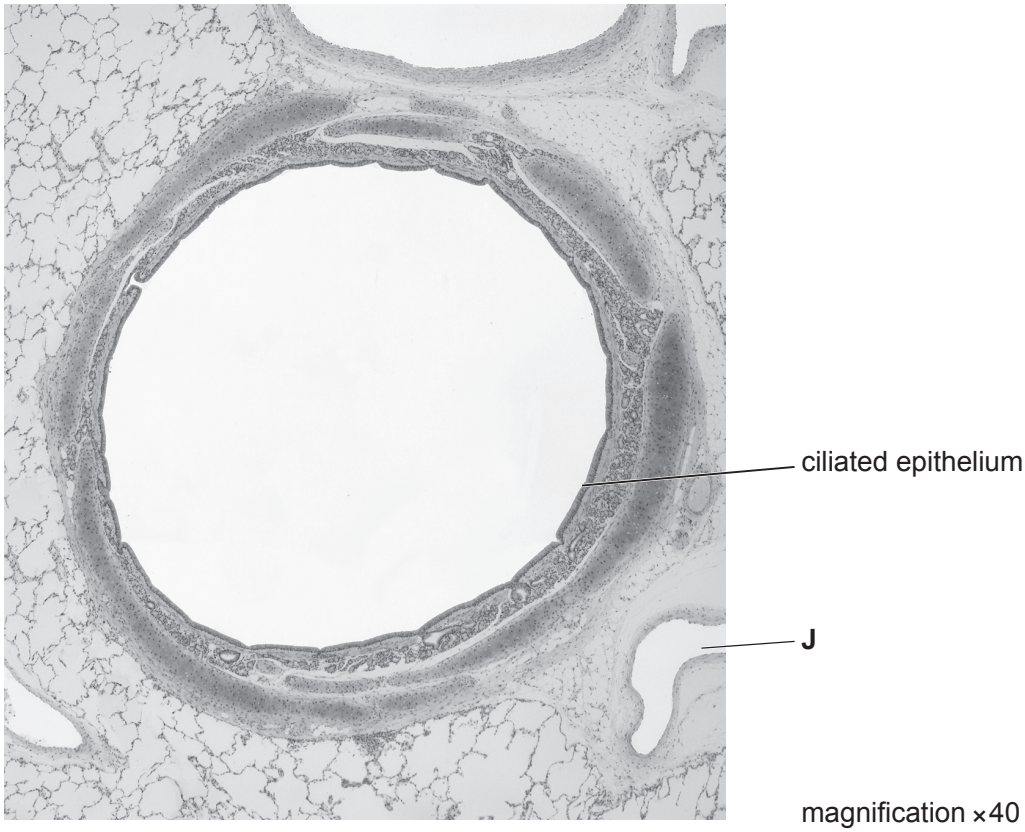


Fig. 3.1

(a) State the feature visible in Fig. 3.1 that identifies the structure in the centre of the image as the bronchus **and** list other visible features that help to confirm this identification.

feature to identify the bronchus .....

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other features .....

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[3]

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(b) Identify the structure labelled **J** in Fig. 3.1.

State the evidence visible in Fig. 3.1 that supports your answer.

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..... [2]

(c) The ciliated epithelium labelled in Fig. 3.1 consists of goblet cells and ciliated epithelial cells.

Outline how goblet cells and cilia work together to maintain healthy lung tissue.

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..... [2]

[Total: 7]

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4 In the immune system, a plasma cell develops from an activated B-lymphocyte. Mature plasma cells synthesise and secrete antibody molecules.

(a) Fig. 4.1 is a diagram of a transmission electron micrograph of a plasma cell.

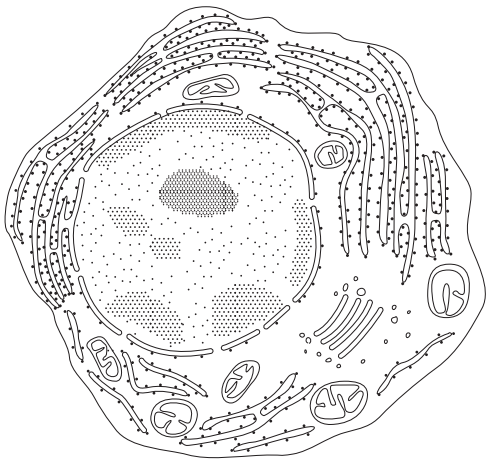


Fig. 4.1

The plasma cell can be seen in greater detail using an electron microscope compared with using a light microscope.

(i) Describe the **extra** detail of the nucleus that can be seen using an electron microscope.

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..... [3]

(ii) Explain why cell structures, such as ribosomes and the rough and smooth endoplasmic reticulum, cannot be seen using a light microscope.

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..... [2]

PapaCambridge

(b) The transition from the activated B-lymphocyte to the fully mature plasma cell requires a number of mitotic cell cycles to occur. This process, which is known as clonal expansion, results in a large number of genetically identical plasma cells.

Fig. 4.2 describes events, **A** to **F**, that occur during the mitotic cell cycle of the B-lymphocyte.

A centrioles replicate
B DNA polymerase catalyses the formation of phosphodiester bonds
C condensation of chromosomes
D nuclear envelope reassembles around each set of daughter chromosomes
E centromeres move towards poles
F chromosomes line up at spindle equator

Fig. 4.2

Table 4.1 lists the stages occurring during one cell cycle of the B-lymphocyte. These stages are not in the correct order.

Table 4.1

stage of cell cycle	**correct letter from Fig. 4.2**
G_2 phase	
metaphase	**F**
cytokinesis	
prophase	
S phase	
anaphase	
G_1 phase	
telophase	

Complete Table 4.1 by writing the letter of the event described in Fig. 4.2 that correctly matches the stage of the cell cycle listed.

Leave a **blank space** if there is **no** matching description for the stage in the list. Use each letter **once** only.

One of the letters in Table 4.1 has already been added for you.

[5]

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[Turn over

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(c) Clonal expansion also results in the production of memory B-lymphocytes.

Explain the importance of clonal expansion **and** the production of memory B-lymphocytes in providing protection for a person against an infectious disease.

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..... [3]

(d) Myasthenia gravis is an example of a disease where the immune system fails to distinguish between self and non-self.

Explain what is meant by this statement.

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..... [2]

[Total: 15]

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5 Sucrose phosphorylase is an enzyme found in some species of bacteria. One function of this enzyme is for the production of compounds that help to protect the cell from harmful osmotic changes in the external environment.

Fig. 5.1 shows the reversible reaction that takes place within the bacterial cell.

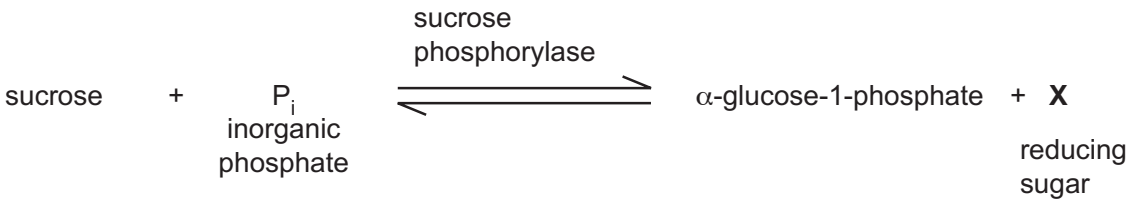


Fig. 5.1

(a) Name reducing sugar **X** in Fig. 5.1.

..... [1]

(b) In the absence of sucrose phosphorylase as a catalyst, the reaction shown in Fig. 5.1 would take too long to occur to allow the bacterial cell to function efficiently.

Explain why the reaction shown in Fig. 5.1 proceeds at a much faster rate in the presence of the enzyme.

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..... [2]

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[Turn over

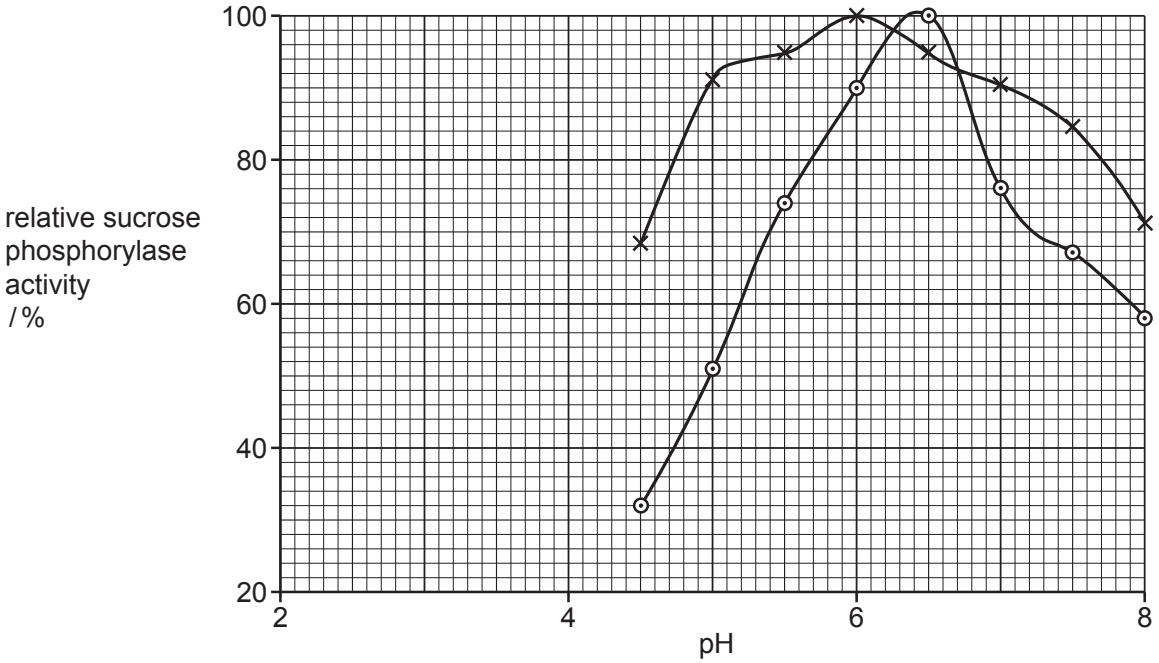
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(c) An enzyme that catalyses a reaction of commercial interest needs to be investigated to see if it is suitable for use in industry.
For example:

- immobilised enzymes may be used as they have a longer shelf-life than the enzyme free in solution
- many industrial reactions are carried out at higher temperatures to minimise contamination of products by microorganisms.

Fig. 5.2 shows the results of an investigation to compare the activity of sucrose phosphorylase free in solution (free enzyme) with immobilised sucrose phosphorylase (immobilised enzyme) at different pHs.

Fig. 5.3 shows the activity of the free enzyme and immobilised enzyme at different temperatures.

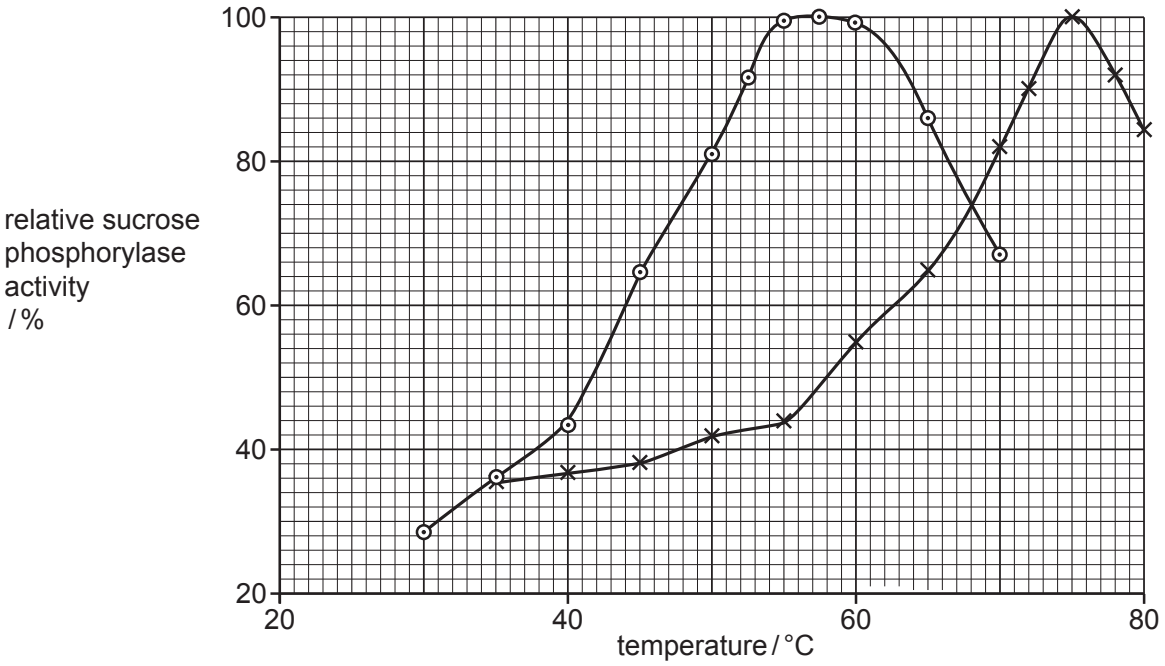


Key

⊙ free enzyme
× immobilised enzyme

Fig. 5.2

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Key

⊙ free enzyme

× immobilised enzyme

Fig. 5.3

With reference to the results shown in Fig. 5.2 and Fig. 5.3, discuss which sucrose phosphorylase enzyme, free or immobilised, is better for use in industrial reactions.

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..... [4]

[Total: 7]

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6 **(a)** Fig. 6.1 shows an oxygen dissociation curve for adult human haemoglobin.

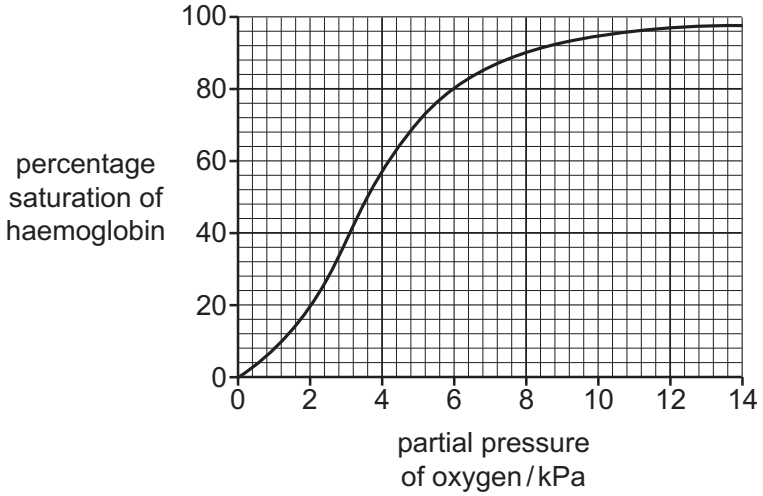


Fig. 6.1

An increase in the partial pressure of carbon dioxide (pCO_2) in respiring tissue causes the Bohr effect.

(i) Sketch on Fig. 6.1 to show how the Bohr effect changes the oxygen dissociation curve. [1]

(ii) Explain how an increase in pCO_2 produces the Bohr effect **and** state the benefit of this effect for the tissue.

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..... [3]

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(b) Carbon dioxide (CO_2) is transported across the cell surface membrane of the red blood cell using a different mechanism to the transport of hydrogen carbonate ions (HCO_3^-).

Name the different mechanisms of transport used for CO_2 and for HCO_3^- **and** explain why they are transported across the membrane by different mechanisms.

CO_2 .....

HCO_3^- .....

explanation .....

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.....

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[4]

[Total: 8]

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1190302152

BIOLOGY **9700/23**

Paper 2 AS Level Structured Questions **October/November 2020**

1 hour 15 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 60.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages. Blank pages are indicated.

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Answer **all** questions.

1 Fig. 1.1 shows a section through the human chest. The gross structure of the human gas exchange system is shown.

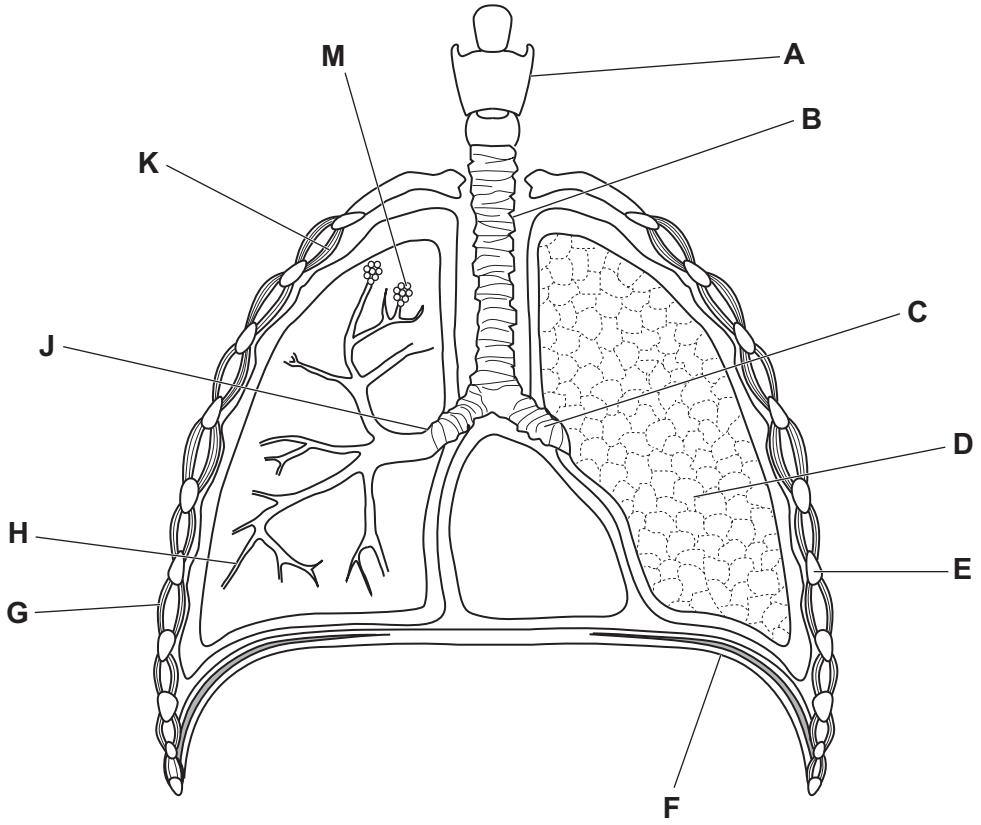


Fig. 1.1

(a) Descriptions of some parts of the gas exchange system are shown in Table 1.1.

Complete Table 1.1 to:

- state the name of the part described
- write a letter from Fig. 1.1 to identify each part.

Table 1.1

description	name of part of gas exchange system	letter from Fig. 1.1
supported by incomplete (C-shaped) rings of cartilage		
lined by ciliated epithelium and supported by blocks of cartilage		
lined by squamous epithelium		
lined by ciliated epithelium, but not supported by cartilage		

[4]

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(b) Tobacco smoke contains a number of compounds which can affect the body.

State the appropriate term that matches each of the statements **A** to **E**.

A The type of chemical that causes mutation of genes that control the cell cycle.

.....

B A component that causes a short-term increase in blood pressure.

.....

C A component that reduces the carrying capacity of haemoglobin for oxygen.

.....

D A component that increases the production and secretion of mucus from goblet cells.

.....

E A component that causes a short-term increase in heart rate.

.....

[5]

[Total: 9]

2 The veins of a leaf contain transport tissues. Fig. 2.1 is a drawing made from an electron micrograph showing a cross-section of the transport tissue in a leaf vein.

The cells labelled **A** are modified companion cells, known as phloem transfer cells. Transfer cells move sucrose and other assimilates from mesophyll cells, **B**, into the phloem sieve tube element, **C**.

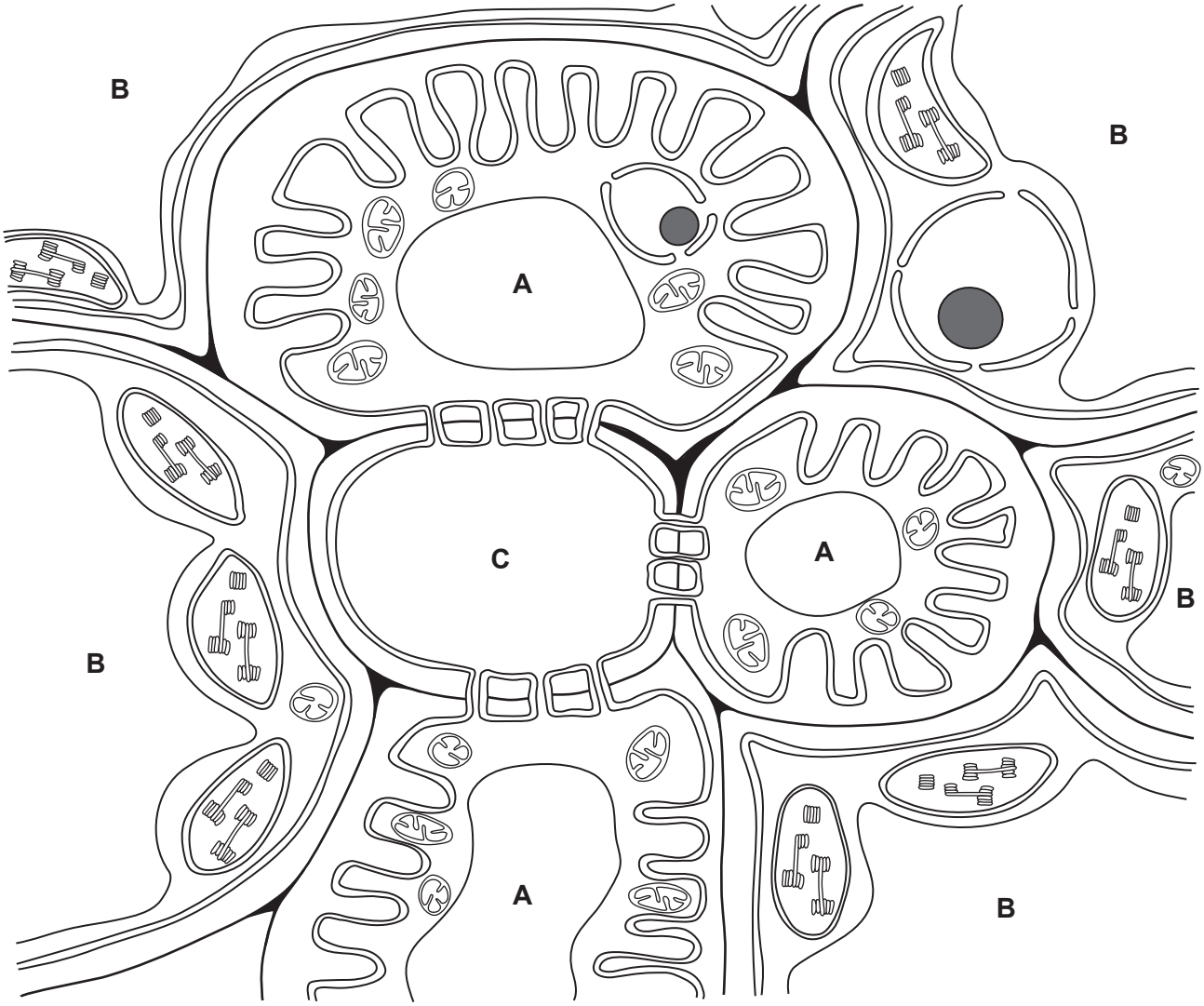


Fig. 2.1

(a) State the functions of the mesophyll cells, **B**, and sieve tube element, **C**, **and** explain how their structure is adapted for their function.

cell **B** – function .....

adaptation .....

.....

.....

.....

cell **C** – function .....

adaptation .....

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[5]

(b) The cell walls of the transfer cells, **A**, shown in Fig. 2.1, have infoldings.

Explain the advantages of these cell wall infoldings for the movement of sucrose from mesophyll cells to phloem sieve tubes.

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[Total: 8]

3 Fig. 3.1 shows the nematode worm, *Caenorhabditis elegans*.



magnification ×250

Fig. 3.1

Stem cells of *C. elegans* have been studied.

Fig. 3.2 shows the change in mass of DNA per nucleus in a stem cell during one cell cycle.

$1\,pg = 1 \times 10^{-12}\,g$

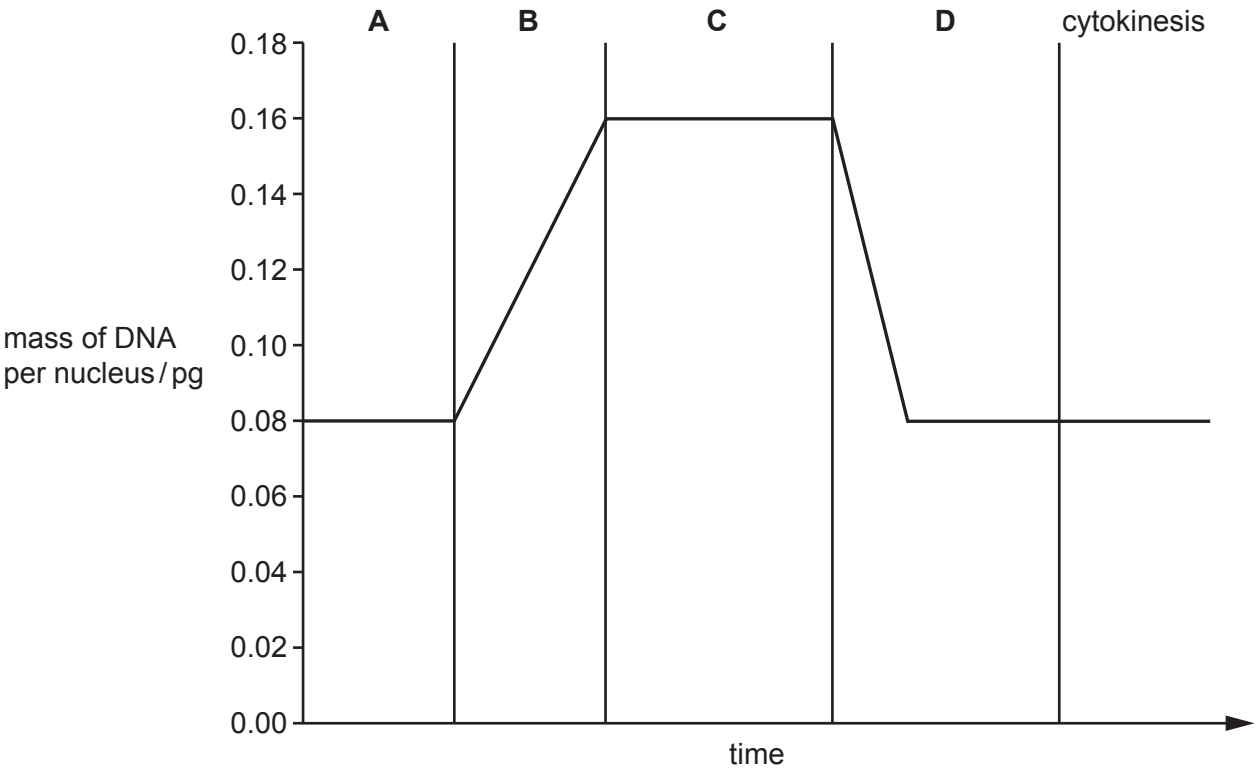


Fig. 3.2

(a) (i) State the phases of interphase shown by **A** and **B** in Fig. 3.2.

A .....

B .....

[2]

(ii) State the stage of mitosis shown by **D** in Fig. 3.2.

..... [1]

(iii) Outline what happens in a cell in preparation for cytokinesis.

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..... [2]

(iv) A stem cell of a female *C. elegans* has 12 chromosomes.

Complete Table 3.1 to show the number of nuclei within the stem cell in stages **A**, **B** and **D** of the cell cycle shown in Fig. 3.2 **and** the number of chromosomes in each nucleus during these stages.

Table 3.1

	stage of the cell cycle		
	A	**B**	**D**
number of nuclei within the stem cell			
number of chromosomes in each nucleus			

[2]

(b) Young nematodes have stem cells throughout the body.

Fig. 3.3 summarises three cell cycles of one of these stem cells.

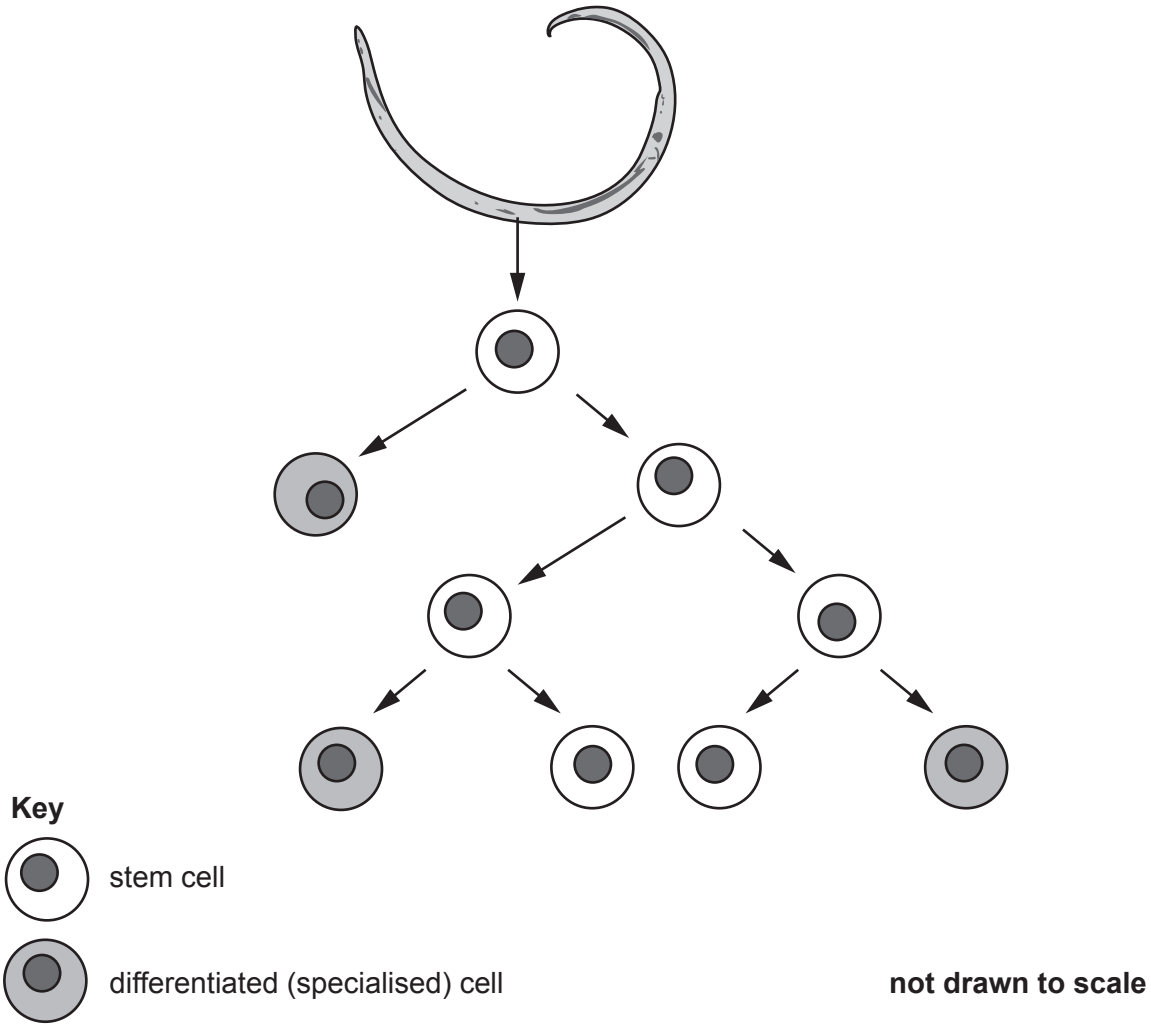


Fig. 3.3

With reference to Fig. 3.3, outline the role of stem cells in animals.

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[Total: 10]

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4 Antibiotic sensitivity tests can be carried out to choose appropriate antibiotics to use for treatment of bacterial diseases.

A researcher carried out an antibiotic sensitivity test using two pathogenic bacteria, **X** and **Y**.

The researcher prepared two Petri dishes containing agar.

- A culture of each bacterium was spread over the surface of the agar.
- Filter paper discs containing antibiotics were placed on the surface of the agar in each dish.
- The Petri dishes were incubated at 25 °C for two days.

The results of the test using three antibiotics, **P**, **Q** and **R**, are shown in Fig. 4.1.

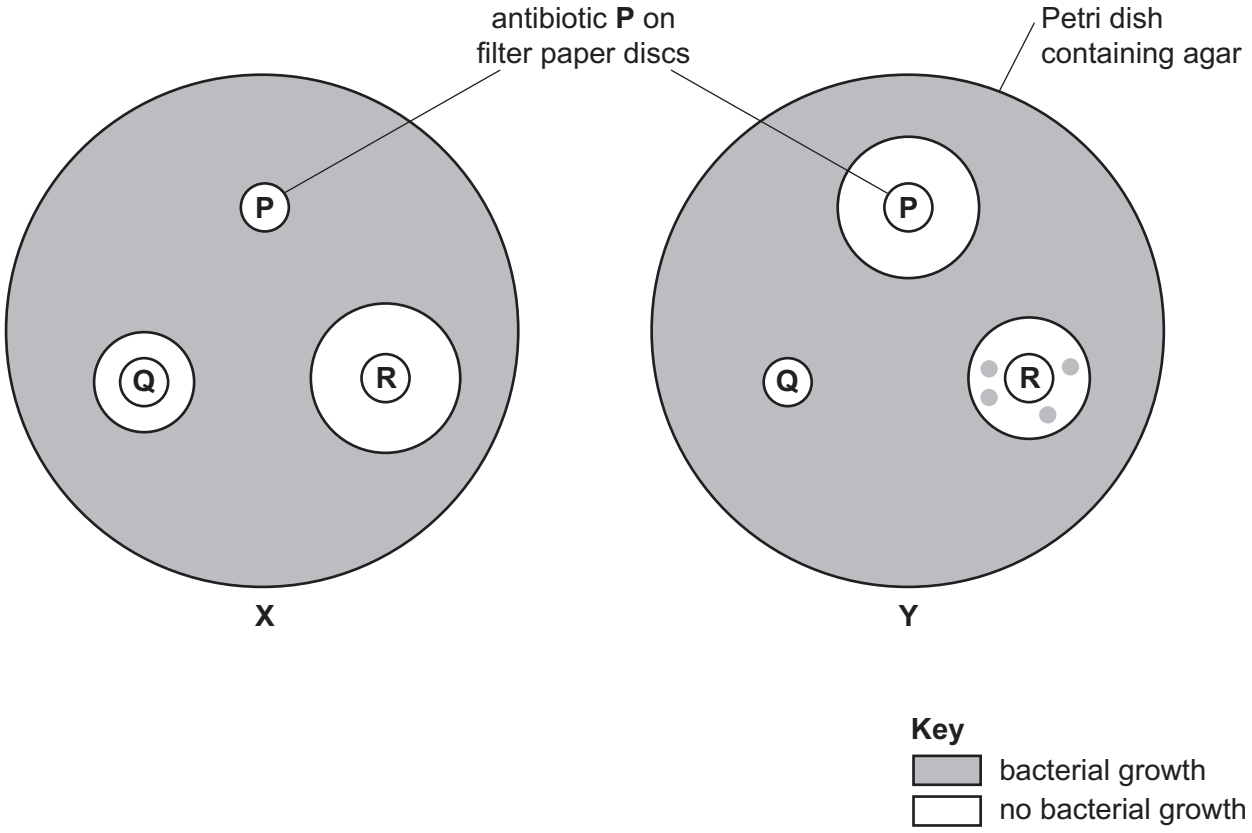


Fig. 4.1

(a) (i) State the most effective antibiotic to treat infections of bacterium **X** and bacterium **Y**.

bacterium **X** .....

bacterium **Y** .....

[1]

(ii) Suggest why bacterium **Y** had a different sensitivity to each of the three antibiotics.

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(b) Explain how the use of vaccines in the control of infectious diseases differs from the use of antibiotics.

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[Total: 6]

5 A molecule of collagen consists of three identical polypeptides that form a triple helix.

The amino acid glycine forms one third of the amino acids in a collagen molecule.

Fig. 5.1**A** shows a polypeptide molecule during protein synthesis. A molecule of glycine is shown just before it is added to the polypeptide.

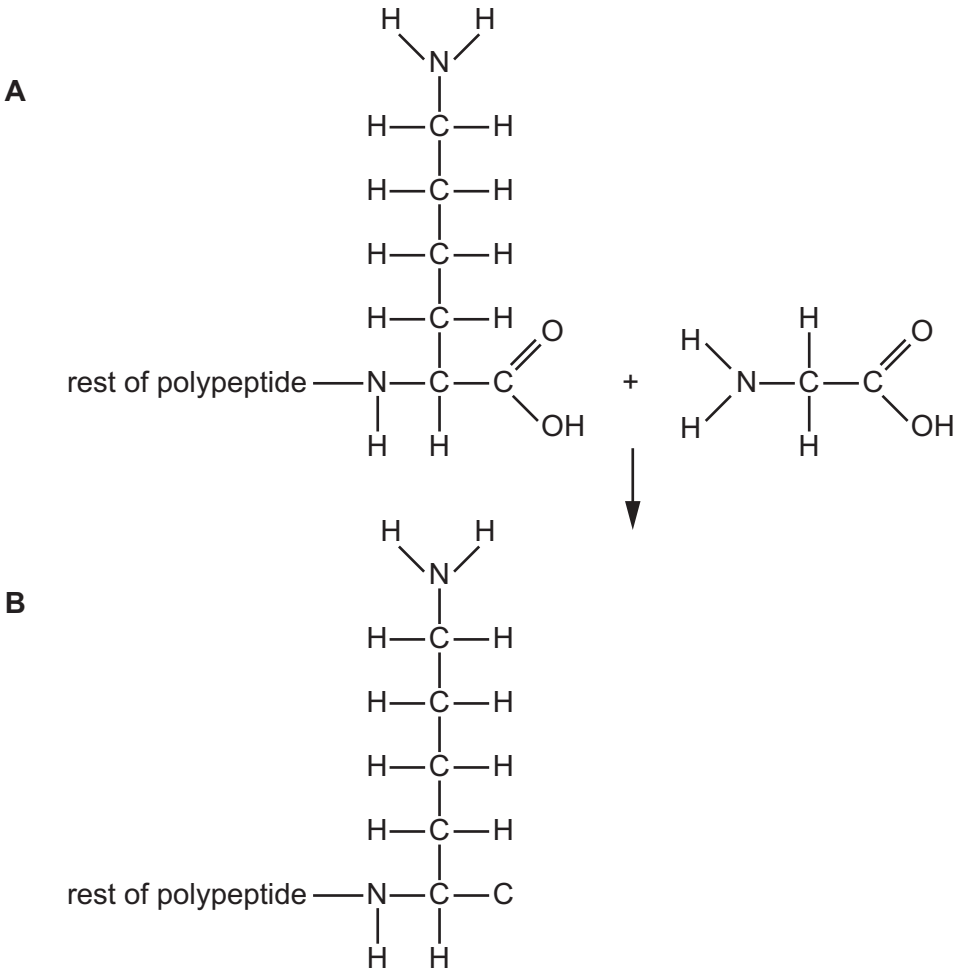


Fig. 5.1

(a) (i) Complete Fig. 5.1**B** to show the molecule of glycine added to the end of the polypeptide. [2]

(ii) State the type of reaction that occurs when glycine is added to the end of the polypeptide.

..... [1]

(iii) Explain the importance of glycine in a collagen molecule.

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..... [2]

(b) Collagen is a fibrous protein.

Explain how the structure of collagen is related to its functions within the mammalian body.

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(c) The enzyme collagenase catalyses the breakdown of collagen molecules. This enzyme acts by using an induced fit mechanism.

Describe the mode of action of collagenase.

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..... [5]

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(d) Students investigated the effect of pH on the activity of collagenase extracted from the bacterium *Bacillus licheniformis* at 50 °C.

The results are shown in Fig. 5.2.

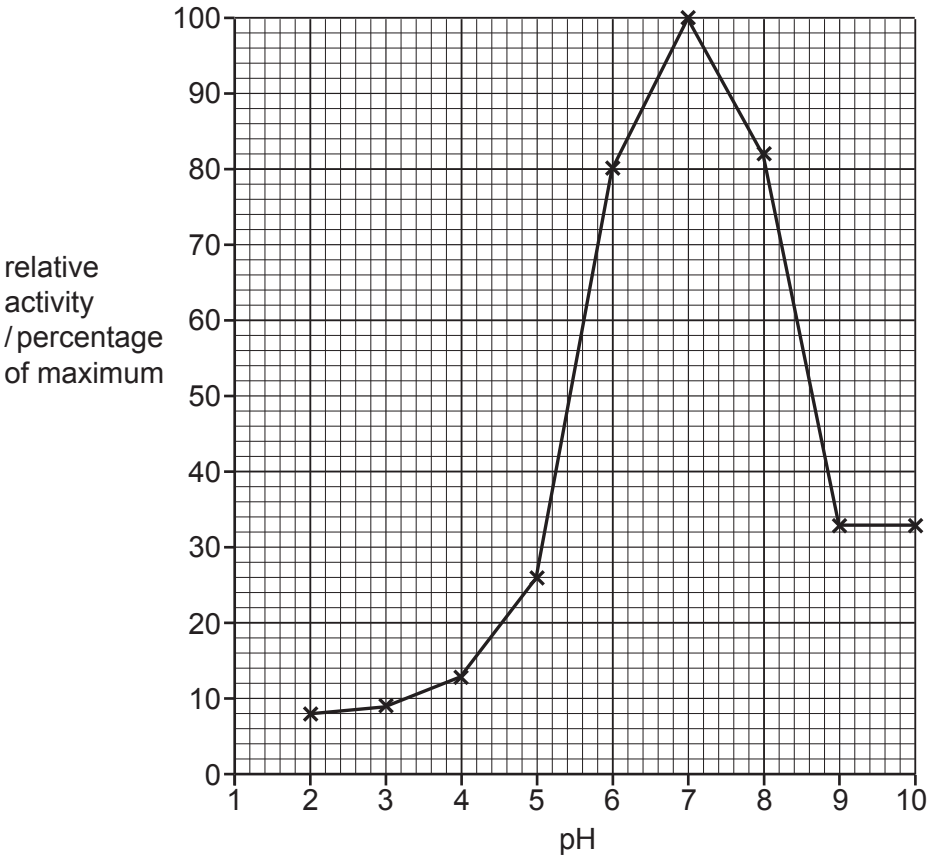


Fig. 5.2

With reference to Fig. 5.2, describe **and** explain the effect of pH on the activity of collagenase.

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[Total: 18]

6 **(a)** Fig. 6.1 shows *Vorticella*, which is a single-celled organism that lives in freshwater. *Vorticella* has many cilia which it uses for feeding.

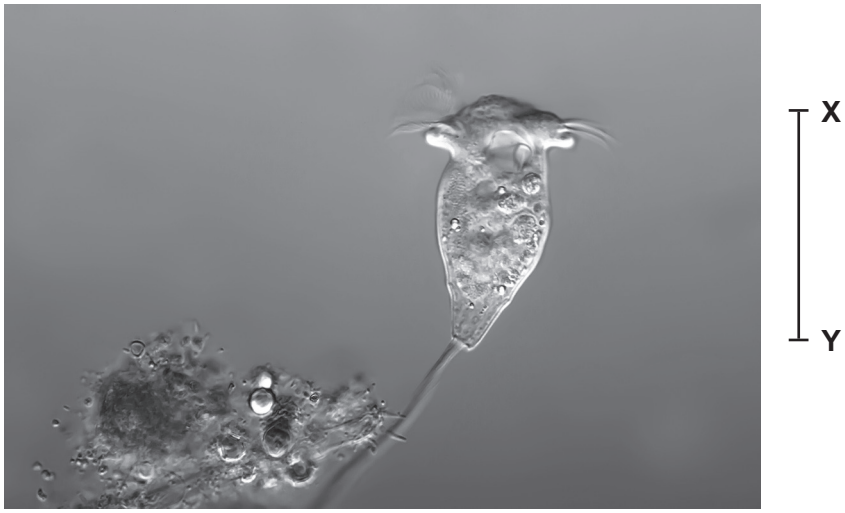


Fig. 6.1

The distance shown by **X**–**Y** on Fig. 6.1 is 150 μm.

Calculate the magnification of Fig. 6.1.

State the formula that you will use and show your working.

Write your answer to the nearest whole number.

formula

..... [3]

(b) The food particles are taken into the gullet by a current of water created by movement of cilia.

Any particles suspended in the water, such as bacteria, are taken into the cell as shown in Fig. 6.2.

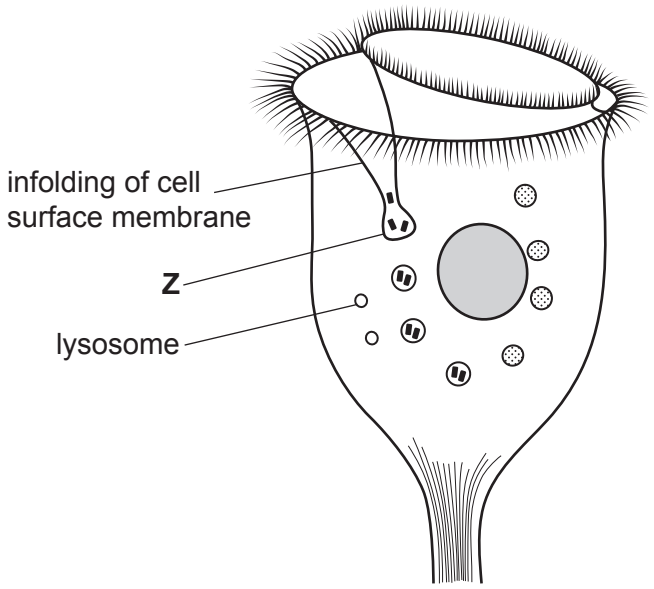


Fig. 6.2

(i) State the name of the process which takes the bacteria into the cell at **Z and** describe the way in which it occurs.

name .....

description .....

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.....

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[3]

(ii) Describe the role of lysosomes in intracellular digestion in *Vorticella*.

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..... [3]

[Total: 9]

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