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CAMBRIDGE
International Education

Cambridge International AS & A Level

BIOLOGY **9700/11**

Paper 1 Multiple Choice **May/June 2026**

1 hour 15 minutes

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS

- There are **forty** questions on this paper. Answer **all** questions.
- For each question there are four possible answers **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid or tape.
- Do **not** write on any bar codes.
- You may use a calculator.

INFORMATION

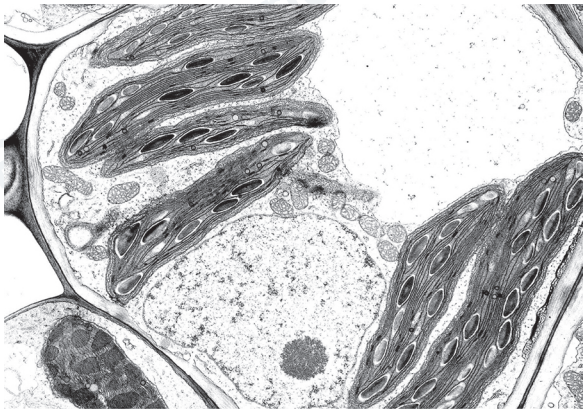
- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.

This document has **20** pages. Any blank pages are indicated.

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1 The photomicrograph shows some mesophyll tissue from a dicotyledonous leaf.



What is the magnification of the photomicrograph?

A ×280 **B** ×2800 **C** ×3570 **D** ×7000

2 A student prepared a microscope slide of onion tissue by:

- using forceps to remove a single layer of cells from the inside of a section of onion
- placing the sample on a microscope slide so it was flat and **not** folded on itself
- adding a few drops of iodine solution
- removing excess iodine solution using a tissue
- placing the slide on the stage of a light microscope and viewing it with a ×10 objective lens and then a ×40 objective lens.

Which problems may occur with this method?

1 The onion tissue may dry out over time, damaging the cells.

2 It is **not** possible to observe the nuclei of the onion cells.

3 The onion tissue is too thick to allow light to penetrate through it.

4 The onion tissue may leave a stain on the lens if the lens is lowered too close.

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

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3 The photomicrograph shows a fruit fly, *Drosophila melanogaster*, viewed with a light microscope.



×50

The fruit fly was then examined with a scanning electron microscope. The length of the head was the same size in the scanning electron micrograph as it was in the photomicrograph.

Which statement describes why the scanning electron micrograph has a more detailed surface view of the fruit fly?

A The scanning electron micrograph has a higher magnification and the same resolution as the photomicrograph.

B The scanning electron micrograph has a higher magnification and a higher resolution than the photomicrograph.

C The scanning electron micrograph has the same magnification and a lower resolution than the photomicrograph.

D The scanning electron micrograph has the same magnification and a higher resolution than the photomicrograph.

4 The removal of a plant cell wall by enzyme digestion leaves an intact membrane-bound structure called a protoplast.

Which statement explains why protoplasts are easily damaged?

A Mitochondria stop producing ATP to maintain membrane integrity.

B Net movement of water is no longer limited by turgor.

C Secretory vesicles are unable to fuse with the cell surface membrane.

D The shape of the cell structures is changed by the loss of cell shape.

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5 The table shows three locations in different types of cell.

Which row shows the correct type of ribosomes present in these locations?

	cytoplasm of *Vibrio cholerae*	**mitochondrion of liver cell**	**chloroplast of guard cell**
A	70S	70S	70S
B	70S	80S	80S
C	80S	70S	70S
D	80S	80S	80S

6 Which molecules are found in bacteria?

1 DNA

2 RNA

3 peptidoglycan

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 3 only

7 Descriptions of cell structures are listed.

1 surrounded by a single membrane and enclosing a large fluid-filled space

2 formed by two membranes enclosing a matrix; the inner membrane is folded

3 formed by a membrane that has flattened sacs and tubular structures inter-connected throughout the cell

4 formed of nucleic acid and protein attached to membranes or free in the cytoplasm

Which row shows the typical cells in which these cell structures are found?

	plant cell	**animal cell**
A	1, 2 and 3 only	1, 2 and 4 only
B	1, 2, 3 and 4	2, 3 and 4 only
C	3 and 4 only	1, 3 and 4 only
D	2, 3 and 4 only	2 and 3 only

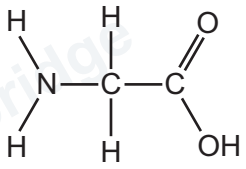
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8 A student was given a solution labelled U and asked to identify the biological molecule it contained.

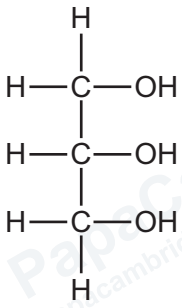
The student added 2 cm^3 of Benedict's solution to 2 cm^3 of U, heated the mixture in a water-bath at 100 °C, and recorded that the mixture turned green.

Which biological molecule would give this result?

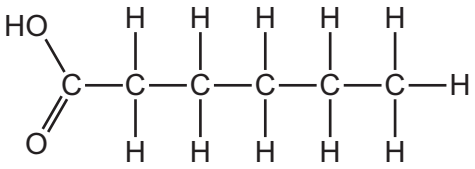
A



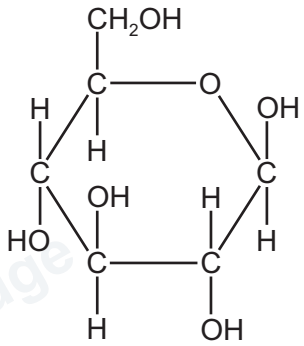
B



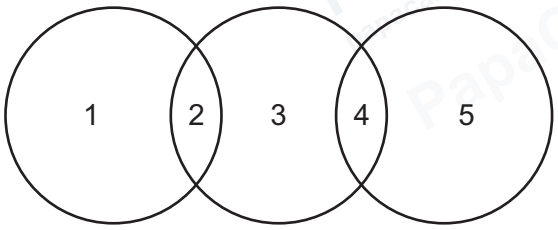
C



D



9 The diagram shows the relationship between some biological molecules.



Which row is correct?

	1	2	3	4	5
A	α-glucose	carbohydrate	sucrose	monomer	fructose
B	cellulose	polymer	starch	carbohydrate	amylase
C	fructose	reducing sugar	β-glucose	monomer	amino acid
D	haemoglobin	protein	amylose	polymer	cellulose

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10 What is a function of glycogen?

A support

B storage

C transport

D insulation

11 Which property of triglyceride molecules means that they are an important source of energy in living organisms?

A The hydrocarbon tails are non-polar and are insoluble in water.

B They have long carbon chains with many carbon–hydrogen bonds.

C They have many covalent bonds between the fatty acids and the glycerol molecules.

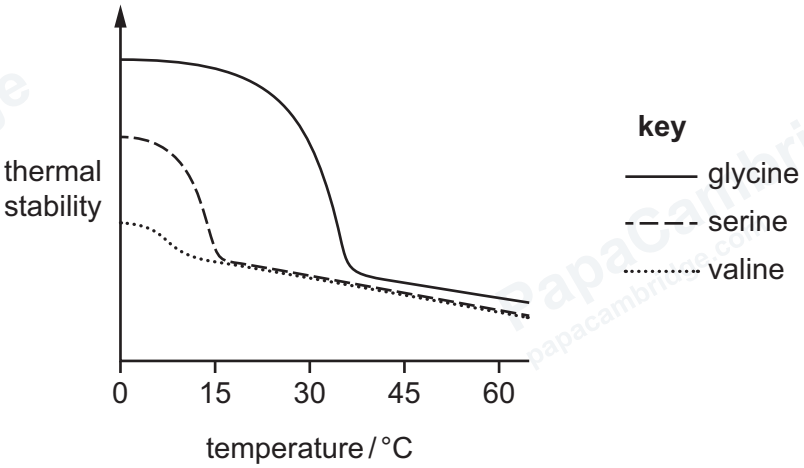
D The molecules are hydrophobic and do **not** mix with water.

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12 The thermal stability of collagen is measured by determining the temperature at which the three polypeptide subunits of collagen molecules become fully separated.

The graph shows how changing the amino acid sequence in the polypeptides that make up collagen molecules causes a change in the thermal stability of collagen.

Glycine is the amino acid with the smallest variable group. Scientists changed this amino acid in collagen polypeptides to either serine or valine.



A student analysed the graph and suggested three possible explanations.

- The variable groups of valine and serine are too large to allow close packing of collagen fibres.
- There are more hydrogen bonds present between collagen polypeptides that contain serine instead of glycine, than between collagen polypeptides that contain valine instead of glycine.
- The triple helices that make up collagen are less separated at higher temperatures in the protein with glycine than in the proteins with either serine or valine.

How many of these explanations could be correct?

A 0 **B** 1 **C** 2 **D** 3

13 A student listed some possible steps to measure the progress of a starch–amylase catalysed reaction.

1 Calibrate the colorimeter with a dilute iodine solution.

2 Measure the light transmission with a colour filter.

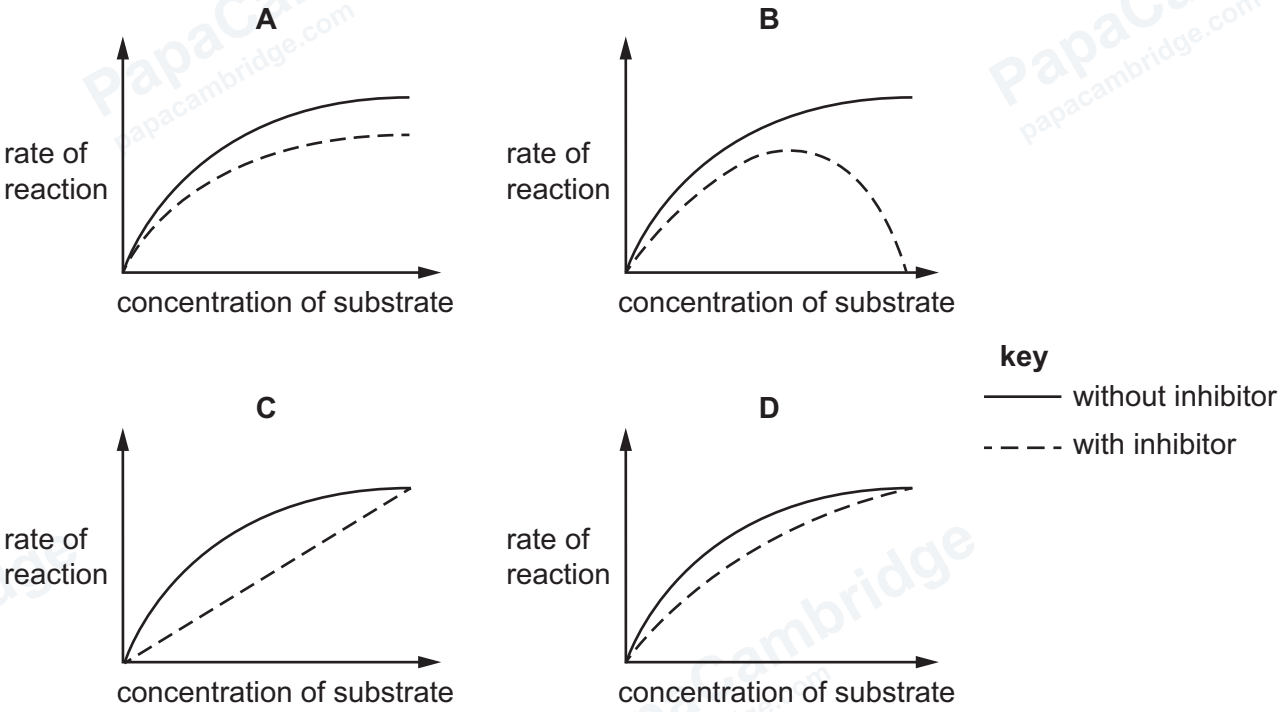
3 Measure the absorbance of the reaction at different wavelengths of light.

Which steps are required in their method?

A 1, 2 and 3 **B** 1 and 2 only **C** 2 and 3 only **D** 3 only

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14 Which graph represents the action of a non-competitive inhibitor?



15 Glucose isomerase is an enzyme often used in commercial food production as it catalyses the conversion of glucose to fructose, which has a sweeter taste. The enzyme is immobilised onto a surface or within agarose beads as part of this process.

The reaction is carried out between 55 °C and 60 °C.

Which statements explain why carrying out the reaction at this temperature is beneficial?

1 Immobilised enzymes contain more active sites at higher temperatures.

2 The activation energy of the reaction is more likely to be reached.

3 Increased kinetic energy results in more collisions between enzyme and substrate.

4 Maintaining this temperature is cheaper than carrying it out at lower temperatures.

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

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16 Yeast cells have cell walls that contain glycoproteins.

The statements describe the process that moves glycoproteins to the cell walls of yeast cells.

- Glycoproteins are packaged into vesicles.
- Vesicles move to the cell surface membrane.
- Vesicles fuse with the cell surface membrane.
- Glycoproteins are released into the cell wall.

What is the process that transports glycoproteins to the cell walls?

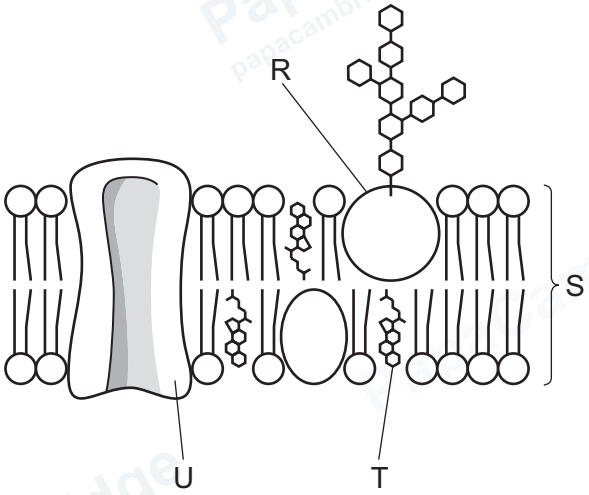
A active transport

B endocytosis

C exocytosis

D facilitated diffusion

17 The diagram shows the structure of the cell surface membrane.



Which molecules regulate the fluidity of the membrane?

A R and S **B** S and T **C** T and U **D** U and R

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18 A student carried out an investigation to find the effect of surface area to volume ratio on the rate of diffusion of acid into an agar block.

The student cut different-sized agar blocks containing a pH indicator and placed each agar block into different test-tubes. They recorded the time taken for each agar block to change colour completely.

Which row is correct for this investigation?

	dependent variable	variable that should be standardised during the investigation
A	the size of the agar block	concentration of indicator in the agar block
B	time taken for the block to change colour completely	height of test-tube
C	the size of the agar block	time the block is in the acid
D	time taken for the block to change colour completely	temperature

19 Some plant cells are immersed in a range of solutions of different concentrations. In the more dilute solutions the cells gained mass.

Which statement is the correct explanation for this result?

A The plant cells gain water in solutions of lower water potential.

B Osmosis occurs across the permeable cell wall.

C The water potential inside the plant cells is higher than in the solutions.

D The plant cells gain mass in solutions of higher water potential.

20 The table shows two stages of the mitotic cell cycle and structures that are found within typical plant cells.

Which row shows structures that are present during cytokinesis and G_1 in plant cells?

	cytokinesis	G_1
A	centromeres	telomeres
B	centrioles	nucleoli
C	nucleoli	sister chromatids
D	sister chromatids	nuclear envelope

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21 Scientists investigated the roles of two genes, gene P and gene Q, in stimulating mitosis in tumour cells.

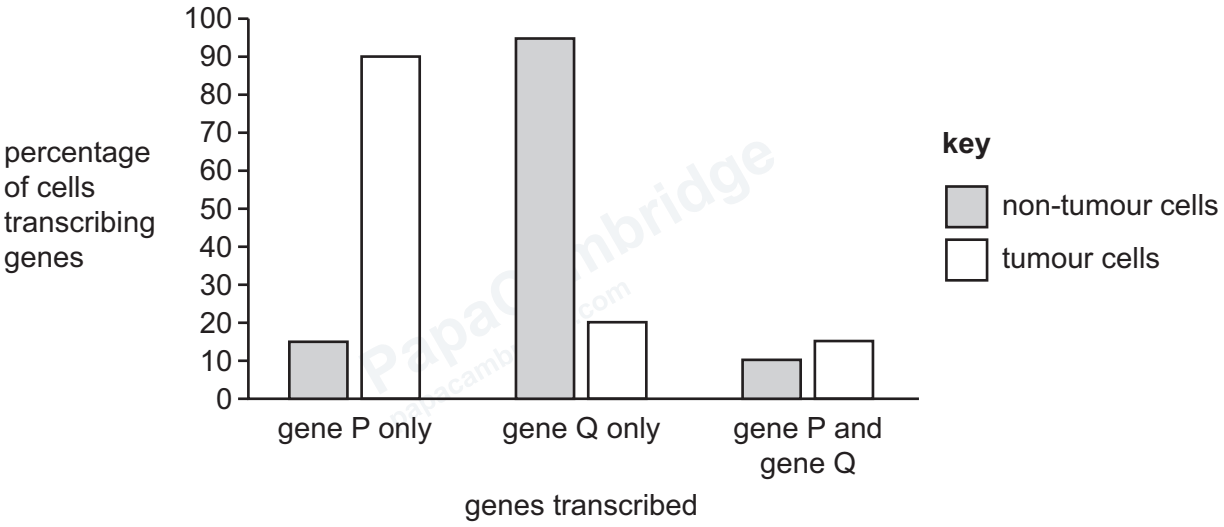
The scientists grew cells from different types of tumour and from non-tumour cells and measured:

1 the percentage of cells that transcribed gene P only

2 the percentage of cells that transcribed gene Q only

3 the percentage of cells that transcribed both gene P and gene Q.

The results are shown.



What can be concluded from the graph about the functions of gene P and gene Q?

	function of gene P	function of gene Q
A	prevents mitosis from starting	prevents mitosis from starting
B	prevents mitosis from starting	stimulates mitosis to start
C	stimulates mitosis to start	prevents mitosis from starting
D	stimulates mitosis to start	stimulates mitosis to start

22 Which statements are correct?

1 Adenine forms three hydrogen bonds with its base pair.

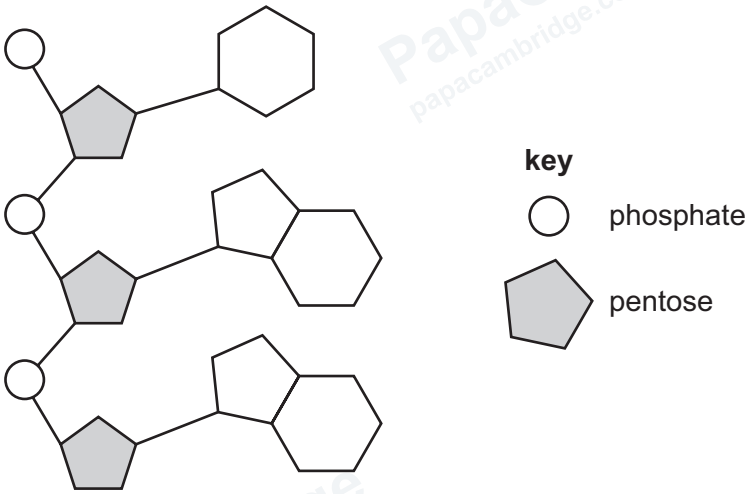
2 The DNA nucleotide containing adenine is different from the RNA nucleotide containing adenine.

3 Purines form base pairs with pyrimidines.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

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23 The diagram shows part of a polynucleotide.



What is a possible base sequence shown in the diagram?

A C A G **B** T A C **C** T G U **D** U C A

24 Which statement about the lagging strand in DNA replication is correct?

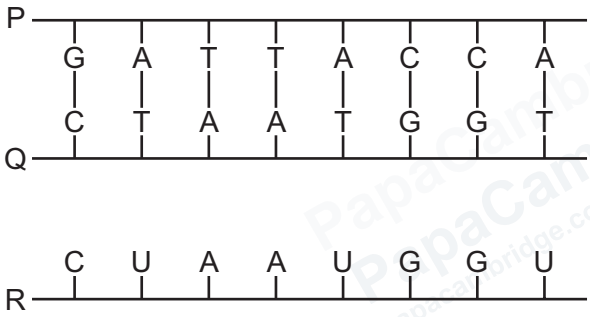
A DNA ligase catalyses the formation of phosphodiester bonds between short DNA fragments.

B DNA ligase catalyses the formation of hydrogen bonds between nucleotides.

C DNA polymerase adds nucleotides to the lagging strand in a 3′ to 5′ direction.

D DNA polymerase adds nucleotides to the lagging strand in a 5′ to 3′ direction continuously.

25 The diagram shows a short part of three nucleic acid strands.

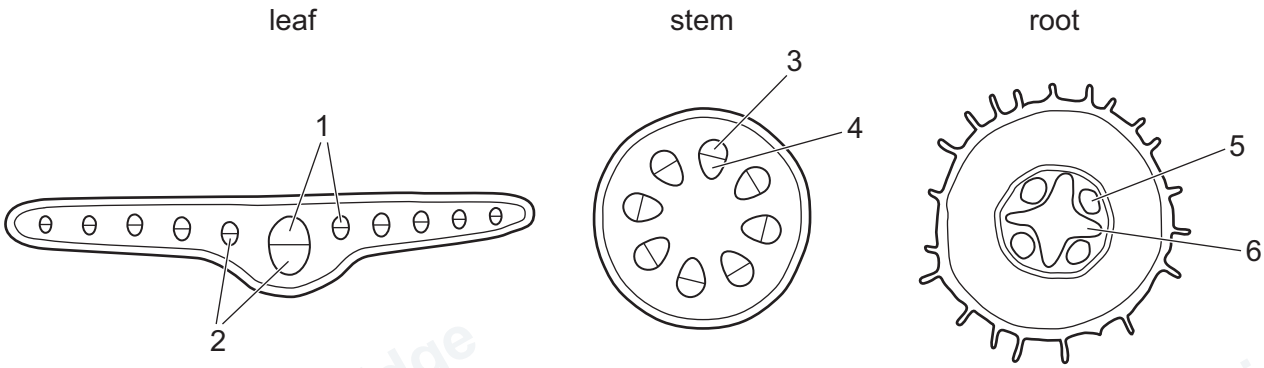


Which row is correct?

	transcribed strand	location of transcription
A	P	nucleus
B	R	nucleus
C	P	ribosome
D	R	ribosome

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26 The diagrams show transverse sections of parts of a plant.



Which tissues transport most amino acids?

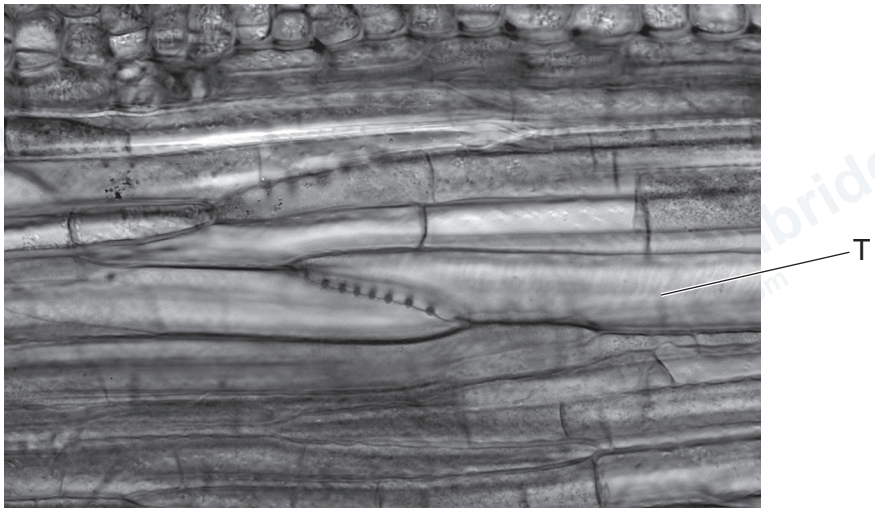
	1	2	3	4	5	6
A	✓	✗	✓	✗	✗	✓
B	✓	✗	✗	✓	✗	✓
C	✗	✓	✓	✗	✓	✗
D	✗	✓	✗	✓	✓	✗

key

✓ = transports most amino acids

✗ = does **not** transport most amino acids

27 The photomicrograph shows a transport tissue in the stem of a grape vine.



One of the cells in this transport tissue is labelled T.

Which statement about the cell labelled T is correct?

A T has end walls that allow liquids to move by mass flow through the plant.

B T has lignified walls to provide mechanical strength to the plant.

C T has plasmodesmata that actively transport liquids through the plant.

D T transports water and mineral ions to the source.

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[Turn over

28 The table lists some adaptations of plants.

Which row correctly describes xerophytic adaptations?

	folded leaves	high stomatal density	thin waxy cuticle	increased lignin in vascular tissue
A	✓	✓	✗	✗
B	✗	✗	✓	✓
C	✓	✗	✗	✓
D	✓	✗	✓	✗

key

✓ = xerophytic adaptation

✗ = **not** a xerophytic adaptation

29 Which combination of changes for loading of sucrose into the phloem by companion cells is correct?

A The water potential inside companion cells is increased, because protons are actively transported from the companion cell cytoplasm into the cell wall.

B The water potential inside the companion cell is increased, because protons and sucrose are co-transported into the companion cell cytoplasm from the cell wall.

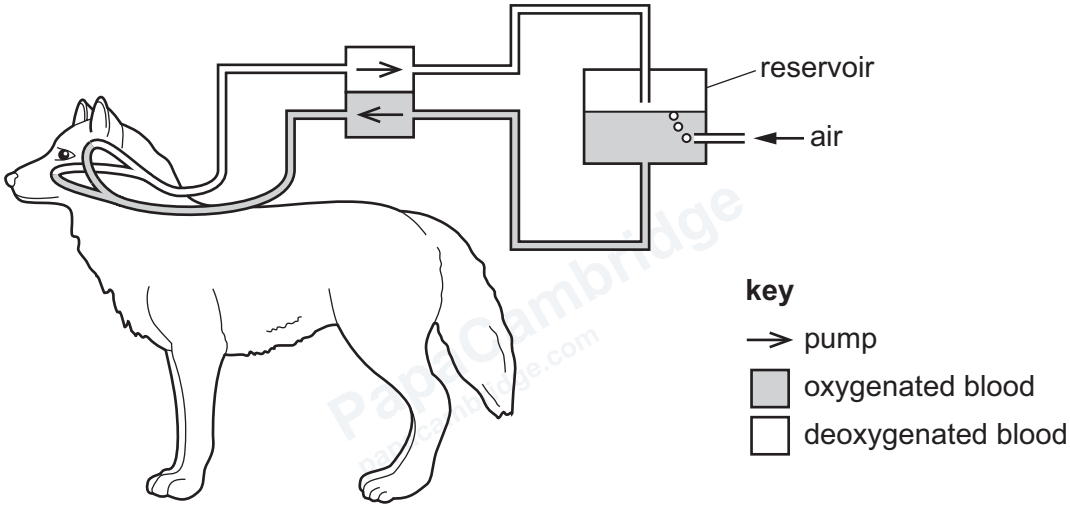
C The water potential inside the companion cells is decreased, because protons are actively transported from the companion cell cytoplasm into the cell wall.

D The water potential inside the companion cells is decreased, because protons and sucrose are co-transported into the companion cell cytoplasm from the cell wall.

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30 The diagram shows an experiment that took place in 1940 to revive an animal.

Air is bubbled through the reservoir to oxygenate the blood. The tubes enter and leave the neck of the animal.



Which characteristics of mammalian circulation does the diagram represent?

	closed system	heart	double circulation
A	✗	✗	✗
B	✗	✓	✗
C	✓	✓	✗
D	✓	✓	✓

key

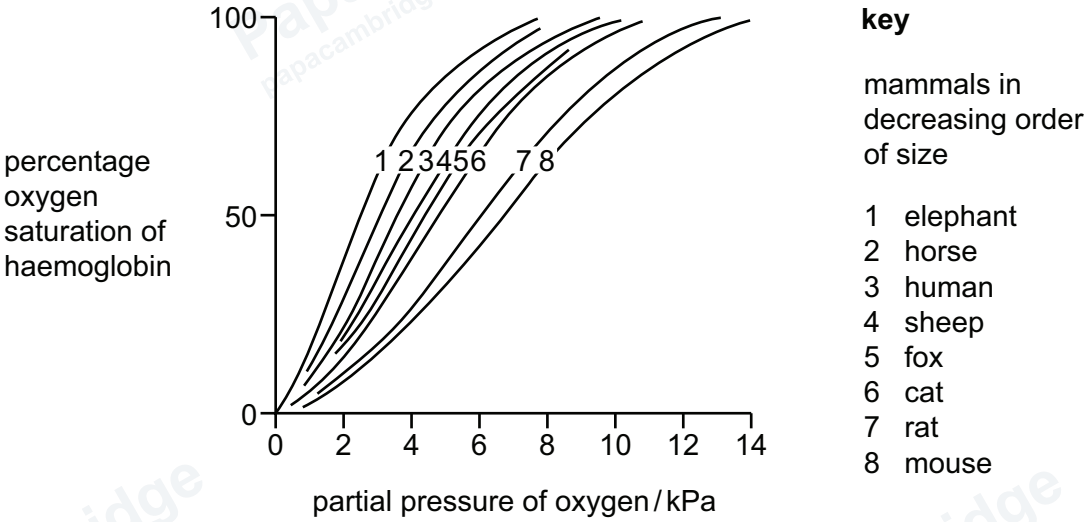
✓ = represents

✗ = does **not** represent

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[Turn over

31 The graph shows the oxygen dissociation curves of haemoglobin for eight species of mammal.



What can be concluded from the data shown in the graph?

A The haemoglobin of larger mammals will combine with oxygen at a lower partial pressure of oxygen than that of smaller mammals.

B The haemoglobin of larger mammals will release oxygen at a higher partial pressure of oxygen than that of smaller mammals.

C The metabolic activity of the mammal is directly proportional to the ability of its haemoglobin to release oxygen.

D The size of the mammal is directly proportional to the ability of its haemoglobin to release oxygen.

32 Which reactions would be affected by an inhibitor of carbonic anhydrase?

1 CO_2 + haemoglobin $\rightarrow$ carbaminohaemoglobin

2 $CO_2 + H_2O \rightarrow H_2CO_3$

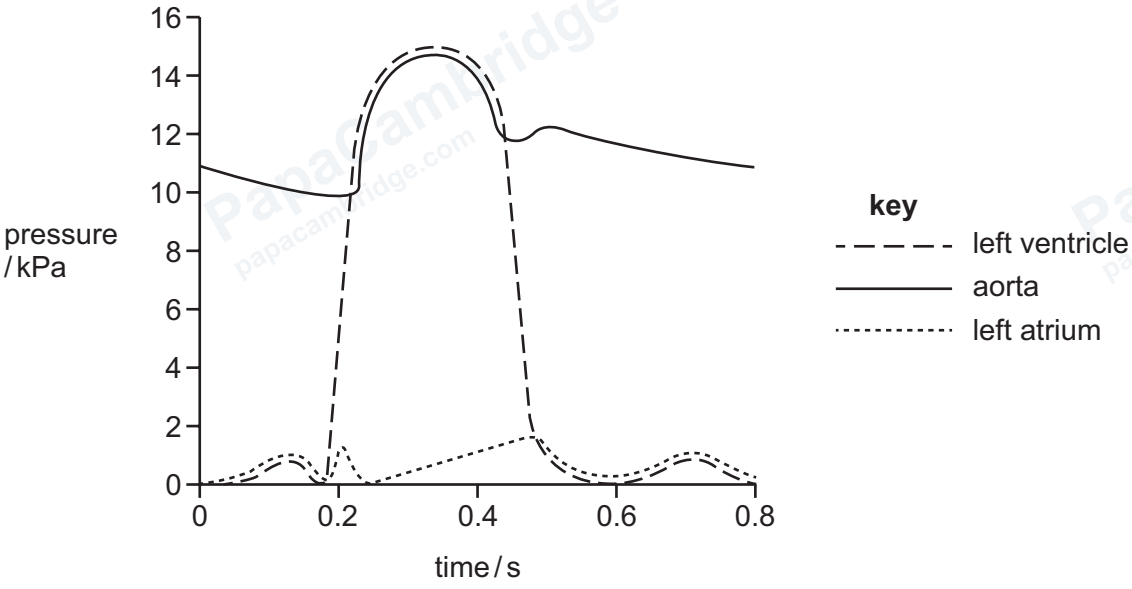
3 $H_2CO_3 \rightarrow H^+ + HCO_3^-$

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

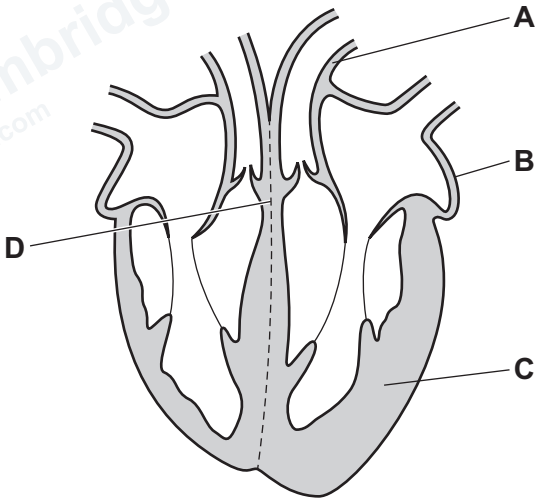
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33 The graph shows the pressure in three parts of the heart during one cardiac cycle.



At 0.2 seconds, which part of the heart is responding to the excitatory stimulus?



34 Which statement correctly describes an event in the cardiac cycle that occurs immediately after atrial systole?

A A wave of excitation passes through the sinoatrial node (SAN), before spreading down to the base of the septum.

B Electrical impulses pass from the muscles of the atria to the muscles of the ventricles to cause ventricular systole.

C Electrical impulses pass through conducting fibres, which cause a delay before spreading to Purkyne tissue.

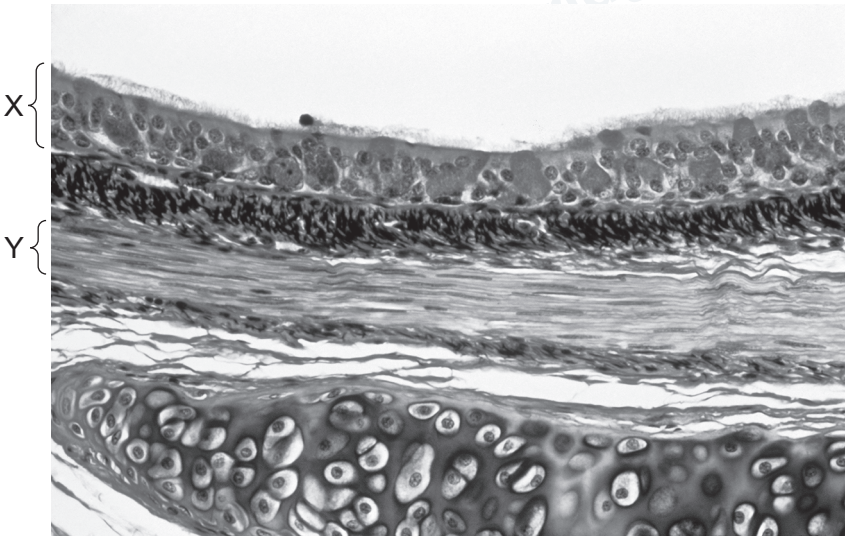
D The semilunar valves close to prevent the backflow of blood.

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35 The photomicrograph shows a transverse section through a bronchus.



What is the function of the tissues X and Y?

	X	Y
A	secrete mucus	prevent collapse of the airway
B	remove pathogens from airway	deliver oxygen to surrounding tissues
C	trap dust and dirt	store energy
D	waft mucus upwards	constrict airway

36 Gas exchange between air in the alveoli and blood in the capillaries is dependent on the process of diffusion.

The rate of diffusion is proportional to $\frac{\text{surface area} \times \text{concentration difference}}{\text{distance over which diffusion occurs}}$.

What would result in the fastest rate of diffusion?

A The distance is doubled, and the surface area is doubled.

B The concentration difference is halved, and the surface area is doubled.

C The distance is halved, and the surface area is doubled.

D The concentration difference is trebled, and the other variables are kept the same.

37 What increases the risk of contracting TB?

1 drinking unpasteurised milk

2 eating shellfish which have been contaminated with faeces

3 living in overcrowded conditions

A 1 and 2 **B** 1 and 3 **C** 2 and 3 **D** 3 only

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38 Which statement about how the antibiotic penicillin kills bacteria is correct?

A It prevents the synthesis of the cross-links in the peptidoglycan membrane.

B It inhibits transcription which prevents the synthesis of proteins.

C It slows down cell division by inhibiting replication of bacterial DNA.

D It weakens the bacterial cell wall by inhibiting enzymes.

39 Which type of cell is fused with a myeloma cell in monoclonal antibody production?

A B-lymphocyte

B hybridoma

C T-lymphocyte

D stem cell

40 A pathogen has antigens X and Y on its cell surface membrane that allow it to attach and enter human cells.

Which statement is correct for a vaccine against this pathogen?

A The vaccine must contain antigens X and Y to produce a secondary immune response in the person.

B The vaccine to antigen Y must contain the pathogen with Y removed or modified to prevent causing disease.

C The vaccine to antigen X must stimulate the production of antibodies that mark the pathogen for destruction.

D The vaccine must contain the pathogen with antigens X or Y on its surface to stimulate an immune response.

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