Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/21**

Paper 2 Multiple Choice (Extended) **October/November 2018**

45 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

3938804197

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.
DO **NOT** WRITE IN ANY BARCODES.

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 separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
Electronic calculators may be used.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **18** printed pages and **2** blank pages.

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1 The sundew is a carnivorous plant that can trap small insects with sticky hairs and then digest them. When an insect gets stuck, other nearby sticky hairs bend over to trap the insect.

Which characteristics of living organisms are demonstrated when the sundew traps insects?

A growth and excretion

B growth and sensitivity

C movement and excretion

D movement and sensitivity

2 Systems of classification show which organisms share more recent ancestors.

What is the most accurate system of classification?

A using anatomy

B using DNA base sequences

C using morphology

D using a pedigree diagram

3 Which part of a plant cell controls the movement of substances into and out of the cell?

A cell membrane

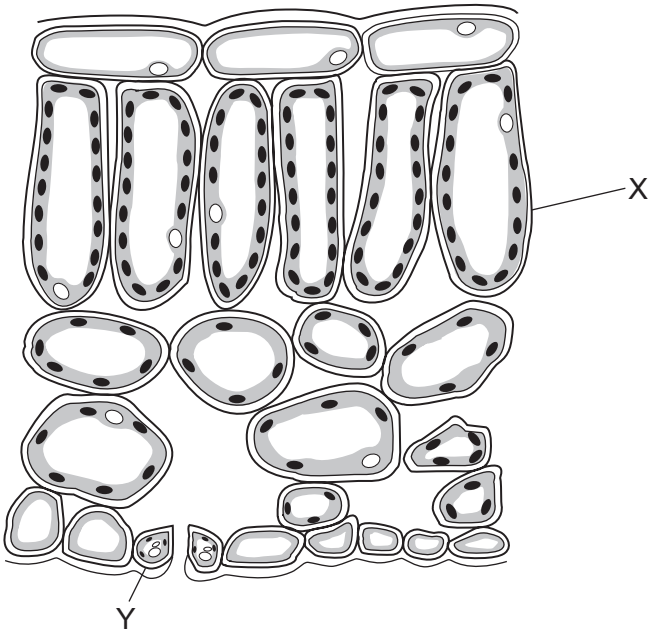
B cell wall

C cytoplasm

D vacuole

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4 The diagram shows part of a leaf in cross-section.



Structures X and Y are both part of the same

A cell.

B organ.

C tissue.

D vessel.

5 How do carbon dioxide and oxygen move into and out of a mesophyll cell?

A active transport

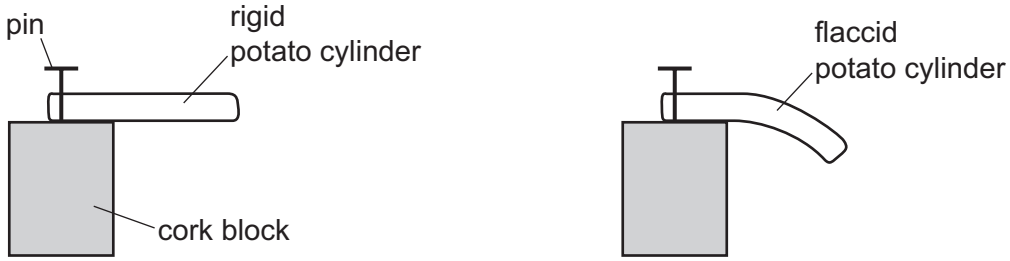
B diffusion

C respiration

D transpiration

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6 Four freshly cut potato cylinders were soaked for one hour in different salt solutions before being pinned to cork blocks. Two of the blocks are shown.



Which solution would cause the potato cylinder to be most flaccid?

A 0.1 mol per dm^3 salt solution

B 0.3 mol per dm^3 salt solution

C 0.7 mol per dm^3 salt solution

D 1.0 mol per dm^3 salt solution

7 The data show the concentrations of sugar and starch in an onion.

total sugar including reducing sugar / g per 100g	starch / g per 100g
3.7	0.0

The onion is tested with Benedict's solution and iodine solution.

Which set of results is correct?

	Benedict's solution	iodine solution
A	blue	blue-black
B	blue	brown
C	brick red	blue-black
D	brick red	brown

8 Which statement about the structure of DNA is correct?

A Base A always pairs with base C.

B Base A always pairs with base T.

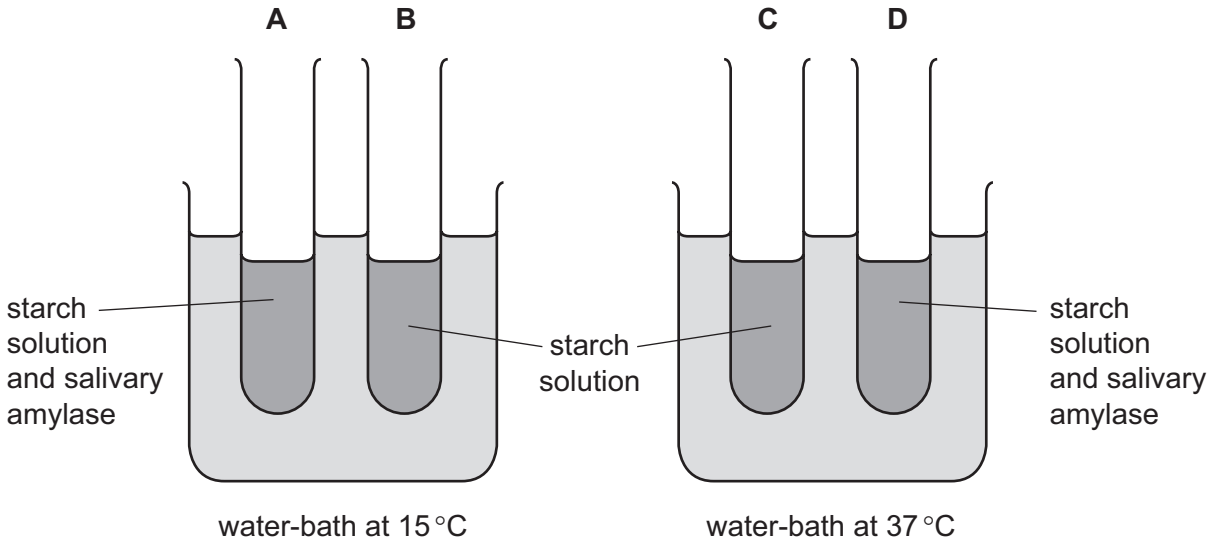
C It consists of proteins.

D It forms a single helix.

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9 The apparatus shown is used for an experiment on starch digestion.

Which test-tube contains the most sugar after 20 minutes?



10 A student wrote some notes about enzymes.

She wrote:

'The .....1..... of the enzyme is .....2..... to an area on the substrate.

This area on the substrate can fit into it to form an .....3..... complex'.

Which words correctly complete gaps 1, 2 and 3?

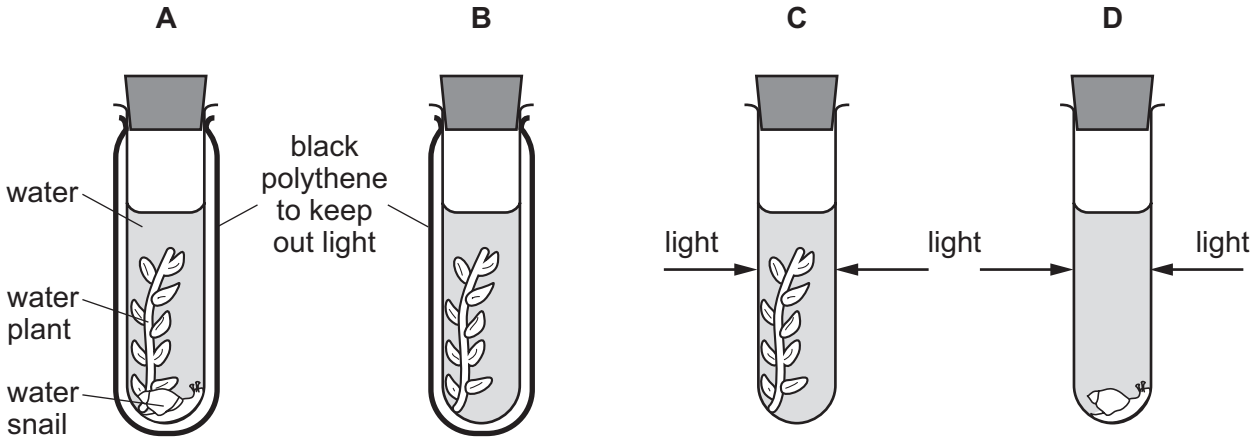
	1	2	3
A	active site	complementary	enzyme-substrate
B	active site	similar	enzyme-product
C	shape	complementary	enzyme-product
D	shape	similar	enzyme-substrate

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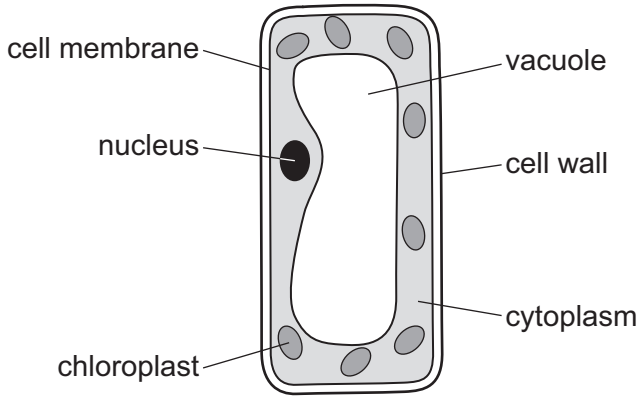
11 An experiment was carried out using the apparatus shown.

The carbon dioxide content of the water in each test-tube was measured at the start and again three hours later.

In which test-tube would there be a decrease in carbon dioxide content?



12 The diagram shows a plant cell.



Which type of cell is shown?

A cuticle cell

B epidermal cell

C palisade mesophyll cell

D spongy mesophyll cell

13 What is the result of a diet lacking iron?

A bleeding gums

B poor wound healing

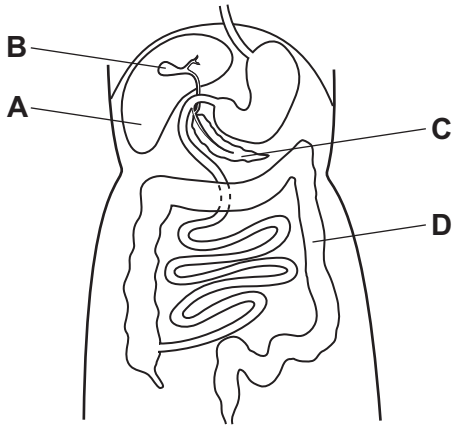
C reduced number of red blood cells

D weak bones and teeth

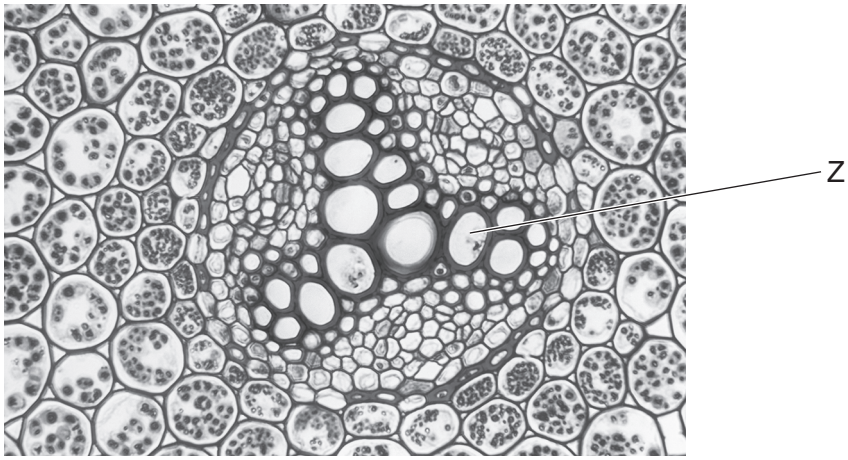
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14 The diagram shows part of the alimentary canal.

Which structure produces lipase?



15 The photomicrograph shows a cross-section through a buttercup root.



What is the function of the tissue labelled Z?

A site of photosynthesis

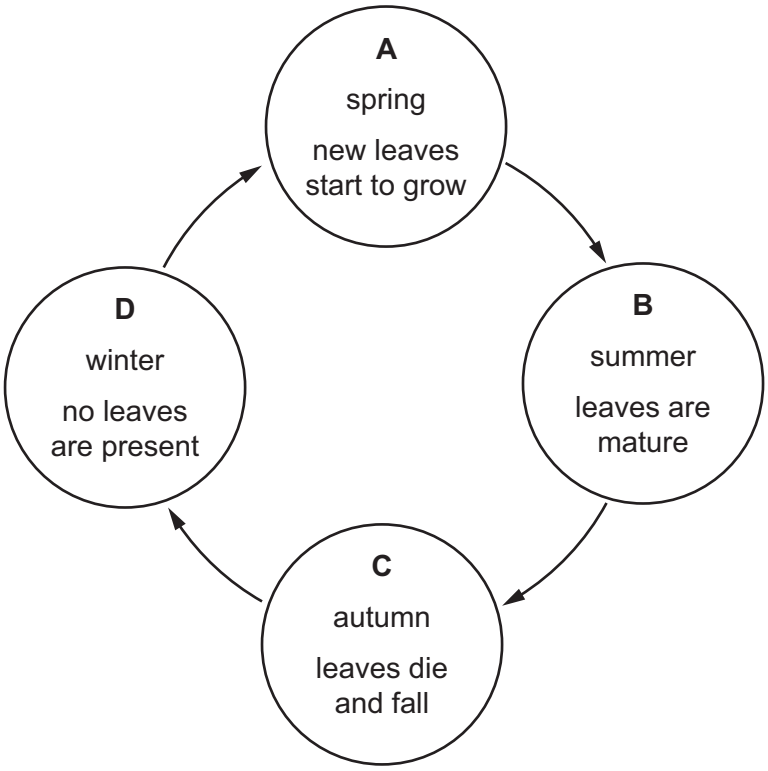
B site of respiration

C transport of sugars

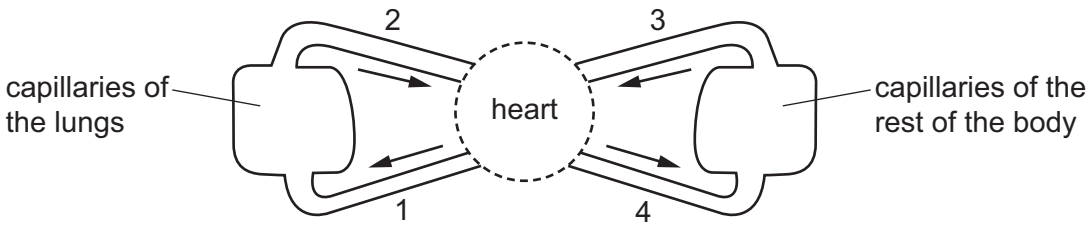
D transport of water

16 Roots and leaves both act as a source and a sink for sucrose and amino acids at different times during the year.

At which point in the year are the roots most active as a source?



17 The diagram shows a circulatory system.



Which vessels carry oxygenated blood?

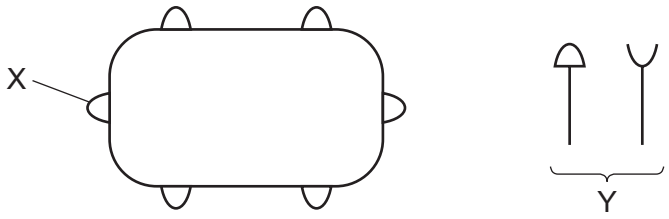
A 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

18 What happens to the heart valves when the ventricles contract?

	atrioventricular valves	semilunar valves
A	valves close	valves close
B	valves close	valves open
C	valves open	valves close
D	valves open	valves open

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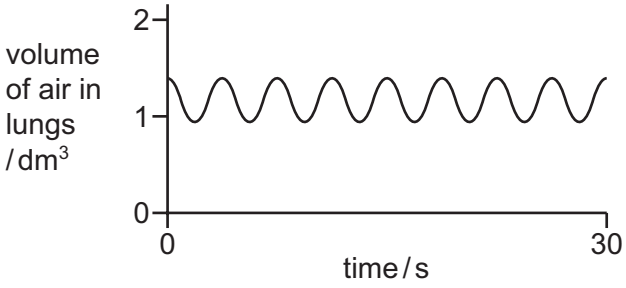
19 The diagram with the structure labelled X shows a bacterium with proteins on its surface. The diagram labelled Y shows proteins made by the human body.



Which row shows the correct combination for destroying the bacterium?

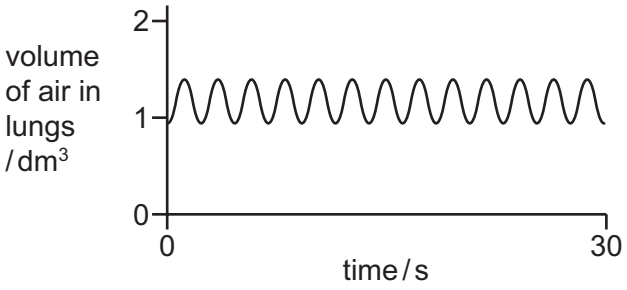
	name of X	name of Y	correct shape of Y
A	antigen	antibody	
B	antibody	antigen	
C	antigen	antibody	
D	antibody	antigen	

20 The graph shows changes in the volume of air in the lungs of a person at rest, over a period of 30 seconds.

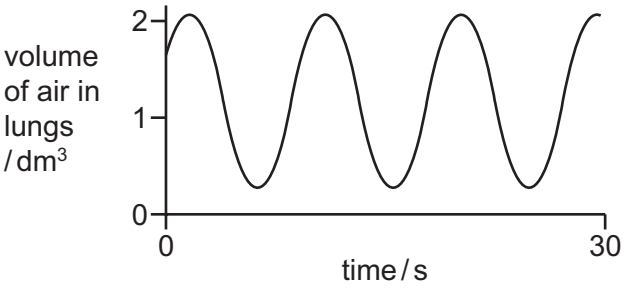


Which graph shows changes in the volume of air in the lungs of the same person immediately after they have done five minutes of vigorous exercise?

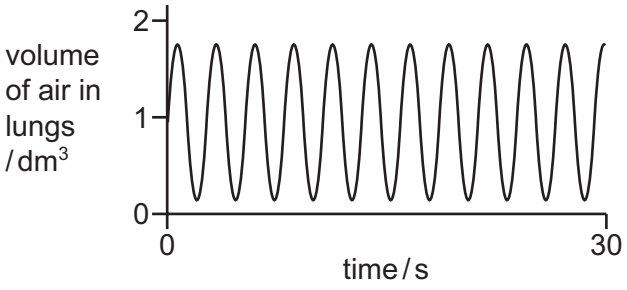
A



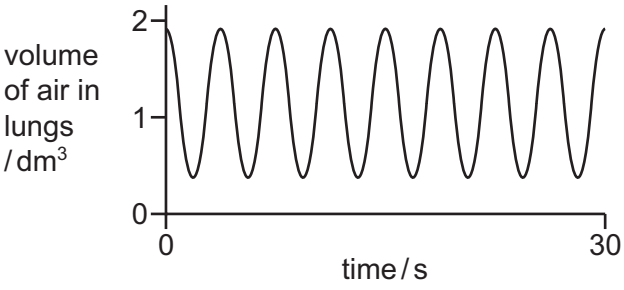
B



C



D



21 What is produced by anaerobic respiration in mammals?

A alcohol + carbon dioxide

B alcohol + oxygen

C lactic acid + carbon dioxide

D lactic acid

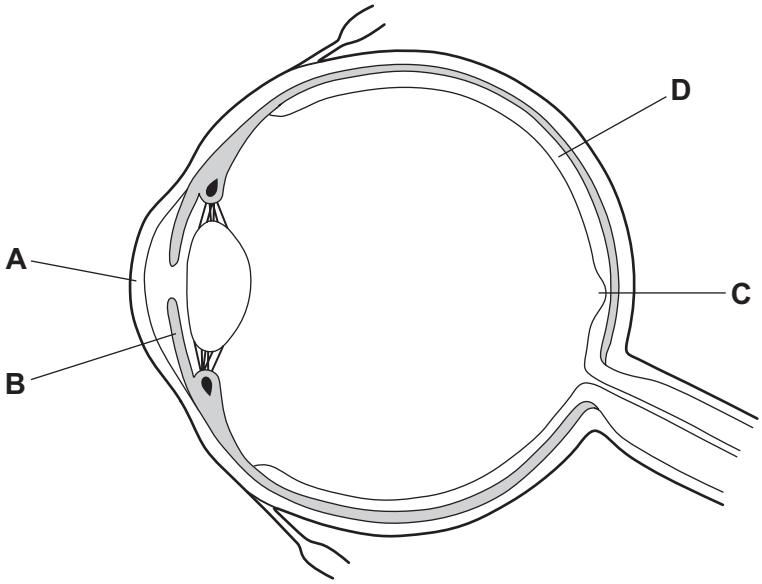
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22 Which row describes the functions of the bladder, kidneys and liver?

	production of urea	excretion of urea	storage of urine
A	liver	bladder	kidneys
B	bladder	kidneys	liver
C	liver	kidneys	bladder
D	kidneys	liver	bladder

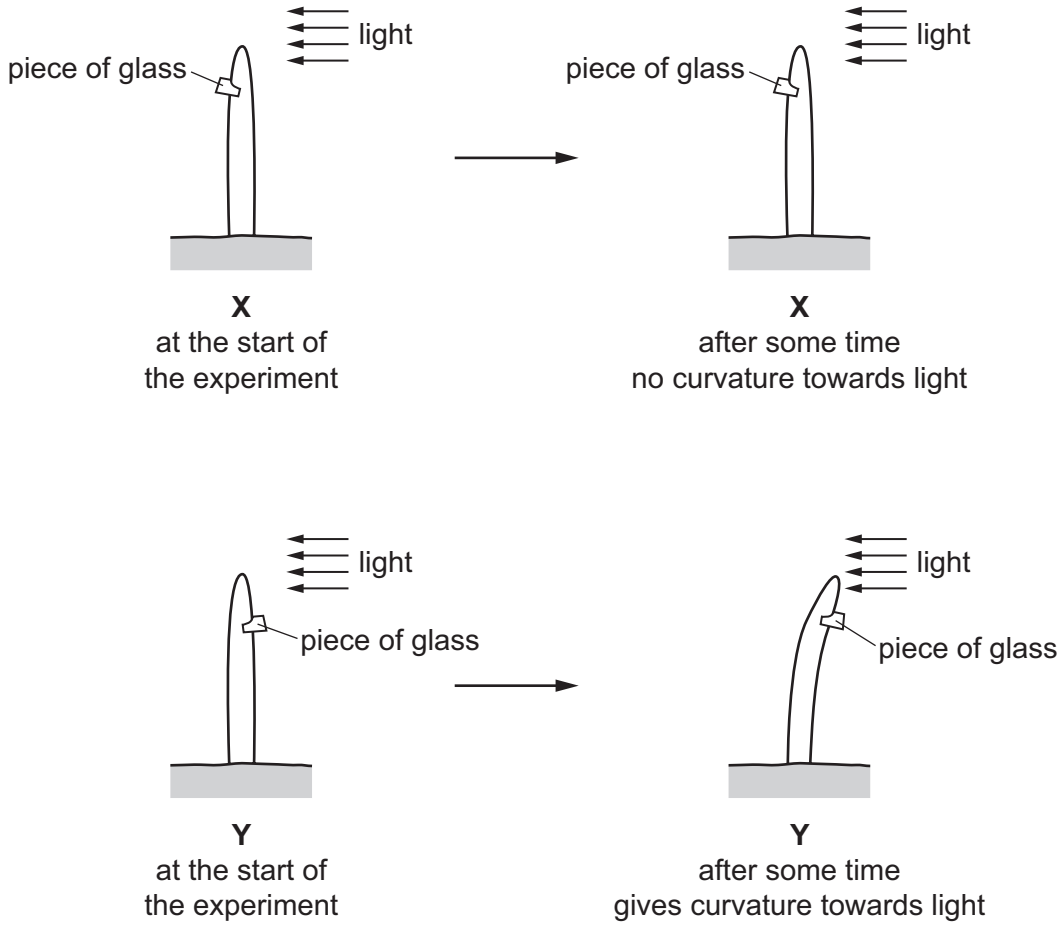
23 The diagram shows the structure of the eye.

Which structure refracts light?



24 A student used two seedlings X and Y to investigate phototropism.

The diagram shows their investigation.



Which statement explains the difference in results between **X** and **Y**?

A The piece of glass destroyed the auxin on the shaded side of the seedling.

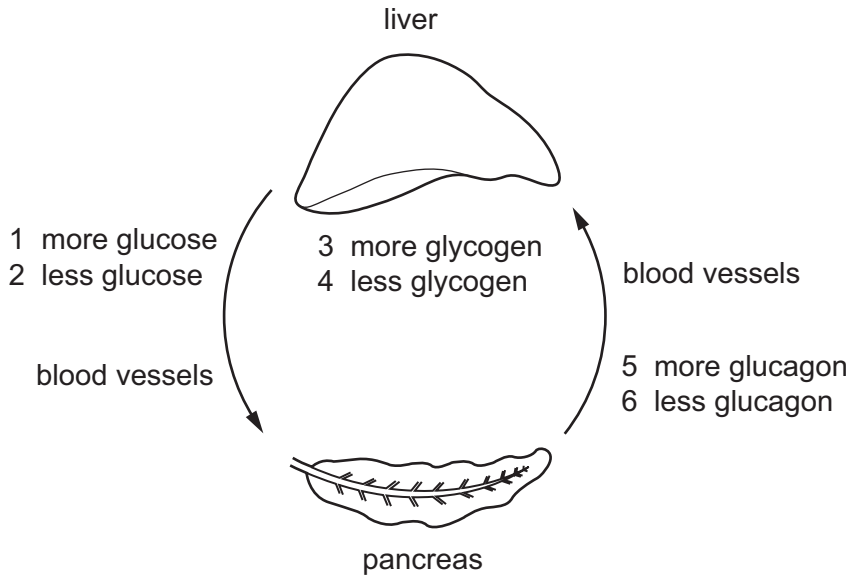
B The piece of glass destroyed the auxin on the side of the seedling facing the light.

C The piece of glass in **X** stopped the auxin travelling down the shaded side of the seedling.

D The piece of glass in **X** stopped the auxin travelling down the side of the seedling facing the light.

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25 The diagram shows part of the mechanism that controls blood sugar concentration.

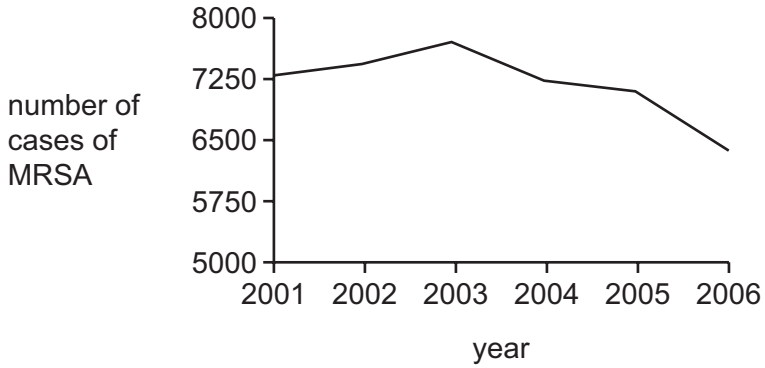


A person does one hour of exercise.

Starting with the pancreas, what is the sequence of events in which the hormone glucagon is involved?

A $5 \rightarrow 3 \rightarrow 2$ **B** $5 \rightarrow 4 \rightarrow 1$ **C** $6 \rightarrow 3 \rightarrow 1$ **D** $6 \rightarrow 4 \rightarrow 2$

26 The graph shows the number of cases of MRSA in one country between 2001 and 2006.



Between which years was the **greatest** change in the number of cases of MRSA seen?

A 2002 and 2003

B 2003 and 2004

C 2004 and 2005

D 2005 and 2006

27 Which row describes sexual reproduction?

	gamete nucleus	zygote nucleus	genetically different offspring produced
A	diploid	diploid	✗
B	diploid	haploid	✗
C	haploid	diploid	✓
D	haploid	haploid	✓

28 Which statement describes human male gametes?

A large, few and non-motile

B large, numerous and motile

C small, few and non-motile

D small, numerous and motile

29 Which organ secretes the most progesterone during pregnancy?

A adrenal gland

B ovary

C placenta

D uterus

30 What is the role of mRNA?

A assembles amino acids into protein molecules

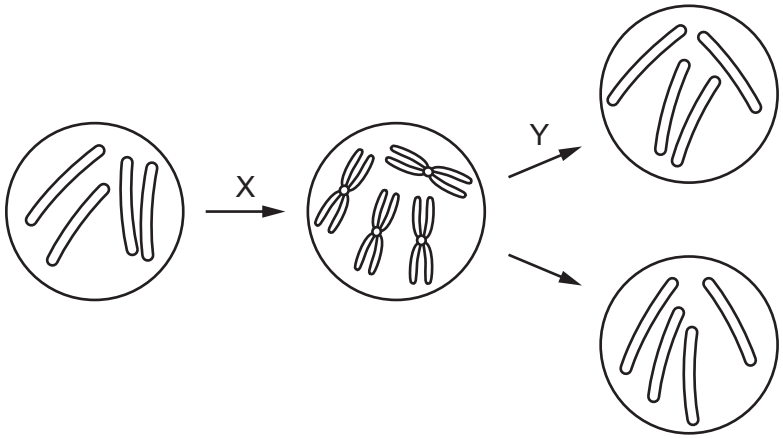
B carries a copy of the gene out of the nucleus

C controls cell function by controlling the production of proteins

D duplicates chromosomes before mitosis

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31 The diagram shows the formation of new diploid cells.



What do arrows X and Y represent?

	X	Y
A	duplication of chromosomes	meiosis
B	duplication of chromosomes	mitosis
C	meiosis	duplication of chromosomes
D	mitosis	duplication of chromosomes

32 A man marries a woman who has a different blood group from him. They have two children. The children have different blood groups from each other and different blood groups from their parents.

What are the genotypes of the parent's blood groups?

A I^AI^A and I^AI^B **B** I^AI^A and I^oI^o **C** I^AI^B and I^BI^B **D** I^AI^B and I^oI^o

33 Sickle-cell anaemia is a genetic disease that is caused by the allele Hb^S.

Hb^A is the normal allele.

A woman does not have the symptoms of the disease but her brother does show symptoms.

If her mother and father do **not** have symptoms, which statement is correct?

A The woman has the genotype Hb^SHb^S.

B The woman's brother has the genotype Hb^AHb^A.

C The woman's father and mother both have the genotype Hb^AHb^S.

D The woman's father and mother both have the genotype Hb^SHb^S.

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34 Over the last 30 years some antibiotics have become less effective in treating bacterial infection.

What is the reason for this?

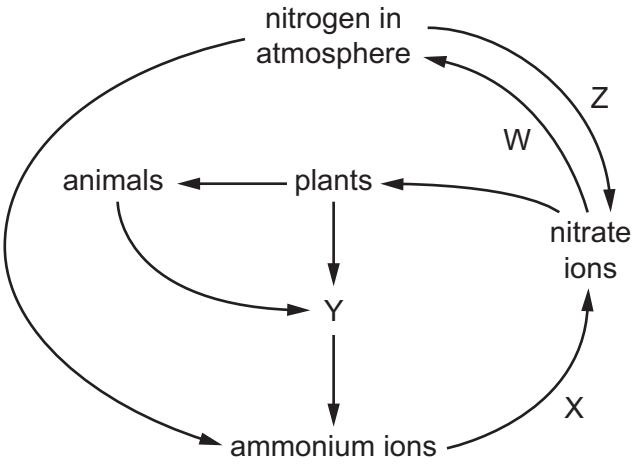
A artificial selection

B asexual reproduction

C more effective new antibiotics

D natural selection

35 The diagram shows part of the nitrogen cycle.



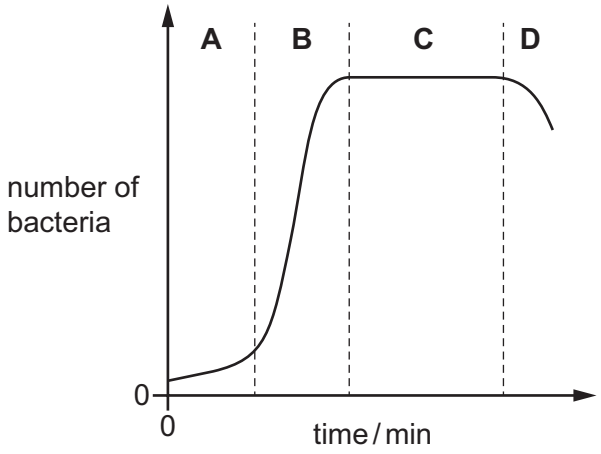
Which row correctly identifies the bacteria involved in processes W, X, Y and Z?

	W	X	Y	Z
A	denitrifying	decomposer	nitrifying	nitrogen-fixing
B	denitrifying	nitrifying	decomposer	nitrogen-fixing
C	nitrifying	decomposer	nitrogen-fixing	denitrifying
D	nitrogen-fixing	nitrifying	decomposer	denitrifying

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36 The graph shows a bacteria population curve.

In which phase on the graph is the number of bacteria dying equal to the number dividing?



37 Bacteria are used in genetic engineering and biotechnology.

Bacteria are used because of the presence of which cell structure?

A cell membrane

B cell wall

C cytoplasm

D plasmids

38 What is an example of genetic engineering?

A using enzymes to make washing powders

B using pectinase to make fruit juice

C producing plants that have been given genes for resistance to insect pests

D using yeast to make bread

39 What is **least** likely to result from deforestation?

A increase in flooding

B increase in species

C loss of habitats

D loss of soil

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[Turn over

40 Pieces of plastic between 1 μm and 1 mm in size are called microplastics. Microplastics are put into some face creams and are produced during clothing manufacture. They can now be found in increasing quantities in oceans all over the world.

As well as their small size, which other property of microplastics make them dangerous to living organisms?

A They are lightweight.

B They are non-biodegradable.

C They are non-reactive.

D They are toxic.

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