**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)

**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.



© UCLES 2018

CAMBRIDGE International Examinations

**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.

View solution

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.

View solution

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?

View solution

**A** cell membrane

**B** cell wall

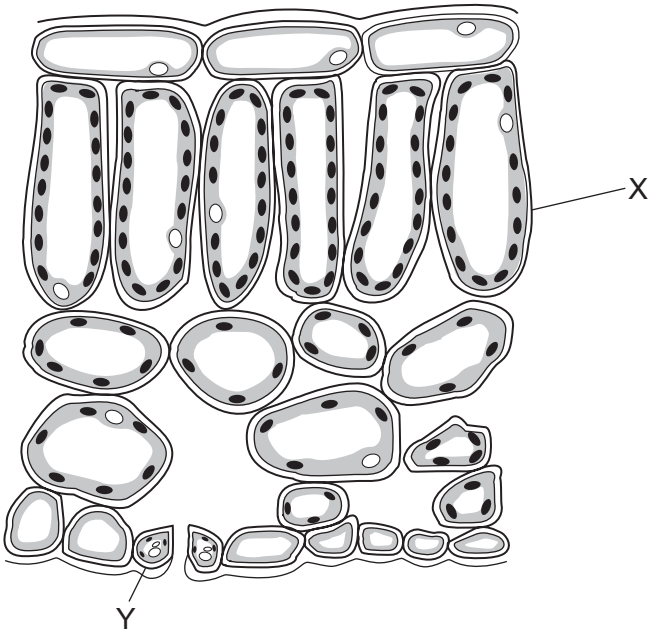
**C** cytoplasm

**D** vacuole

© UCLES 2018

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

View solution




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?

View solution

**A** active transport

**B** diffusion

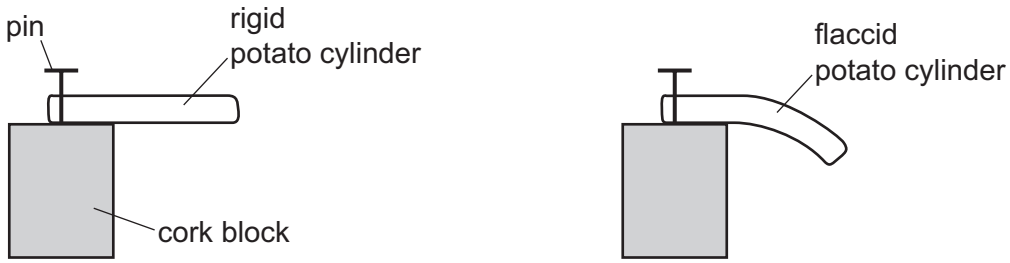
**C** respiration

**D** transpiration

© UCLES 2018

**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.

View solution




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

View 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 |

View solution

**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.

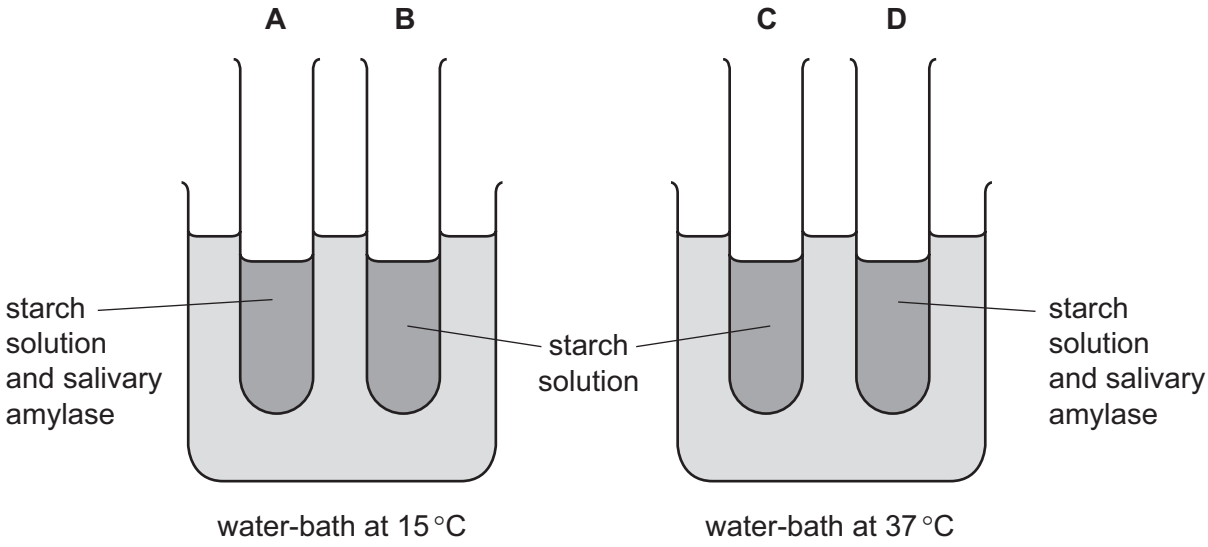
**D** It forms a single helix.

© UCLES 2018

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

View solution

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




**10** A student wrote some notes about enzymes.

View solution

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 |

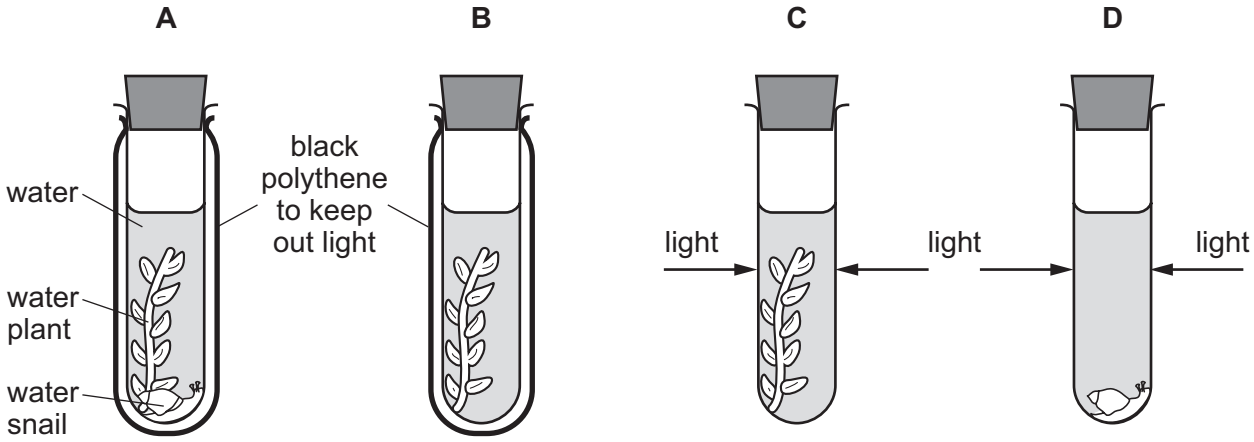
© UCLES 2018

**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.

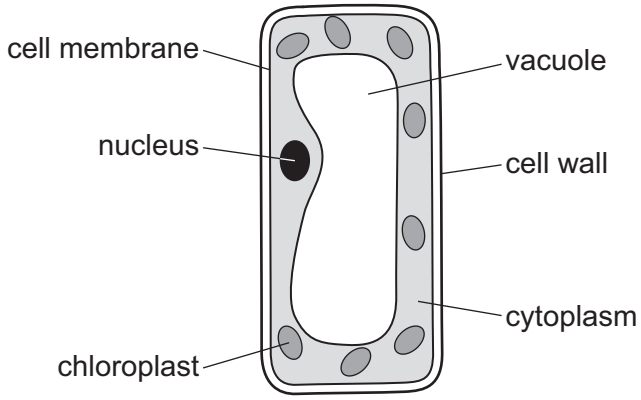
View solution

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




View solution

**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

View solution

**13** What is the result of a diet lacking iron?

**A** bleeding gums

**B** poor wound healing

**C** reduced number of red blood cells

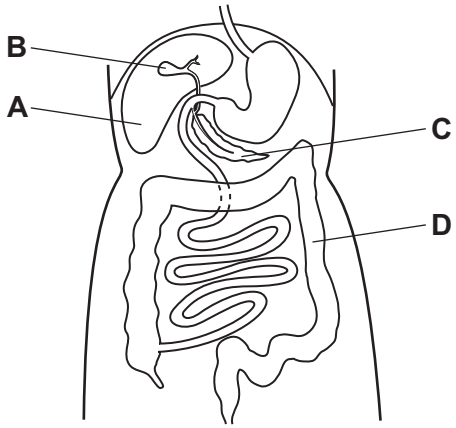
**D** weak bones and teeth

© UCLES 2018

**14** The diagram shows part of the alimentary canal.

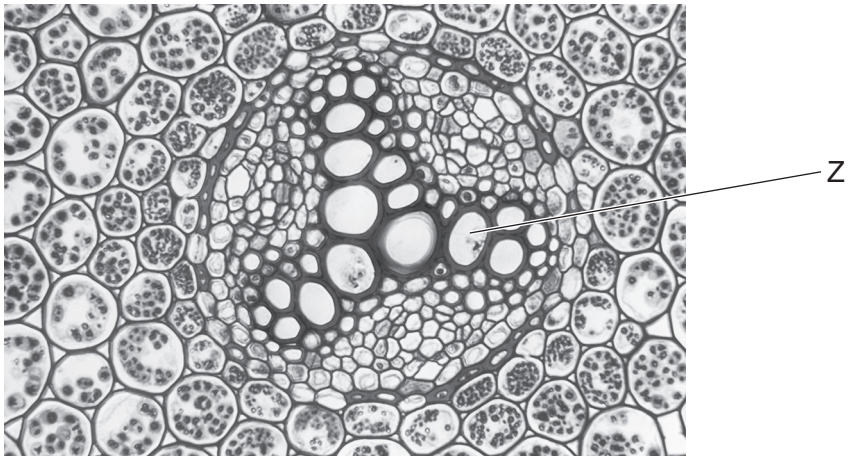
View solution

Which structure produces lipase?




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

View solution




What is the function of the tissue labelled Z?

**A** site of photosynthesis

**B** site of respiration

**C** transport of sugars

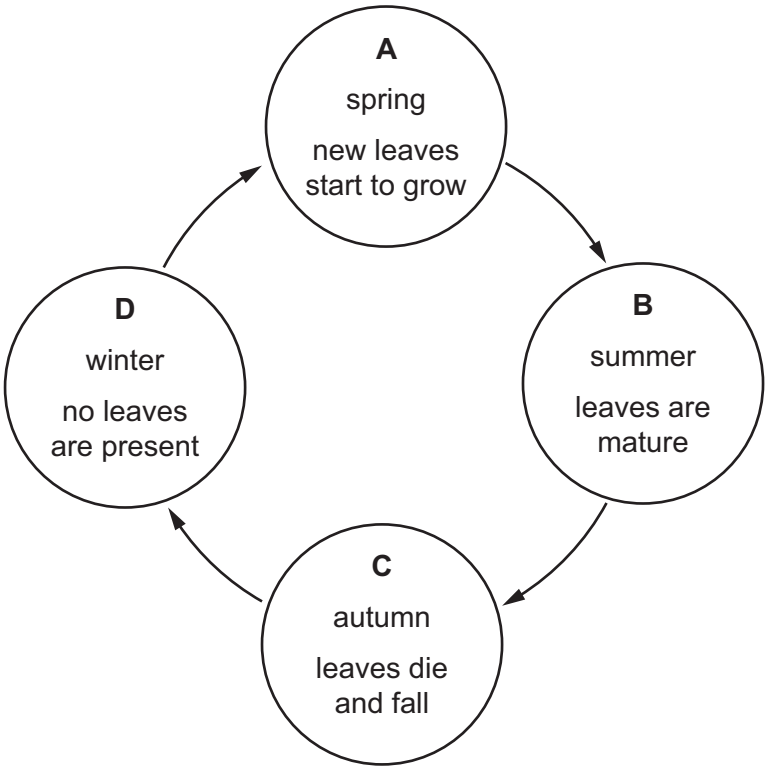
**D** transport of water

© UCLES 2018

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

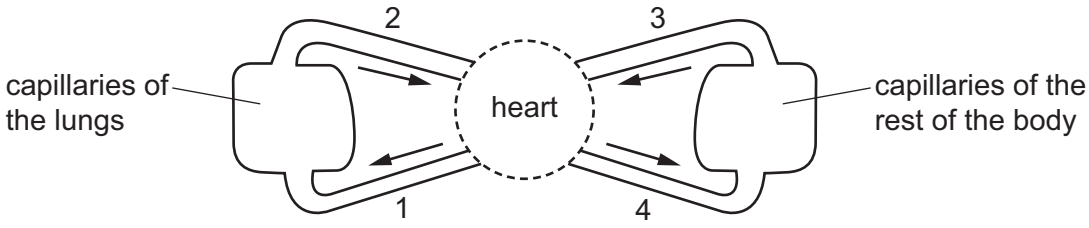
View solution

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




**17** The diagram shows a circulatory system.

View solution




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?

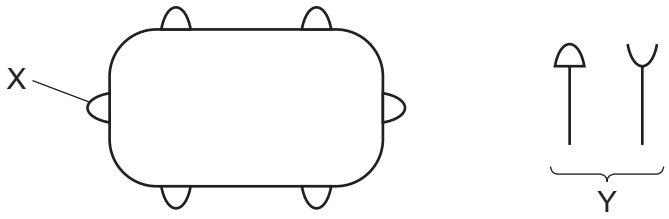
View solution

| | atrioventricular valves | semilunar valves |
|---|---|---|
| **A** | valves close | valves close |
| **B** | valves close | valves open |
| **C** | valves open | valves close |
| **D** | valves open | valves open |

© UCLES 2018

**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.

View solution



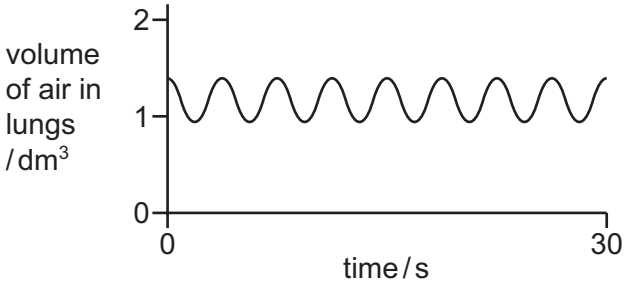

Which row shows the correct combination for destroying the bacterium?

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

© UCLES 2018

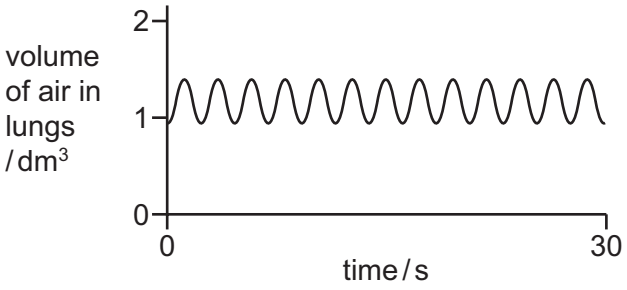
**20** The graph shows changes in the volume of air in the lungs of a person at rest, over a period of 30 seconds.

View solution

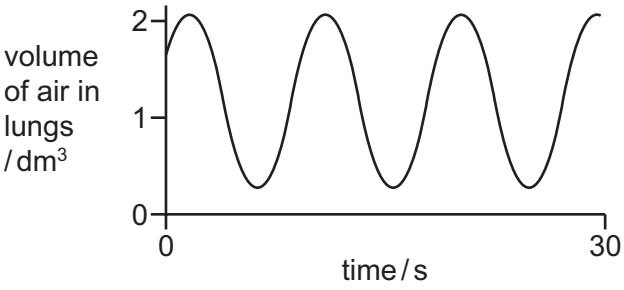



Which graph shows changes in the volume of air in the lungs of the same person immediately after they have done five minutes of vigorous exercise?

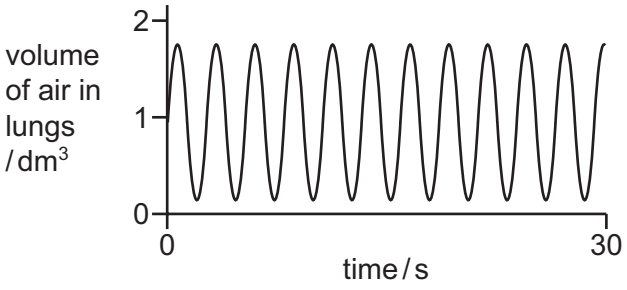
**A**



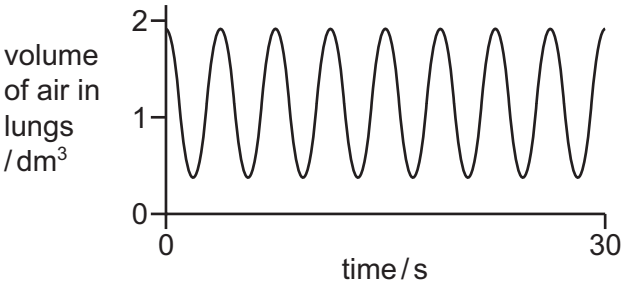

**B**




**C**




**D**




**21** What is produced by anaerobic respiration in mammals?

View solution

**A** alcohol + carbon dioxide

**B** alcohol + oxygen

**C** lactic acid + carbon dioxide

**D** lactic acid

© UCLES 2018

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

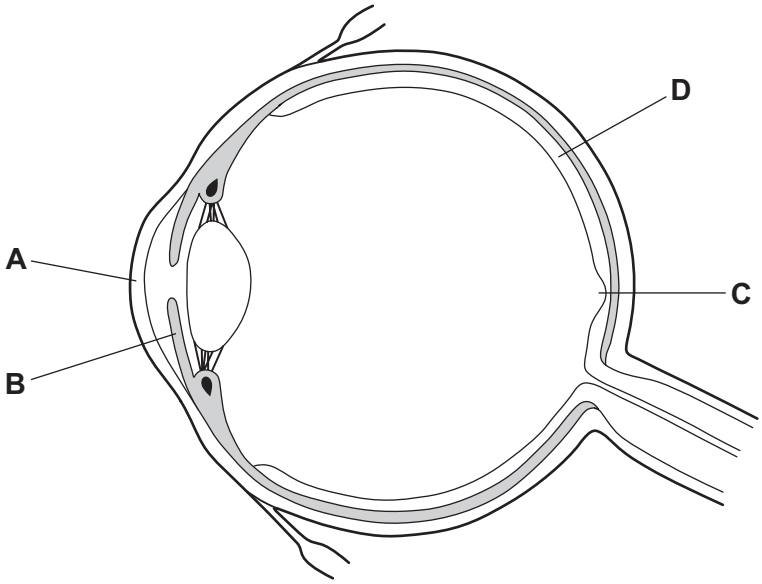
View solution

| | 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.

View solution

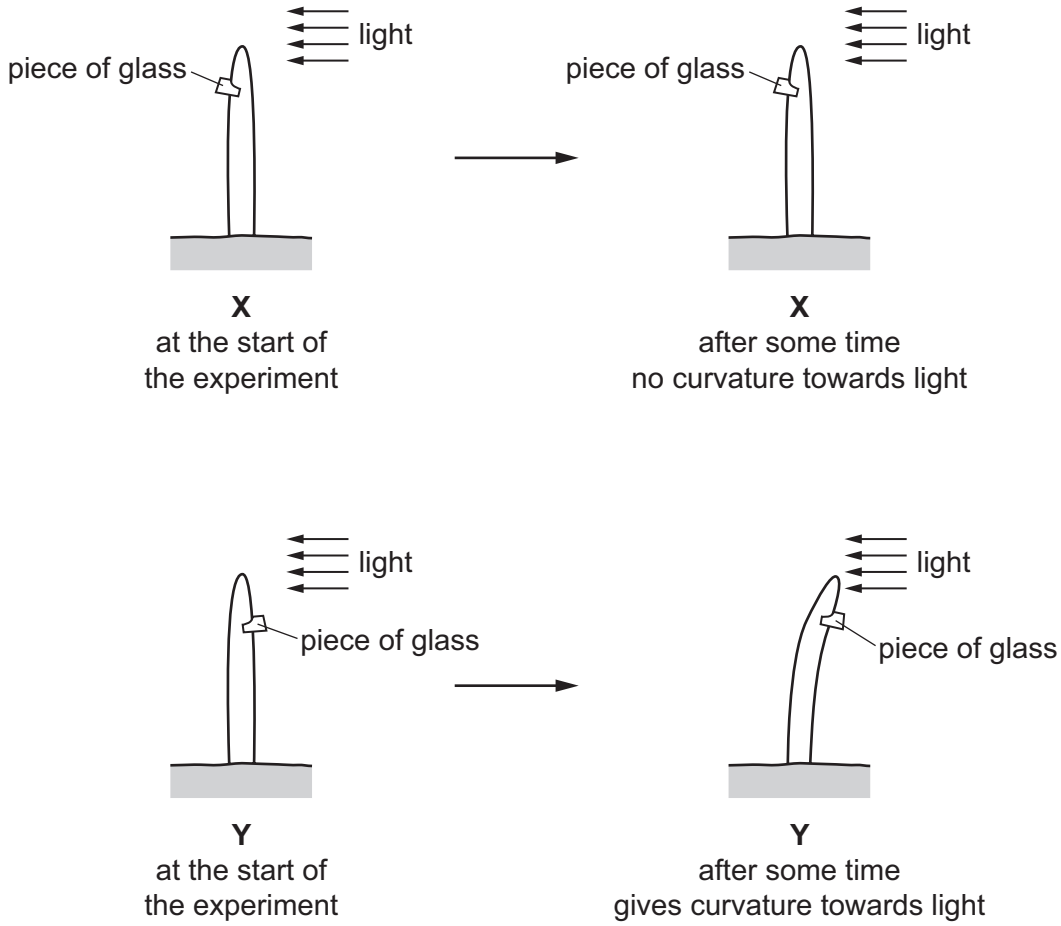
Which structure refracts light?



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

View solution

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.

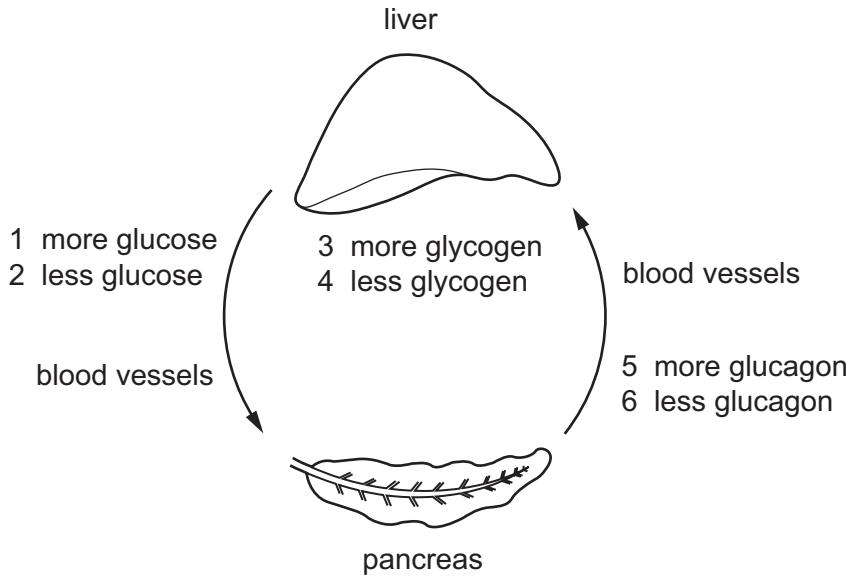
**C** The piece of glass in **X** stopped the auxin travelling down the shaded side of the seedling.

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

© UCLES 2018

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

View solution



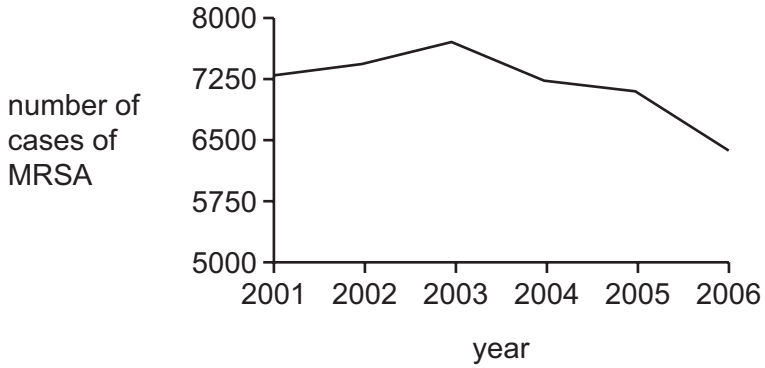

A person does one hour of exercise.

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.

View solution




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?

View solution

| | 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?

View solution

**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?

View solution

**A** adrenal gland

**B** ovary

**C** placenta

**D** uterus

**30** What is the role of mRNA?

View solution

**A** assembles amino acids into protein molecules

**B** carries a copy of the gene out of the nucleus

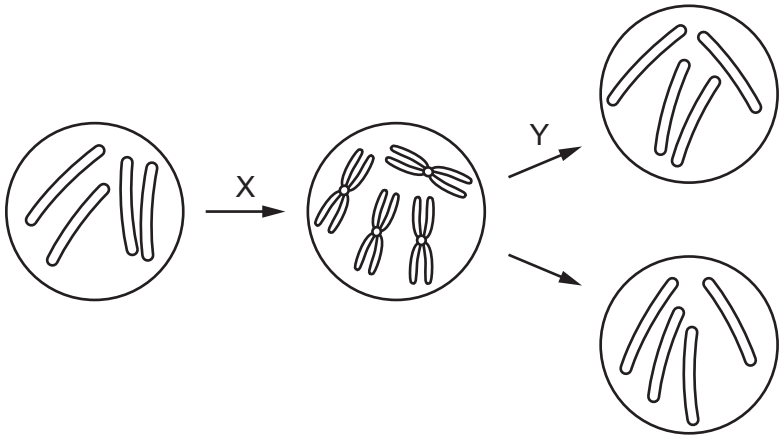
**C** controls cell function by controlling the production of proteins

**D** duplicates chromosomes before mitosis

© UCLES 2018

**31** The diagram shows the formation of new diploid cells.

View solution




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.

View solution

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 $I^oI^o$

View solution

**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 $Hb^SHb^S$.

© UCLES 2018

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

What is the reason for this?

View solution

**A** artificial selection

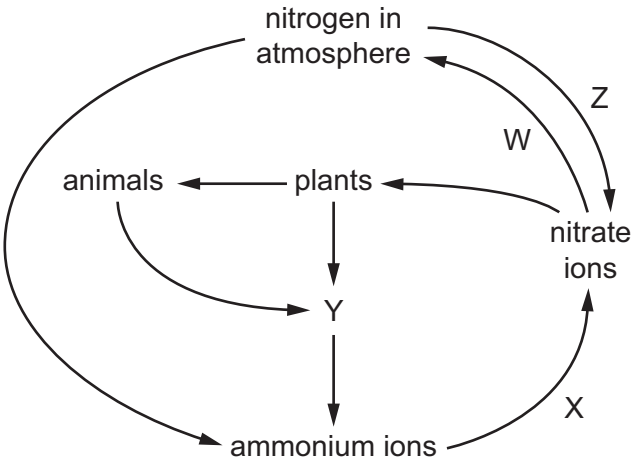
**B** asexual reproduction

**C** more effective new antibiotics

**D** natural selection

**35** The diagram shows part of the nitrogen cycle.

View solution




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

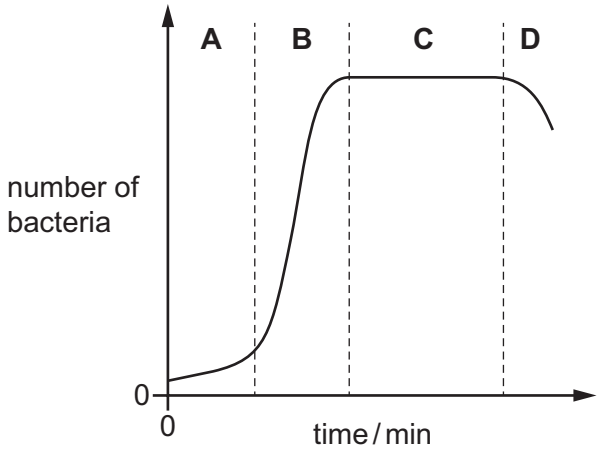
| | W | X | Y | Z |
|---|---|---|---|---|
| **A** | denitrifying | decomposer | nitrifying | nitrogen-fixing |
| **B** | denitrifying | nitrifying | decomposer | nitrogen-fixing |
| **C** | nitrifying | decomposer | nitrogen-fixing | denitrifying |
| **D** | nitrogen-fixing | nitrifying | decomposer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

© UCLES 2018

**36** The graph shows a bacteria population curve.

View solution

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.

View solution

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?

View solution

**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?

View solution

**A** increase in flooding

**B** increase in species

**C** loss of habitats

**D** loss of soil

© UCLES 2018

**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?

View solution

**A** They are lightweight.

**B** They are non-biodegradable.

**C** They are non-reactive.

**D** They are toxic.

**BLANK PAGE**

**BLANK PAGE**

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.