Cambridge International Examinations
Cambridge Ordinary Level

BIOLOGY **5090/11**

Paper 1 Multiple Choice **May/June 2018**

1 hour

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 document consists of **16** printed pages.

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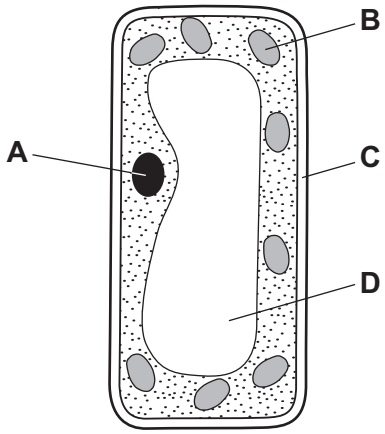
1 The diagram shows a palisade cell.

Which structure is the site of photosynthesis?



2 Which process needs energy from respiration?

A movement of carbon dioxide into the alveoli

B movement of oxygen into red blood cells

C uptake of glucose by cells in the villi

D uptake of water by root hair cells

3 A plant is growing in a fertile, well-watered soil. It is absorbing nitrate ions by active transport and water by osmosis.

How do the concentrations of nitrate ions and water in the plant's roots compare to the concentrations in the soil?

	concentration of nitrate ions in the roots	concentration of water in the roots
A	higher	higher
B	higher	lower
C	lower	higher
D	lower	lower

4 In an enzyme's action, where is the active site and where are the lock and the key?

	active site	lock	key
A	on the enzyme	on the enzyme	on the substrate
B	on the enzyme	on the substrate	on the enzyme
C	on the substrate	on the enzyme	on the substrate
D	on the substrate	on the substrate	on the enzyme

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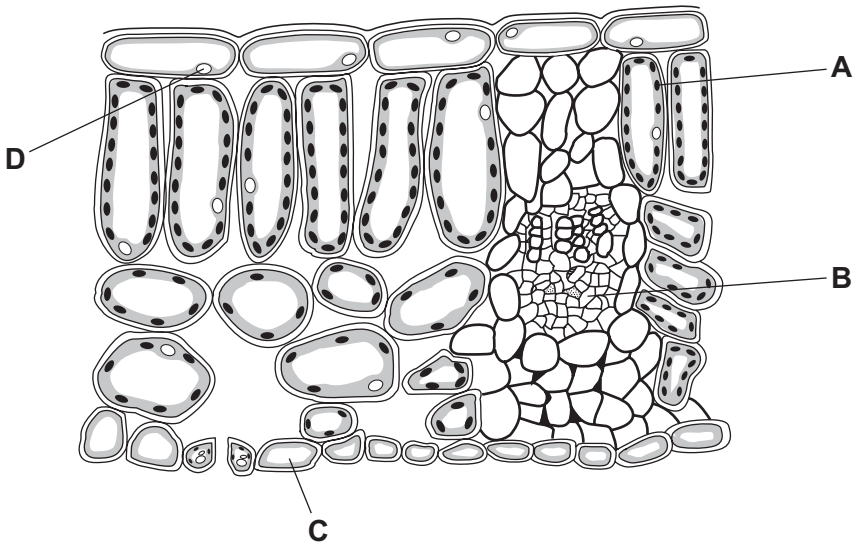
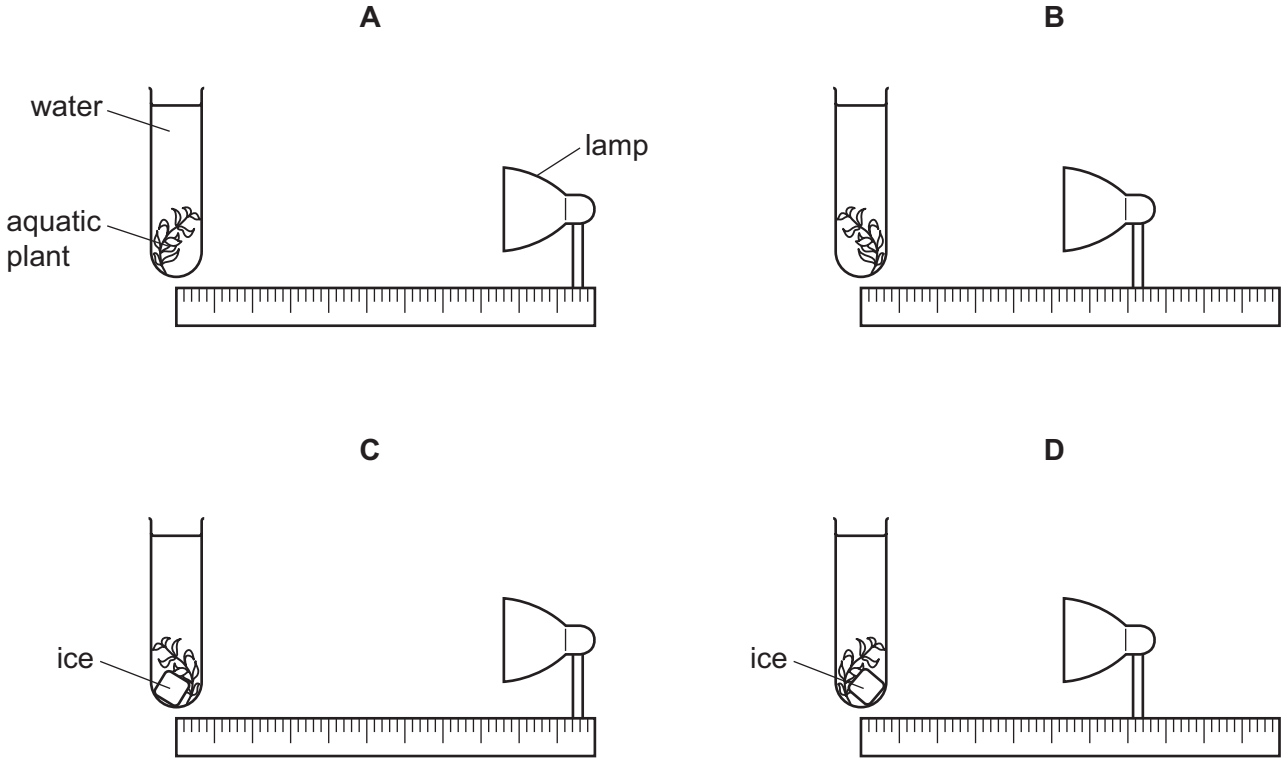
5 The diagram represents a cross-section of part of a leaf as seen using a microscope.

Where does translocation (movement of sucrose and amino acids) occur?



6 The diagrams show an experiment to find the rate of photosynthesis in an aquatic plant in different conditions.

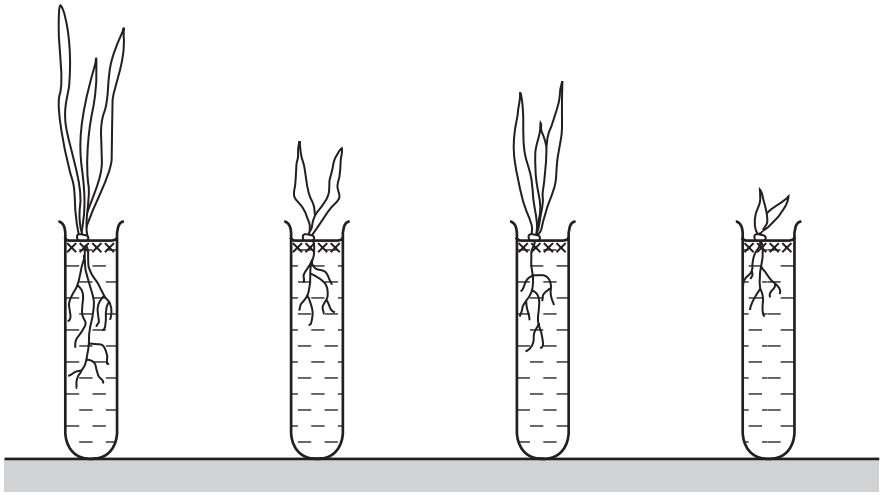
Which plant produces the most bubbles per minute?



7 A student grows seedlings in four different test-tubes.

Tube W contains all the mineral ions needed for healthy plant growth.

The diagram shows the appearance of these seedlings after two weeks.



W	X	Y	Z
healthy growth	little growth	poor growth and yellow leaves	hardly any growth

What do tubes X, Y and Z contain?

	X	Y	Z
A	all minerals except magnesium ions	all minerals except nitrate ions	water
B	all minerals except magnesium ions	water	all minerals except nitrate ions
C	all minerals except nitrate ions	all minerals except magnesium ions	water
D	water	all minerals except magnesium ions	all minerals except nitrate ions

8 Which substance is built up from amino acids?

A glucose

B glycogen

C protein

D urea

9 Where does bile enter the alimentary canal?

A colon

B duodenum

C ileum

D stomach

10 The surface area of the small intestine is increased by the villi in the intestine wall.

How does the increased surface area help absorption of digested materials?

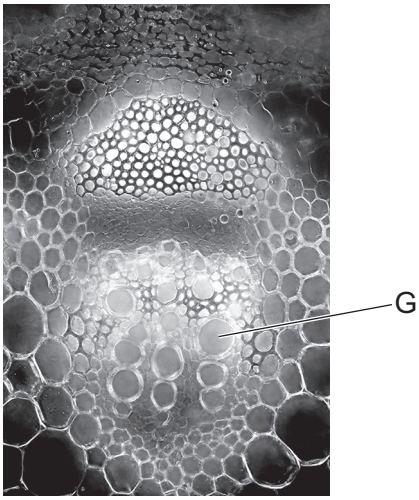
A It makes peristalsis more efficient.

B More mucus is produced for lubrication.

C More starch and protein can be absorbed.

D There is a greater chance of food molecules diffusing into the blood.

11 The photograph shows the cells of a vascular bundle from a stem, as seen using a microscope.



What is tissue G, and what is its function?

	tissue	function
A	phloem	transports sugars to the roots
B	phloem	transports water to the leaves
C	xylem	transports sugars to the roots
D	xylem	transports water to the leaves

12 When plants are growing in soil saturated with water, their roots lack oxygen.

How will the functions of root hairs be affected in these conditions?

	uptake of nitrate ions	uptake of water
A	slowed down	slowed down
B	slowed down	unaffected
C	unaffected	slowed down
D	unaffected	unaffected

13 Which blood vessel transports blood into the liver?

A hepatic portal vein

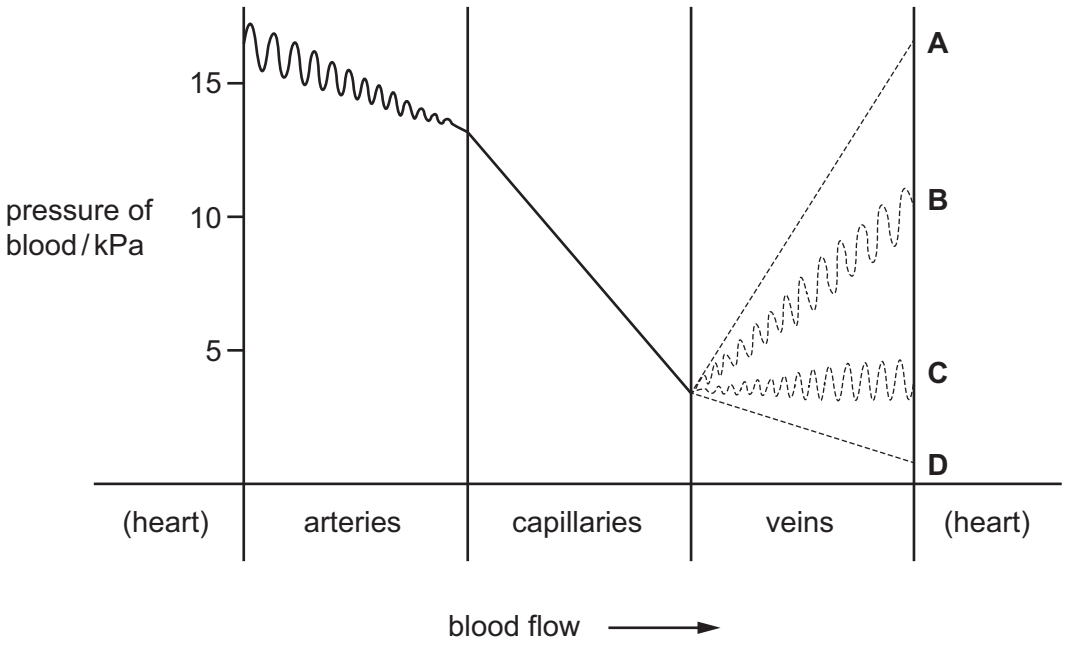
B hepatic vein

C pulmonary vein

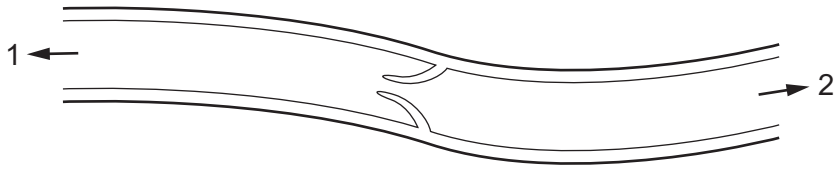
D renal vein

14 The diagram shows the blood pressure of a person at rest as the blood leaves the heart and passes through arteries and then capillaries.

Which line shows the pressure of blood as it flows through veins before returning to the heart?



15 The diagram shows a section through part of a vein.



What could be the first organs found in the directions 1 and 2?

	1	2
A	heart	brain
B	intestine	liver
C	kidney	heart
D	lung	heart

16 Which word equation describes the respiration that occurs in an athlete's muscle cells **before** the start of a race?

A carbon dioxide + water → glucose + oxygen

B glucose → alcohol + carbon dioxide

C glucose → lactic acid

D oxygen + glucose → carbon dioxide + water

17 Yeast is used in bread-making.

Why does the bread contain little or no alcohol?

A Alcohol is not produced by the yeast.

B Sugar is not used by the yeast.

C The alcohol evaporates during baking.

D The yeast produces lactic acid.

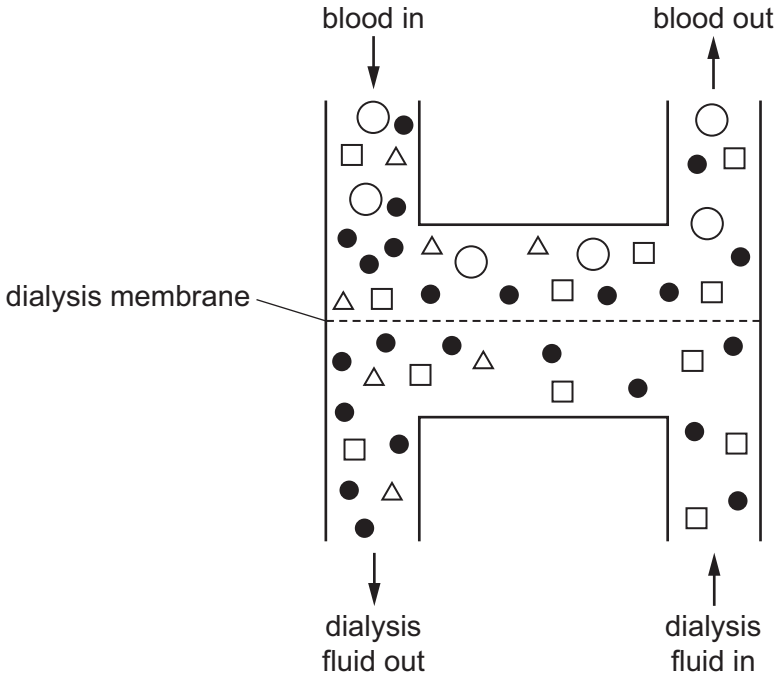
18 The table shows the effect of exercise on the rate and depth of breathing.

	breathing rate / breaths per minute	volume of each breath / cm^3
at rest	12	500
after exercise	24	1000

What is the increase in the volume of air exchanged per minute after exercise, compared to at rest?

A 1000 cm^3 **B** 6000 cm^3 **C** 18 000 cm^3 **D** 24 000 cm^3

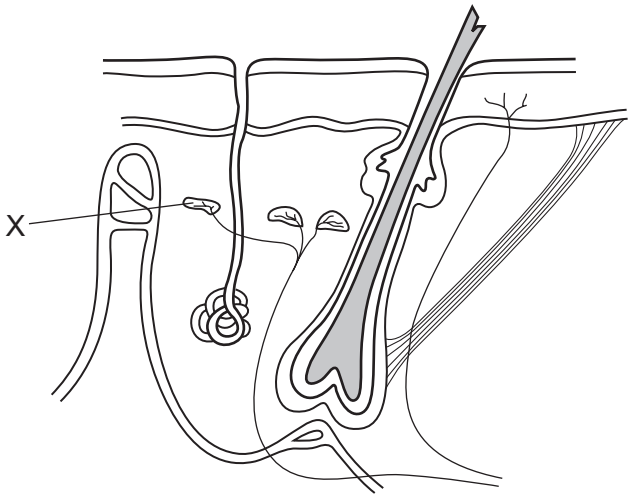
19 The diagram shows how a kidney dialysis machine works. Each shape represents a molecule found in blood or dialysis fluid.



Which shape represents urea?

A ○ **B** ● **C** □ **D** △

20 The diagram shows some of the structures seen in a section through human skin.



What is the function of structure X?

A to cause capillaries to constrict

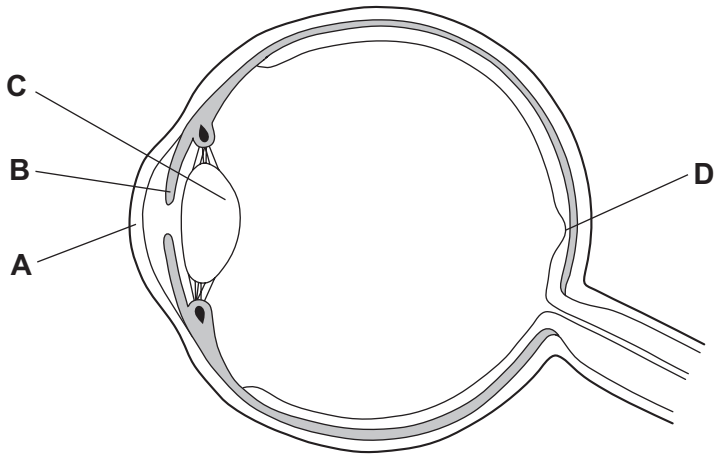
B to detect changes in temperature

C to receive impulses from the central nervous system

D to stimulate sweat glands to release sweat

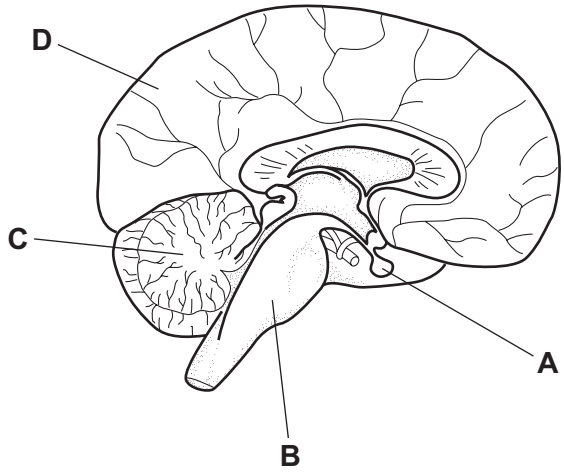
21 The diagram shows a section through an eye.

Which part is the receptor for the stimulus that results in a change in the size of the pupil?



22 The diagram shows the brain in vertical section.

Which structure co-ordinates the menstrual cycle?



23 Which of these is a reflex action?

A increasing the blood glucose level by eating rice

B lifting a book off the table by contracting your arm muscles

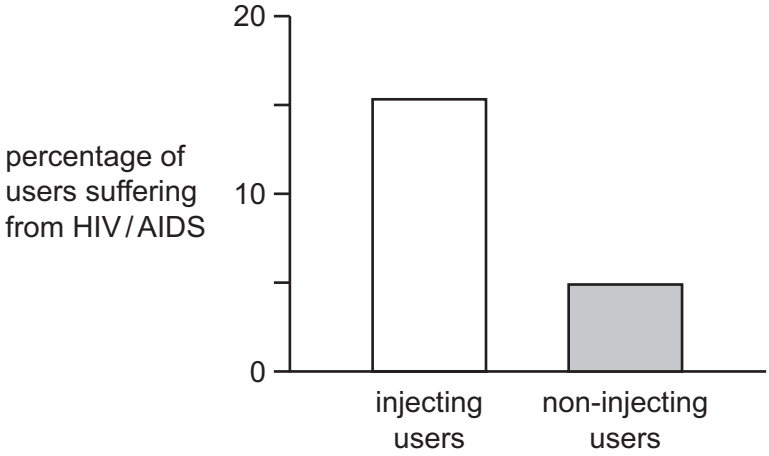
C preventing an insect from flying into your eye by blinking

D using your brain to work out the answer to a problem

24 Which bones meet at the elbow joint and what kind of movement do they allow?

	bones	movement
A	humerus and scapula	in one plane only
B	humerus and scapula	in three planes
C	ulna and humerus	in one plane only
D	ulna and humerus	in three planes

25 The diagram shows the percentages of injecting and non-injecting drug users who suffer from HIV / AIDS in a particular part of the world.



What accounts for the difference between the two groups of drug users?

A Condoms are used more often by injecting drug users.

B Injecting drugs is more common in areas of dense population.

C The same needle may be used by several injecting drug users.

D There are more injecting drug users than non-injecting drug users in this part of the world.

26 Penicillin is produced by the fungus *Penicillium*. The stages involved are listed.

1 Corn and yeast are added to the fungus.

2 Penicillin is extracted.

3 Penicillin is secreted by the fungus.

4 The product is filtered.

What is the sequence of these stages?

A 1 → 3 → 4 → 2

B 2 → 3 → 1 → 4

C 3 → 1 → 2 → 4

D 4 → 3 → 1 → 2

27 Which table shows the features of bacteria, fungi and viruses?

A	feature	bacteria	fungi	viruses
	cell membrane	✓	✓	✓
	cell nucleus	✓	✗	✗
	cell wall	✓	✓	✗

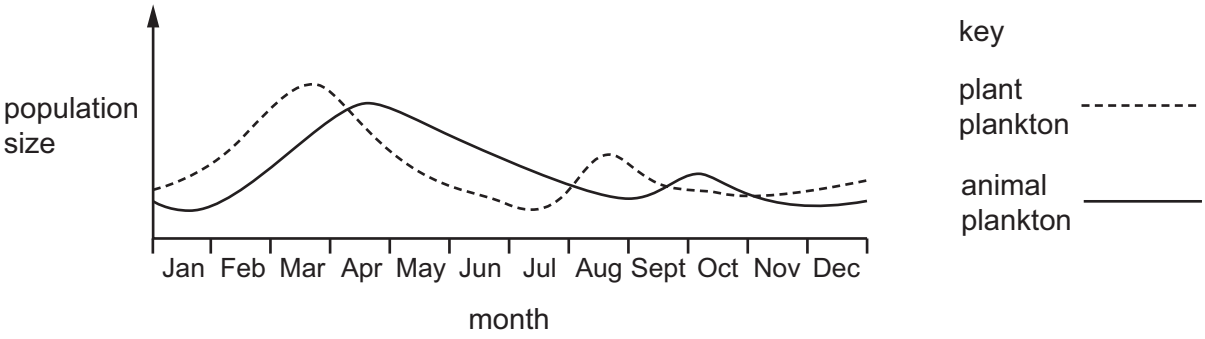
key
✓ = yes
✗ = no

B	feature	bacteria	fungi	viruses
	cell membrane	✓	✓	✗
	cell nucleus	✓	✗	✗
	cell wall	✓	✗	✗

C	feature	bacteria	fungi	viruses
	cell membrane	✓	✗	✓
	cell nucleus	✗	✓	✗
	cell wall	✓	✓	✓

D	feature	bacteria	fungi	viruses
	cell membrane	✓	✓	✗
	cell nucleus	✗	✓	✗
	cell wall	✓	✓	✗

28 The graph shows changes in the populations of plant and animal plankton in a lake.



Consider the following statement in relation to the data provided by the graph.

'Population changes in animal plankton lag behind similar changes in plant plankton because the animals feed on the plants.'

Into which category does the statement fall?

A It is a reasonable interpretation of the data.

B It is a restatement of the data, not an interpretation.

C It is contradicted or not supported by the data.

D More data are required in order for this interpretation to be made.

29 Which sequence is a food chain?

A decomposer → carnivore → producer → herbivore

B decomposer → herbivore → producer → consumer

C producer → herbivore → carnivore → carnivore

D producer → producer → consumer → decomposer

30 Which stage of the carbon cycle depends on the presence of bacteria and fungi in the soil?

A combustion

B decomposition

C photosynthesis

D respiration

31 Which term correctly describes the malarial pathogen?

A bacterium

B insect

C parasite

D vector

32 Which two air pollutants contribute to acid rain?

A carbon dioxide and methane

B oxygen and oxides of nitrogen

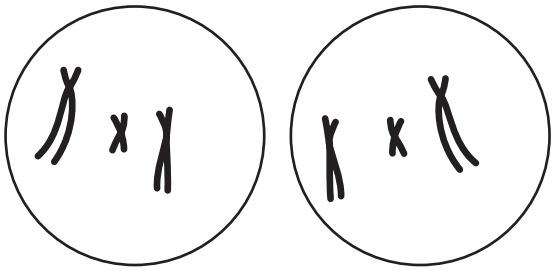
C sulfur dioxide and methane

D sulfur dioxide and oxides of nitrogen

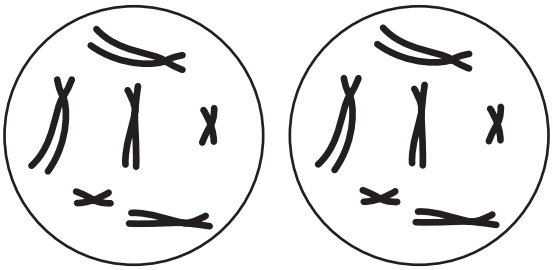
33 The diagram shows the chromosomes in a cell.

Which diagram shows the product of **one** division of the cell by mitosis?

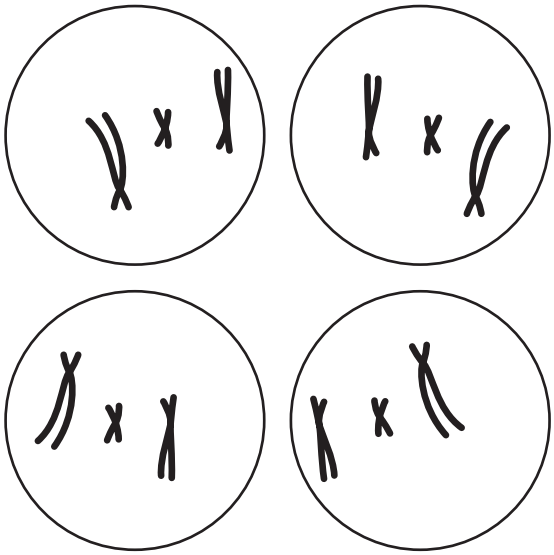
A



B



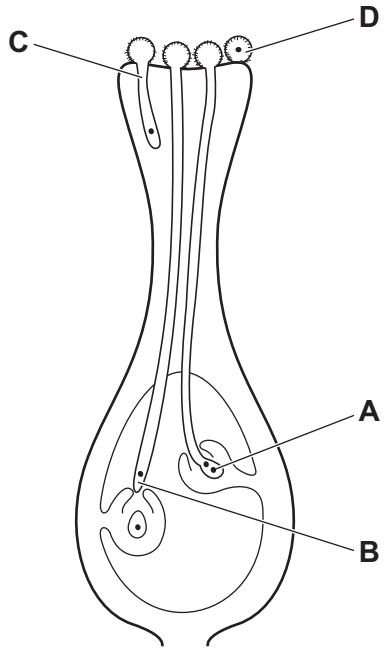
C



D

34 The diagram shows the stigma, style and ovary of a flower.

Where does fertilisation take place?



35 In which part of the human female reproductive system does a zygote start to divide to form a ball of cells?

A cervix

B ovary

C oviduct

D uterus

36 What is the **best** way to prevent the spread of the human immunodeficiency virus (HIV)?

A Always keep fit by taking regular exercise.

B Do not drink from a cup that has been used by an infected person.

C Have regular tests for HIV infection.

D Use condoms during sexual intercourse.

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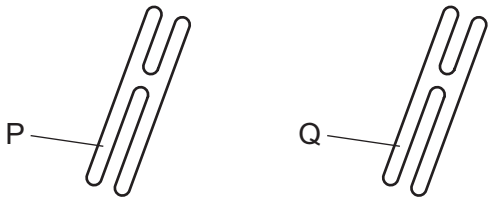
37 The diagram shows a pair of chromosomes from the same cell.



A gene is found at the point labelled P.

In a heterozygous individual, what will be found at the equivalent position labelled Q?

A a different allele of a different gene

B a different allele of the same gene

C a different gene of the same allele

D the same gene of the same allele

38 Which characteristics show continuous and discontinuous variation in humans?

	continuous variation	discontinuous variation
A	blood groups	skin colour
B	free or attached ear lobes	blood groups
C	height	free or attached ear lobes
D	intelligence	hair colour

39 Which statements about natural selection are correct?

	natural selection can lead to better adapted species surviving	natural selection can lead to extinction of a species	natural selection can lead to gene mutations occurring
A	true	true	true
B	true	true	false
C	true	false	true
D	false	true	true

40 Which statements about genetically engineered plants show potential benefits?

1 The increased yield from genetically engineered plants allows a smaller area of land to be farmed.

2 Genetically engineered plants may have improved nutritional value.

3 Some plants can be genetically modified to give resistance to diseases.

4 Cross-pollination with weeds could produce new varieties of weeds.

5 The use of genetically engineered crops may explain the increase in allergies in children.

6 There is more research needed on the long term effects of genetically engineered crops on the environment.

A 1, 2 and 3 **B** 1, 5 and 6 **C** 2, 3 and 4 **D** 4, 5 and 6

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