Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/22**

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)

3397490337

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 A person drinks a glass of iced water and the volume of sweat they secrete decreases.

This is an example of which characteristic of living organisms?

A growth

B movement

C respiration

D sensitivity

2 Lichens are formed from two different organisms living together.

The table shows some of the characteristics of two organisms, X and Y, found in most lichens.

X	Y
made of strands called hyphae hyphae have cell walls and many nuclei	single celled cell contains a nucleus and chloroplasts

Which kingdoms are represented by X and Y?

	X	Y
A	Fungus	Plant
B	Fungus	Protoctist
C	Protoctist	Fungus
D	Protoctist	Plant

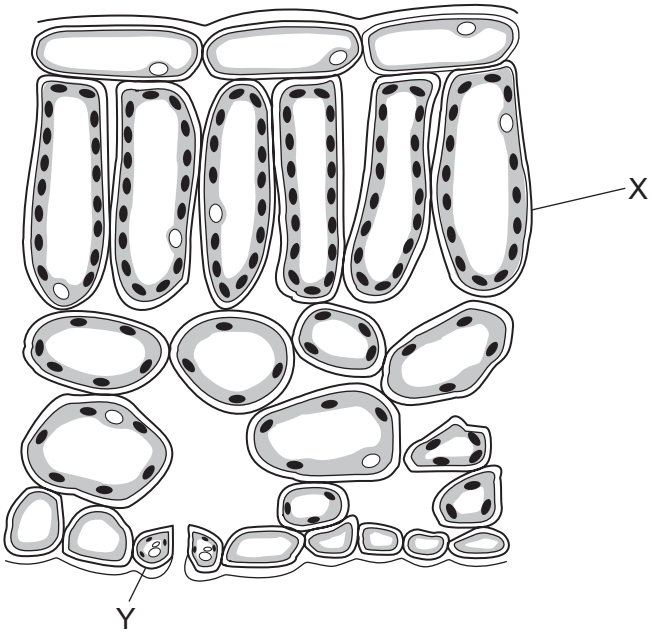
3 Two types of cell, one animal and one plant, were examined using a light microscope.

Which row shows the correct combination of cellular features that would be observed in the cells?

	cell structure observed			
	animal cell		plant cell	
A	chloroplast	membrane	vacuole	cytoplasm
B	cytoplasm	nucleus	chloroplast	membrane
C	membrane	cell wall	cytoplasm	nucleus
D	nucleus	chloroplast	cell wall	membrane

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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

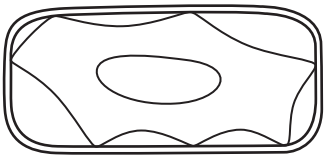
B diffusion

C respiration

D transpiration

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6 The diagram shows a plant cell after it has been submerged in a solution, P, for 20 minutes.



Which row describes the water potential of solution P and the condition of the cell?

	water potential of solution P	condition of the cell
A	higher than the cell sap in the vacuole	plasmolysed and turgid
B	higher than the cell sap in the vacuole	under high turgor pressure
C	lower than the cell sap in the vacuole	plasmolysed and flaccid
D	the same as the cell sap in the vacuole	under low turgor pressure

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 The base sequence of part of one strand of a DNA molecule is shown.

ATAGCC

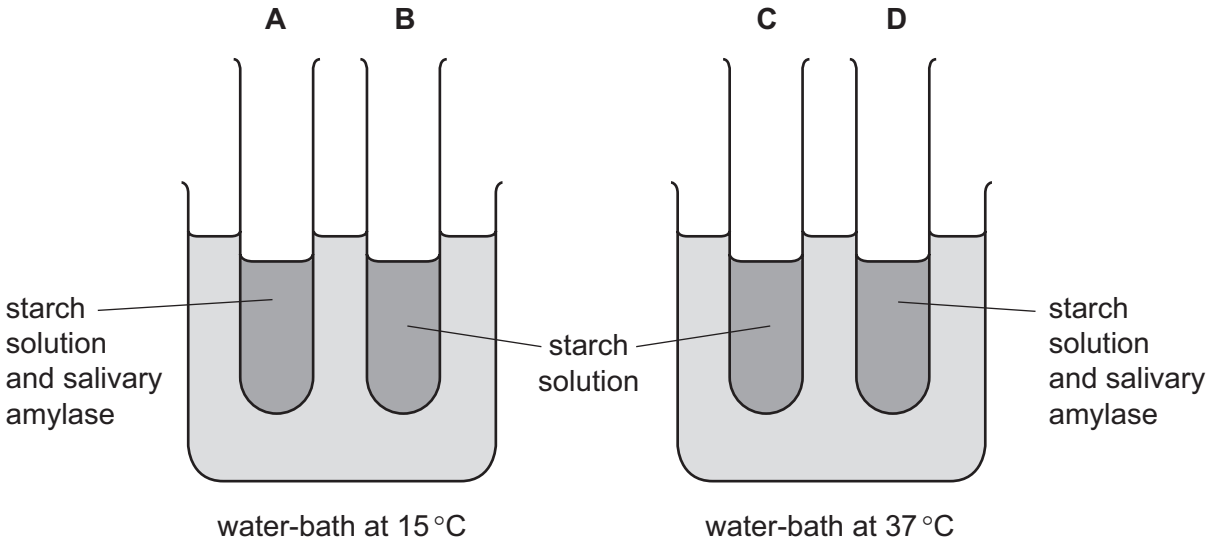
What is the base sequence of the other strand?

A GCGATT **B** CGCTAA **C** TATCGG **D** ATAGCC

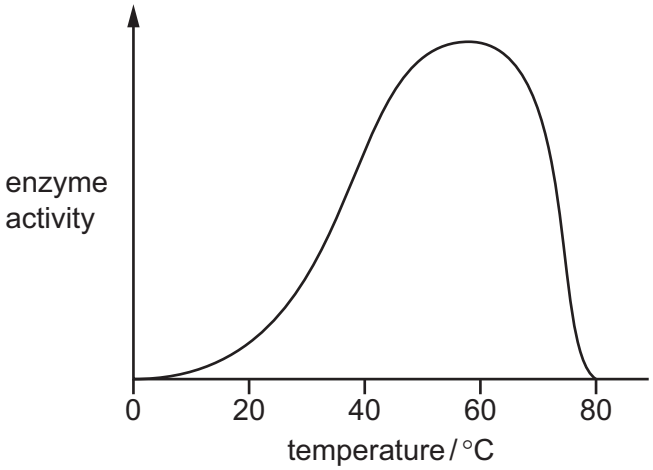
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9 The apparatus shown is used for an experiment on starch digestion.

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



10 The graph shows the effect of temperature on the action of an enzyme.



Why does the rate of reaction change when the temperature is increased from 20 °C to 30 °C?

	more kinetic energy of particles	more frequent collisions of particles
A	✓	✓
B	✗	✓
C	✓	✗
D	✗	✗

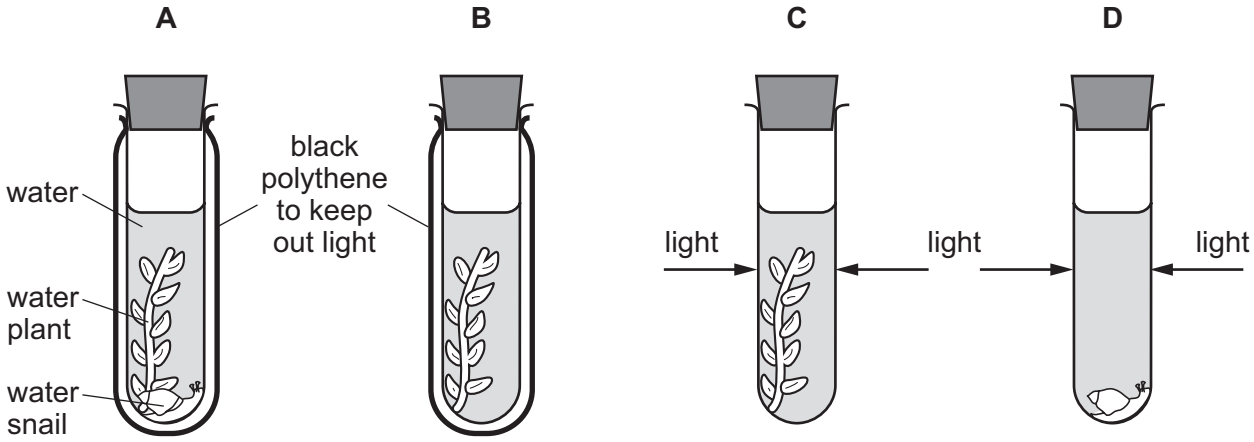
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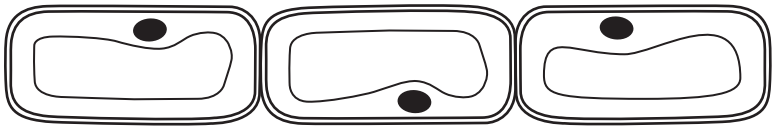
11 An experiment was carried out using the apparatus shown.

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 the structure of cells from the leaf of a plant.



What type of cells are they?

A epidermal cells

B guard cells

C palisade cells

D spongy cells

13 What is the result of a diet lacking iron?

A bleeding gums

B poor wound healing

C reduced number of red blood cells

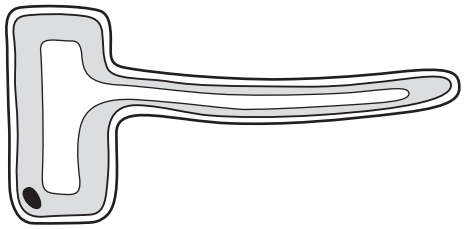
D weak bones and teeth

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14 Which row shows an enzyme with the correct site of production and products?

	enzyme	enzyme produced by	product(s) of digestion
A	amylase	salivary glands	amino acids
B	amylase	stomach	sugar
C	protease	salivary glands	sugar
D	protease	stomach	amino acids

15 The diagram shows a plant cell.



What type of plant cell is this?

A guard cell

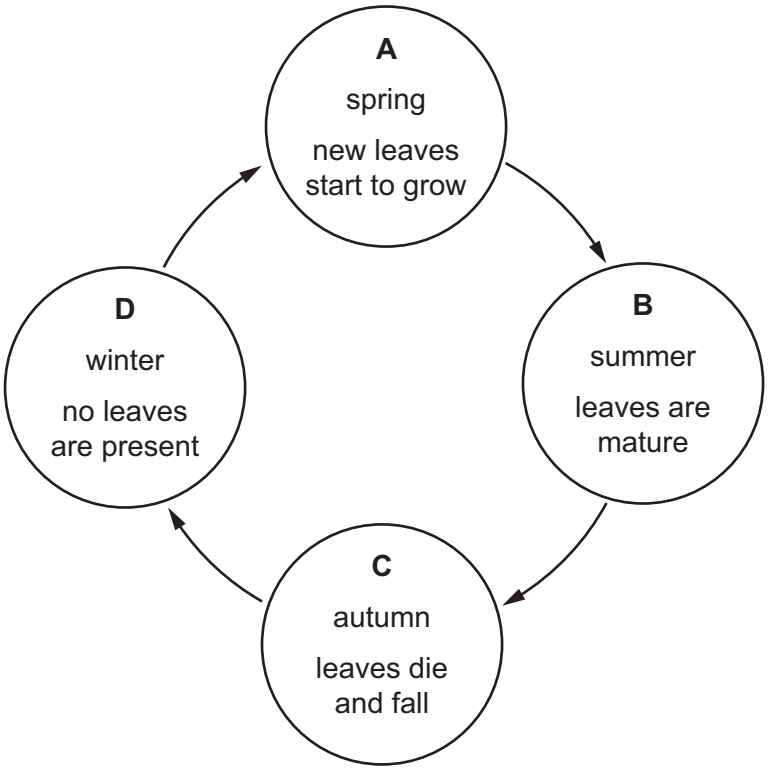
B mesophyll cell

C root cortex cell

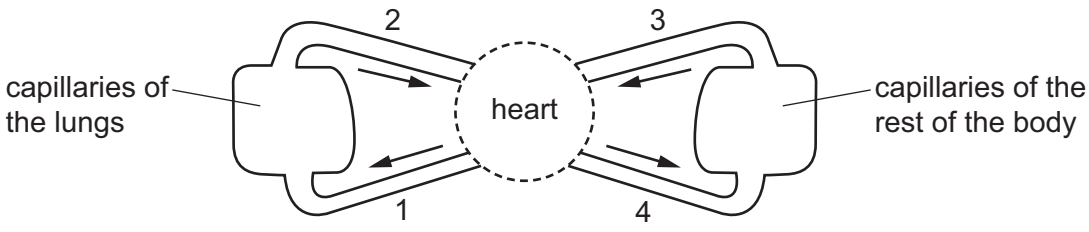
D root hair cell

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?

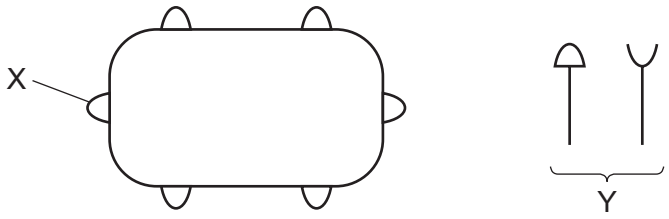
A 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

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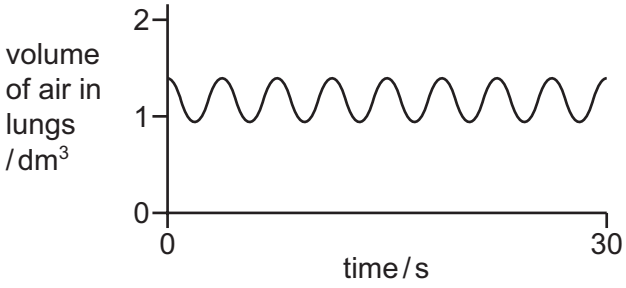
19 The diagram with the structure labelled X shows a bacterium with proteins on its surface. The diagram labelled Y shows proteins made by the human body.



Which row shows the correct combination for destroying the bacterium?

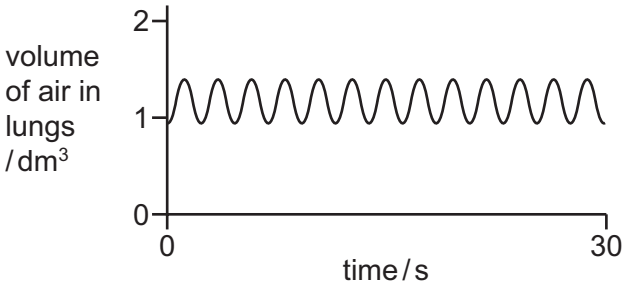
	name of X	name of Y	correct shape of Y
A	antigen	antibody	
B	antibody	antigen	
C	antigen	antibody	
D	antibody	antigen	

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

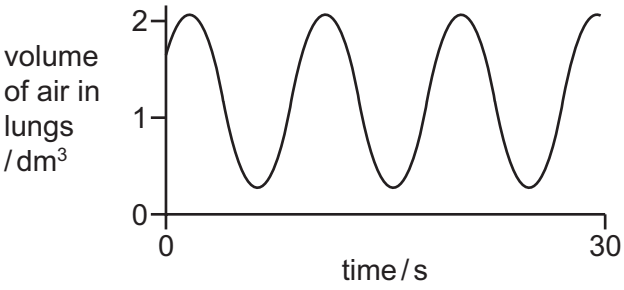


Which graph shows changes in the volume of air in the lungs of the same person immediately after they have done five minutes of vigorous exercise?

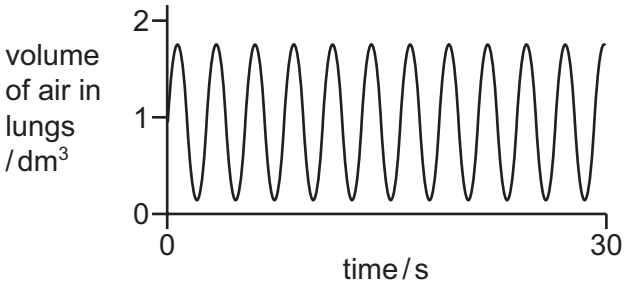
A



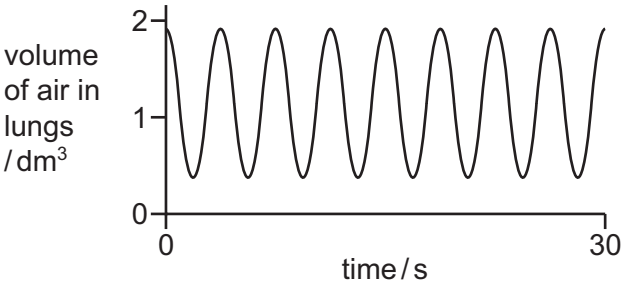
B



C



D



21 As we breathe out, ...1..... is .....2..... through the lungs.

Which words correctly complete gaps 1 and 2?

	1	2
A	carbon dioxide	excreted
B	carbon dioxide	respired
C	oxygen	excreted
D	oxygen	respired

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22 A person carries out vigorous exercise without drinking any water.

What would happen to the concentration and volume of the person's urine immediately after exercise?

	urine concentration	urine volume
A	decrease	decrease
B	decrease	increase
C	increase	decrease
D	increase	increase

23 What does the central nervous system consist of?

A brain, spinal cord and peripheral nerves

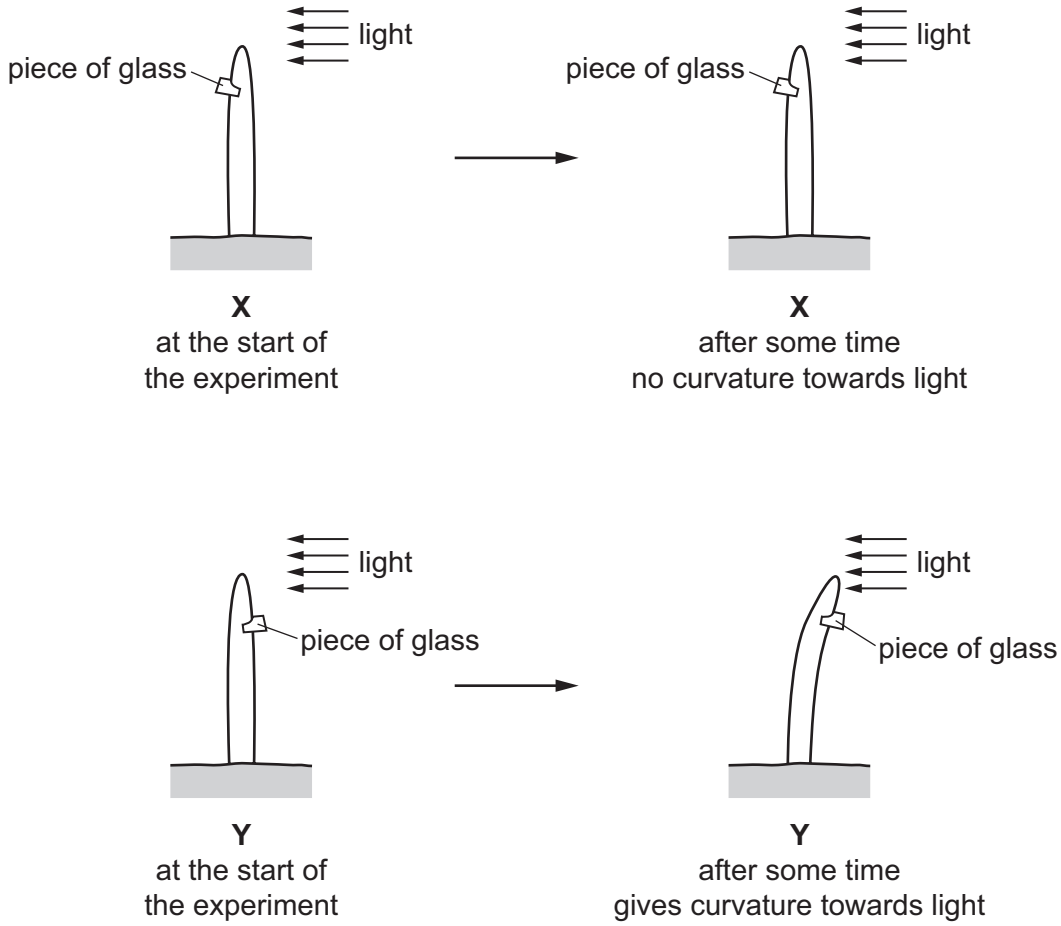
B brain and spinal cord only

C brain only

D spinal cord and peripheral nerves only

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.

25 What is a response to a low concentration of glucose in the blood?

A Glucagon will cause the body to convert glucose into glycogen.

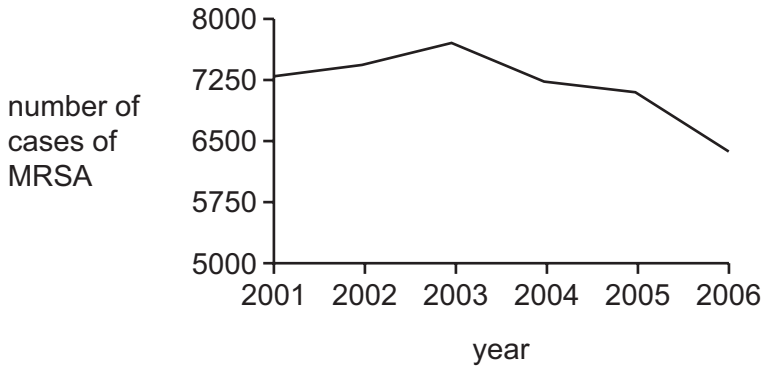
B Glucagon will cause the body to convert glycogen into glucose.

C Insulin will cause the body to convert glucose into glycogen.

D Insulin will cause the body to convert glycogen into glucose.

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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 What are two adaptive features of a human sperm cell?

1 jelly coat present

2 relatively high number of mitochondria

3 acrosome present

4 relatively high energy stores

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

28 Which hormone maintains the thickness of the lining of the uterus during pregnancy?

A follicle stimulating hormone (FSH)

B luteinising hormone (LH)

C oestrogen

D progesterone

29 What is a possible disadvantage of in vitro fertilisation (IVF)?

A Donated eggs and sperm can be used.

B Embryos can be screened for genetic disorders.

C It requires more medical resources.

D Unused embryos can be stored.

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30 A sperm cell from a domestic cat contains 19 chromosomes.

If this cell fertilises an egg, which zygote is produced?

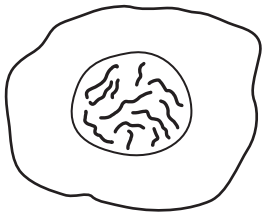
A diploid, with 19 chromosomes

B diploid, with 38 chromosomes

C haploid, with 19 chromosomes

D haploid, with 38 chromosomes

31 The diagram shows a cell of an organism. The nucleus contains 12 chromosomes.



After it divides by mitosis, how many chromosomes would be present in one of the daughter cells?

A 6 **B** 12 **C** 18 **D** 24

32 Pure-breeding black-feathered chickens are mated with pure-breeding white-feathered chickens. All of the individuals in the offspring in the F1 generation have both black and white feathers.

What will be the ratio of offspring phenotypes when two of the F1 generation chickens are crossed?

A 1 black : 1 white

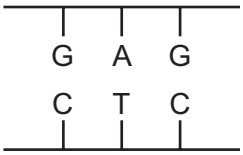
B 1 black : 2 black and white : 1 white

C 3 white : 1 black

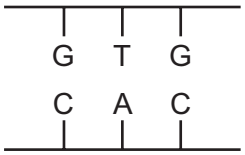
D 3 black : 1 white

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33 The diagram shows the bases on part of a chromosome, P, responsible for the production of normal haemoglobin. The same part of another chromosome, Q, is responsible for the production of sickle-cell haemoglobin.



chromosome P



chromosome Q

What has caused the difference between the two chromosomes?

A discontinuous variation

B gene mutation

C phenotypic variation

D selective breeding

34 Farmers have bred Holstein-Friesian cattle to produce more milk than older breeds of cattle.

Which process was used to produce these cattle?

A adaptation

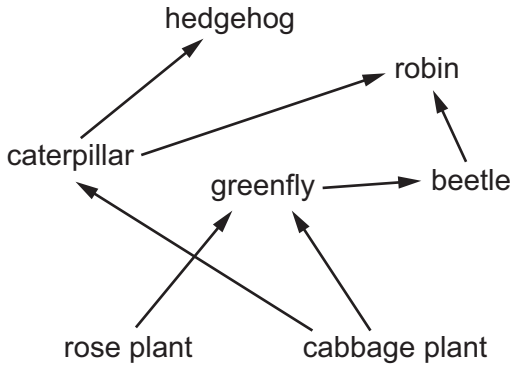
B genetic engineering

C natural selection

D selective breeding

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35 The diagram shows a food web.

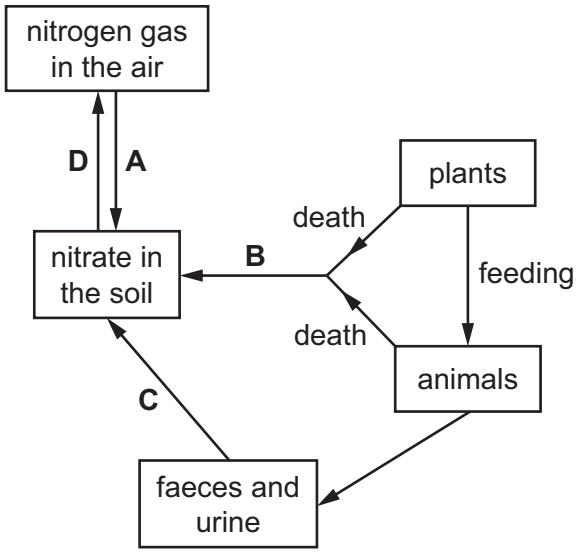


Which row shows a food chain in this food web?

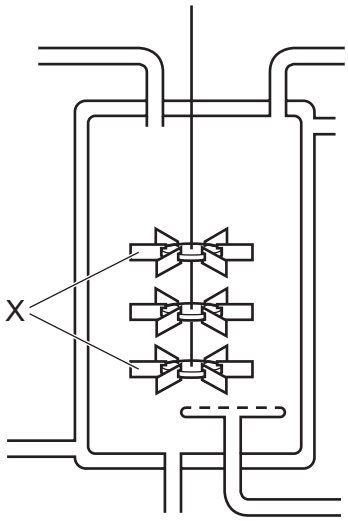
	producer	primary consumer	secondary consumer
A	hedgehog	caterpillar	robin
B	cabbage plant	greenfly	beetle
C	cabbage plant	beetle	robin
D	rose plant	hedgehog	greenfly

36 The diagram shows part of the nitrogen cycle.

Which change is caused by the action of denitrifying bacteria?



37 The diagram shows an industrial fermenter used to produce penicillin.



What is a function of the part labelled X?

A add oxygen to the solution

B maintain an even temperature throughout the solution

C record the pH of the solution

D sterilise the solution

38 Genetic engineering involves various stages.

1 human DNA is inserted into bacterial plasmid DNA

2 recombinant plasmid inserted into bacteria

3 restriction enzyme cuts bacterial plasmid DNA

4 restriction enzyme cuts human DNA

What is the correct sequence for genetic engineering?

A $1 \rightarrow 2 \rightarrow 4 \rightarrow 3$

B $2 \rightarrow 3 \rightarrow 4 \rightarrow 1$

C $3 \rightarrow 2 \rightarrow 4 \rightarrow 1$

D $4 \rightarrow 3 \rightarrow 1 \rightarrow 2$

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39 The statements describe some of the events that occur during eutrophication.

What is directly responsible for the increase in bacteria?

A a decrease in dissolved oxygen concentration

B an increase in nitrate concentration

C an increase in the population of algae

D an increase in the death of producers

40 In 1991 there were only fourteen *Daviesia cunderdin* plants.

What happens to a plant population that becomes very small?

A Each plant will produce fewer offspring.

B Each plant will produce more offspring.

C Variation in the population is increased.

D Variation in the population is reduced.

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