CAMBRIDGE
International Education

Cambridge O Level

BIOLOGY **5090/11**

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

1 hour

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)

1092327449

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

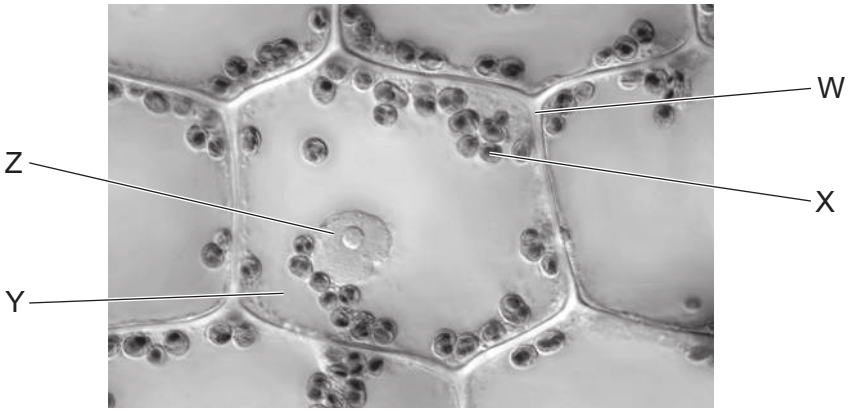
- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.

This document has **16** pages.

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1 The photomicrograph shows *Elodea* cells.



Which row identifies the cell wall, a chloroplast, the cytoplasm and the nucleus?

	cell wall	chloroplast	cytoplasm	nucleus
A	W	X	Y	Z
B	W	Z	Y	X
C	Y	X	W	Z
D	Y	W	Z	X

2 Human liver cells contain, on average, 1500 mitochondria per cell. The volume of a typical liver cell is 11 305 μm^3 and mitochondria occupy 20% of this volume.

What is the average volume of a single liver cell mitochondrion?

A 0.15 μm^3 **B** 1.5 μm^3 **C** 15.0 μm^3 **D** 150 μm^3

3 *Quercus coccifera* and *Quercus petraea* are two types of oak tree.

Which statement describes these two types of tree?

A They belong to different kingdoms.

B They belong to the same species.

C They belong to the same genus.

D They do **not** share any features.

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4 In a practical lesson, a student makes the following observations about some organisms.

'They are spherical, unicellular organisms which are visible with the light microscope.

Cytoplasm is present and, after staining, a nucleus can be seen.

A vacuole is present.'

What is being described?

A bacterium

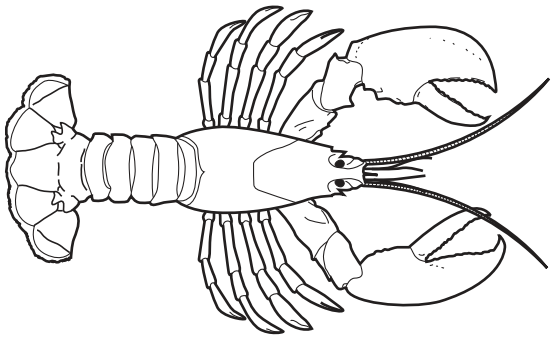
B fungus

C plant

D virus

5 There are four main groups of arthropods. Information about each group is shown.

crustaceans	insects	arachnids	myriapods
• 2 pairs of antennae • more than 4 pairs of legs	• body in 3 parts (head, thorax and abdomen) • 3 pairs of legs • usually 2 pairs of wings	• body in 2 parts • 4 pairs of legs	• head with jaws • long segmented body • legs on each segment • one pair of antennae



Which arthropod group does the organism shown belong to?

A crustacean

B insect

C arachnid

D myriapod

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6 Which statements about diffusion are correct?

1 Molecules move in a random way.

2 Molecules move down a concentration gradient.

3 Molecules may move through a partially permeable membrane.

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

7 The roots of two groups of maize plants are placed in solutions containing radioactive nitrate ions. This enables the movement of the nitrate ions to be tracked.

A chemical that prevents respiration is added to the solution in which the experimental plants are placed.

The second group of plants have no chemical added and act as a control.

At regular intervals, the solutions surrounding the roots are tested for radioactive nitrate ions.

The table shows the results.

time / minutes	**concentration of radioactive nitrate ions in the solutions surrounding the roots (arbitrary units)**	
	control plants	**experimental plants**
0	7.8	7.8
15	3.6	6.9
30	2.9	6.7
60	2.5	6.5
120	1.3	6.5

What is **not** a valid conclusion from the results?

A Active transport takes place in the control plants because respiration is supplying energy.

B Small amounts of nitrate ions enter the experimental plants by diffusion.

C Small amounts of nitrate ions enter the experimental plants by active transport.

D The chemical that prevents respiration reduces the uptake of nitrate ions by maize plants.

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8 What is an example of an organ?

A alveolus

B sperm

C neurone

D kidney

9 Many nutrients can be identified by simple chemical tests.

Which nutrient causes Benedict's solution to change colour to red?

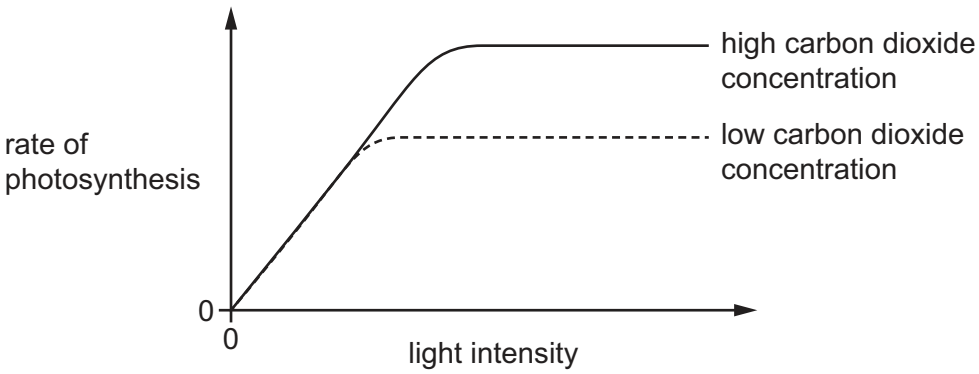
A fat

B protein

C glucose

D starch

10 The graph shows the effect of changing light intensity on the rate of photosynthesis in a plant at two different carbon dioxide concentrations.



Which statement is correct?

A At low light intensities carbon dioxide is the limiting factor.

B At high light intensities carbon dioxide is the limiting factor.

C When the carbon dioxide concentration is high, there is no limiting factor.

D When carbon dioxide concentration is low, the plant cannot photosynthesise.

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11 Plants need magnesium ions to grow.

Which compound in plants contains magnesium ions?

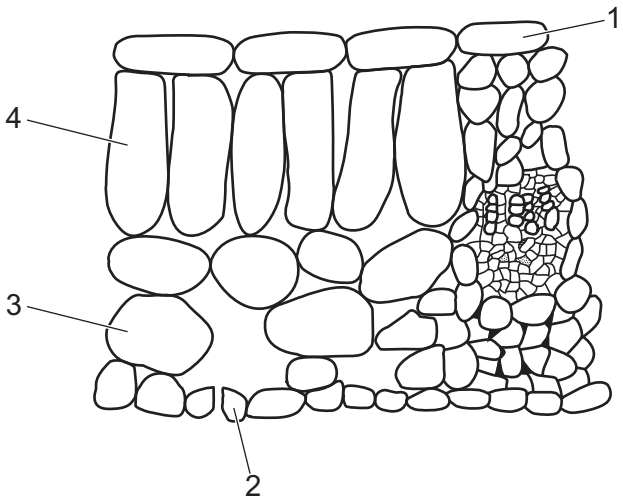
A chlorophyll

B cellulose

C amino acids

D starch

12 The diagram shows a section through a leaf.



Which cells in the diagram contain chloroplasts?

A 1, 2, 3 and 4

B 1 and 2 only

C 2, 3 and 4 only

D 3 and 4 only

13 A student investigates the movement of coloured water up a plant stem. The coloured water moves 12 mm up the stem in five minutes.

What is the rate of movement of the water?

A 12 mm / minute

B 60 mm / minute

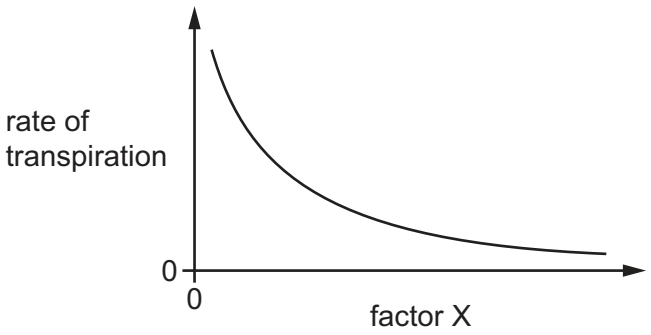
C 60 mm / hour

D 144 mm / hour

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14 The graph shows how the rate of transpiration in a green plant is affected by a factor, X, when all other factors are kept constant.



What is factor X?

A light intensity

B humidity

C temperature

D wind speed

15 Which row does **not** correctly link an enzyme with its substrate and an end-product?

	substrate	enzyme	end-product
A	starch	amylase	maltose
B	lipid	lipase	fatty acids
C	protein	protease	amino acids
D	starch	amylase	glycerol

16 What is the main function of the villi in the ileum?

A to increase the surface area to absorb digested foods

B to move food particles along the ileum

C to produce bile to assist the digestion of lipids

D to remove undigested materials from the ileum

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17 Which equation shows the type of respiration that can cause an 'oxygen debt' in muscles during vigorous exercise?

A glucose + oxygen → carbon dioxide + water

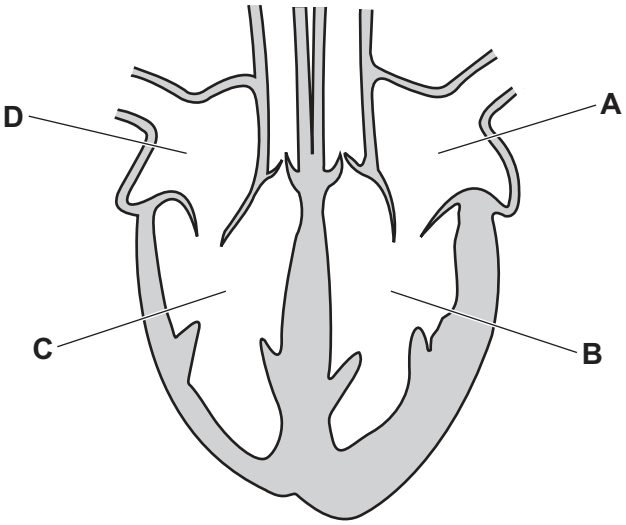
B glucose → lactic acid + carbon dioxide + water

C glucose → ethanol + carbon dioxide

D glucose → lactic acid

18 The diagram shows the structure of a human heart.

Which part of the heart is the first to receive nutrients absorbed from the small intestine?



19 The mean blood pressure is measured in the pulmonary artery, pulmonary vein, aorta and vena cava of a human.

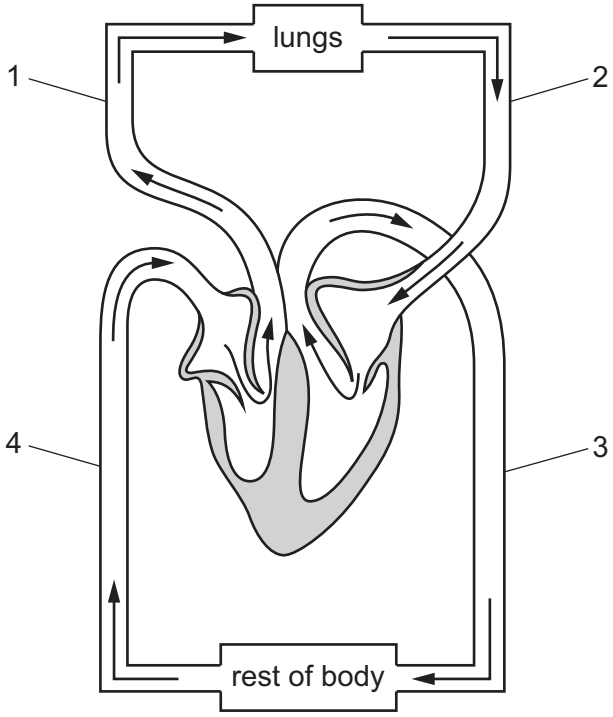
Which blood vessel is most likely to be the pulmonary artery?

	blood pressure mm / Hg
A	3
B	9
C	12
D	120

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20 The diagram shows part of the human circulatory system.



Which vessels contain oxygenated blood?

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

21 Cholera is caused by a toxin produced by a bacterium.

What are the effects of this toxin?

1 Person becomes dehydrated.

2 Ions are secreted into the small intestine.

3 Water moves into the intestine by osmosis.

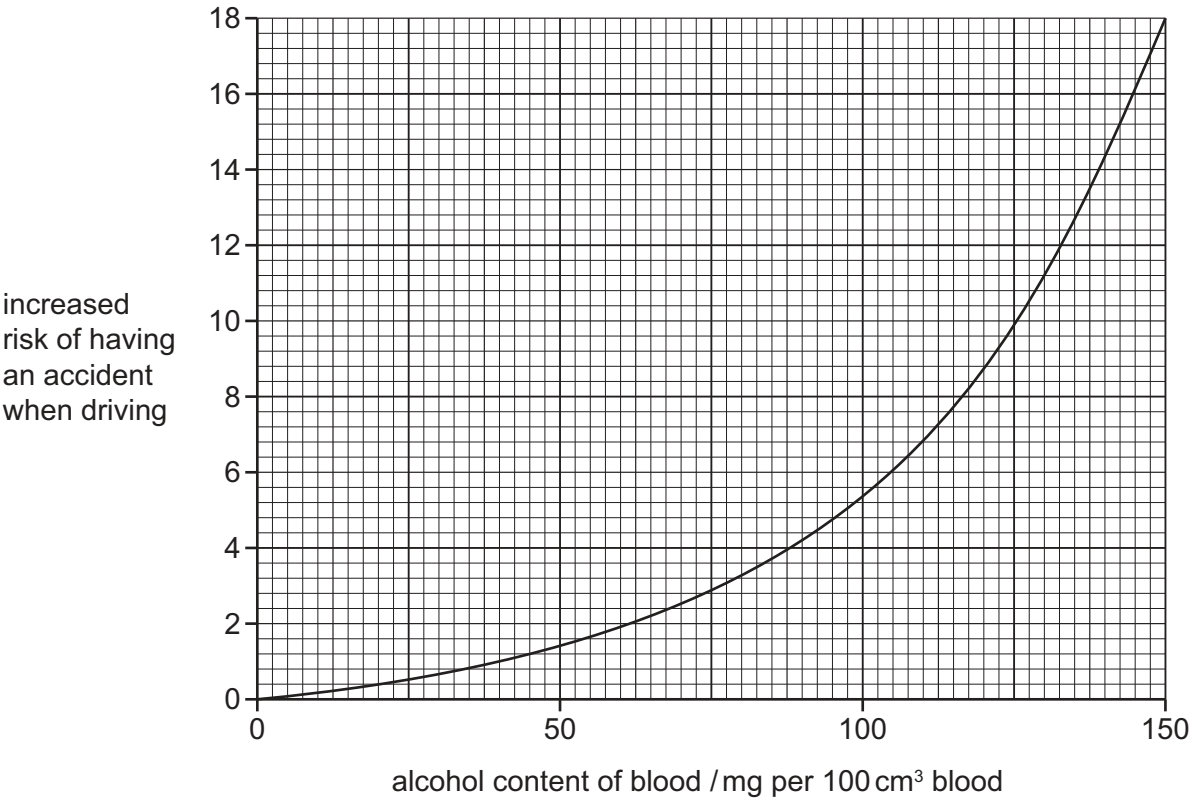
A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

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22 Increased reaction times after consuming alcohol means that people are more at risk of having an accident when driving.

The graph shows how many times more likely it is to have an accident at different blood alcohol concentrations.



In one country, the legal limit for driving is 80 mg of alcohol in 100 cm^3 of blood.

Using the information in the graph, how many times more likely is it to have an accident at the legal limit compared to when no alcohol is consumed?

A 2.6 times

B 2.8 times

C 3.2 times

D 4.0 times

23 Antibiotics taken as tablets can have side effects on the digestive system, including diarrhoea.

Which of these could explain why antibiotics can affect the digestive system?

A They reduce the production of antibodies.

B They kill bacteria needed to keep the gut healthy.

C They kill viruses in the stomach.

D They increase digestion in the small intestine.

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24 Measles is a viral infection that can be prevented by vaccination.

In 1990, there were 801 683 deaths worldwide due to measles.

In 2019, there were 83 392 deaths worldwide due to measles.

To the nearest whole number, what was the percentage decrease in deaths due to measles?

A 9% **B** 10% **C** 90% **D** 861%

25 In humans, which type of immunity may be gained by young babies fed on breast milk?

A artificial

B active

C long-term

D passive

26 The pupil reflex action in the eye is a response to changes in light intensity.

The size of the pupil is altered by the action of the radial and circular muscles in the iris.

Which row describes the pupil reflex action?

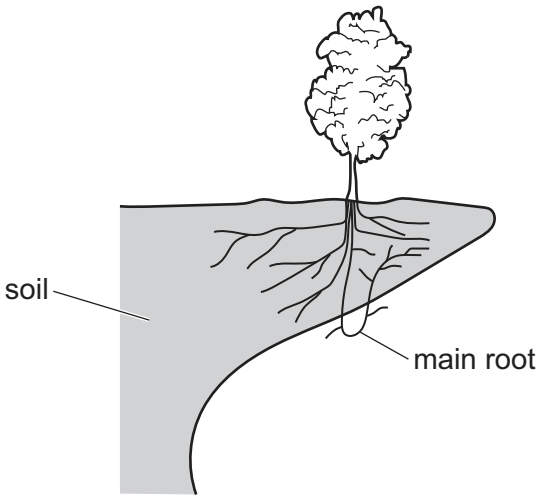
	light intensity	**radial muscles**	**circular muscles**	**pupil**
A	high	relax	contract	gets smaller
B	low	relax	contract	gets bigger
C	high	contract	relax	gets bigger
D	low	contract	relax	gets smaller

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27 A walker was climbing a hill and noticed a small tree that had grown through an overhanging piece of ground.

The diagram shows how the roots of the tree had grown.



Which statement explains the behaviour of the main root?

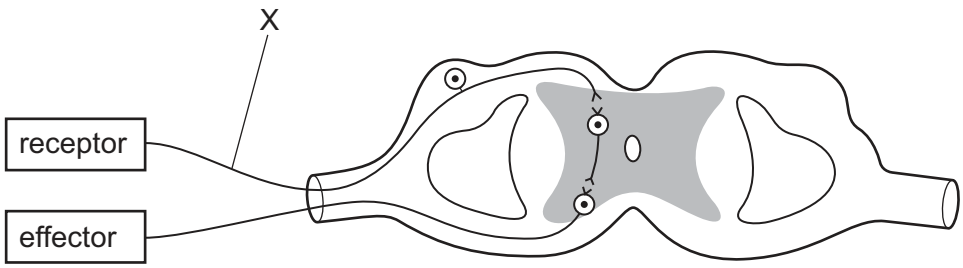
A It is preventing the soil from collapsing.

B It must absorb oxygen for the survival of the tree.

C It receives extra auxin and grows back into the soil.

D It responds negatively to the stimulus of light.

28 The diagram shows the parts of the nervous system involved in a reflex action.



Which part of the nervous system is labelled X?

A motor neurone

B synapse

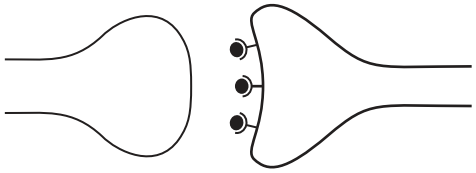
C relay neurone

D sensory neurone

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29 The diagram shows a synapse.



Which stage of synaptic transmission is shown?

A An impulse stimulates the release of neurotransmitter molecules from vesicles into the synaptic gap.

B The neurotransmitter molecules bind with receptor proteins.

C The neurotransmitter molecules diffuse across the synaptic gap.

D Vesicles containing neurotransmitter move towards the presynaptic neurone membrane.

30 The following conversation took place between a doctor (Dr) and a patient (P).

P: My heart seems to be beating faster than usual and I seem to be taking faster and deeper breaths.

Dr: Is this happening just when you are exercising?

P: No. It's happening even when sitting at my desk working.

The doctor concluded that the level of a hormone in the patient's blood might be higher than normal.

Which hormone could this be?

A insulin

B adrenaline

C testosterone

D glucagon

31 When the body temperature of a dog is low, muscles attached to body hairs will contract and cause the body hairs to stand upright.

How does this help to maintain the dog's body temperature?

A The upright body hairs trap air and air provides good insulation.

B The upright body hairs trap air and air provides poor insulation.

C The upright body hairs trap water lost through sweating and water provides good insulation.

D The upright body hairs trap water lost through sweating and water provides poor insulation.

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32 Which two hormones are responsible for the release of an egg from an ovary and the thickening of the uterus lining during the menstrual cycle?

	the release of an egg from an ovary	**thickening of the uterus lining**
A	luteinising hormone	follicle stimulating hormone
B	follicle stimulating hormone	progesterone
C	luteinising hormone	oestrogen
D	luteinising hormone	progesterone

33 What does auxin stimulate?

A cell division

B cell elongation in shoots

C uptake of mineral ions by active transport

D release of an egg cell

34 Some features of cell division are listed.

1 sometimes called reduction division

2 used in asexual reproduction

3 used in the cell division of stem cells

4 results in the production of haploid cells

5 sometimes produces a cancer

Which of these are features of meiosis?

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

35 An amoeba is an organism belonging to the kingdom Protoctist.

Amoebas reproduce asexually and divide approximately every two days.

Starting at day 0 with a single amoeba, how many amoebas will there be at the end of day 14, assuming none have died?

A 28 **B** 64 **C** 128 **D** 256

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36 What is an example of continuous variation?

A ABO blood groups

B body mass

C seed colour in peas

D seed shape in peas

37 A strand of DNA has the code CTCAGCA.

What would be the code for the complementary strand?

A AGACTAC

B CTCAGCA

C GAGTCGT

D TCTGATG

38 What is an aim of conservationists within the fishing industry?

A to eliminate some of the competing species

B to ensure that enough adult fish mature to breed each year

C to reduce the number of protected areas

D to reduce the size of the mesh of nets used for fishing

39 Hardwood trees in tropical rainforests are often harvested for timber. A single quick-growing plant, such as the African oil palm tree, is then grown on the same land.

Which effect will removing the rainforest have on the environment?

A decreased run off into rivers and flooding

B improved soil structure

C reduced soil erosion by wind and rain

D reduced biodiversity of the area

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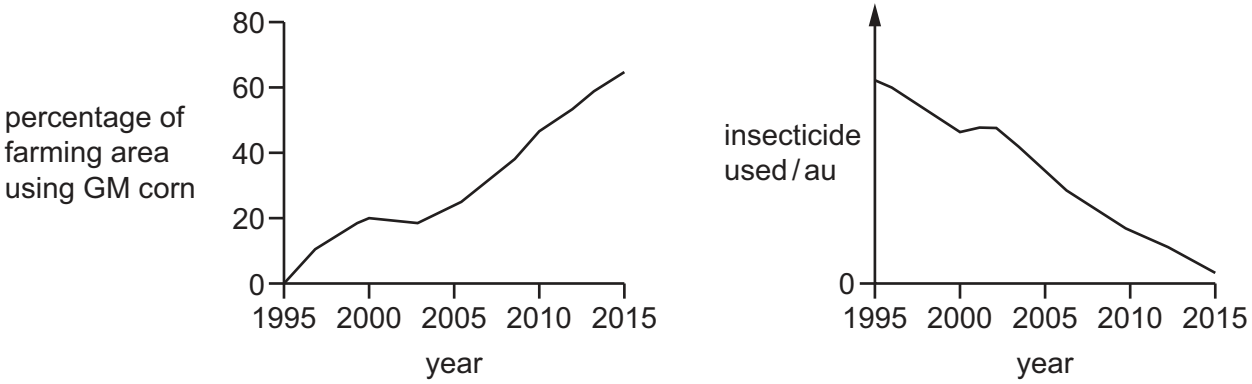
40 Corn (maize) is an important food crop in some countries.

In one country, the corn crop was often attacked by insect pests.

This reduced its yield so farmers sprayed the growing corn with insecticides which caused environmental damage.

Scientists produced genetically modified (GM) corn so that the corn itself produced a toxin which killed the insect pests.

The graphs show the percentage of the farming area in which the GM corn was grown over a number of years and how much insecticide was used during those years.



Which trends are shown in the graphs and information given?

1 When no GM corn was grown, insecticide use was at its highest.

2 As more GM corn was grown, less insecticide was used.

3 As the use of insecticide decreased, it was possible to grow more GM corn.

4 Growing more GM corn decreased the environmental damage caused by insecticides.

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

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