Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

BIOLOGY **5090/12**

Paper 1 Multiple Choice **October/November 2018**

1 hour

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

8931258670

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 A cell is observed under a microscope.

Which feature identifies it as a plant cell?

A The cell contains a single large sap vacuole.

B The cell contains glucose and amino acids.

C The cell contains stored fat.

D The cell surface membrane is partially permeable.

2 Which statements about diffusion are correct?

	molecules move from a higher to a lower concentration	only occurs within living systems	rate slows down as the temperature increases
A	✓	✓	✗
B	✓	✗	✗
C	✗	✓	✓
D	✗	✗	✓

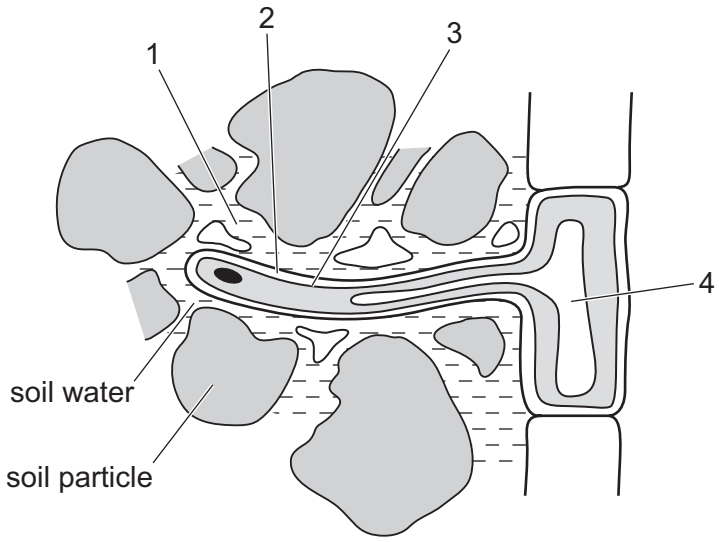
key

✓ = yes

✗ = no

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3 The diagram shows a root hair cell and surrounding soil particles.



Osmosis occurs when regions of higher and lower concentration of water molecules are separated by a partially permeable membrane.

On the diagram, what are these regions?

	higher concentration of water molecules	partially permeable membrane	lower concentration of water molecules
A	1	2	4
B	1	3	4
C	4	2	1
D	4	3	1

4 What are enzymes?

A fats that are secreted by glands in the digestive system

B fats that have a characteristic molecular shape

C proteins that act as biological catalysts

D proteins that are unaffected by temperature

5 Some organisms live at the bottom of the sea where it is very dark. To synthesise glucose, they use energy from chemicals in the very hot water that comes out of volcanoes.

What is a distinguishing feature of these organisms?

A Their enzymes are easily denatured by heat.

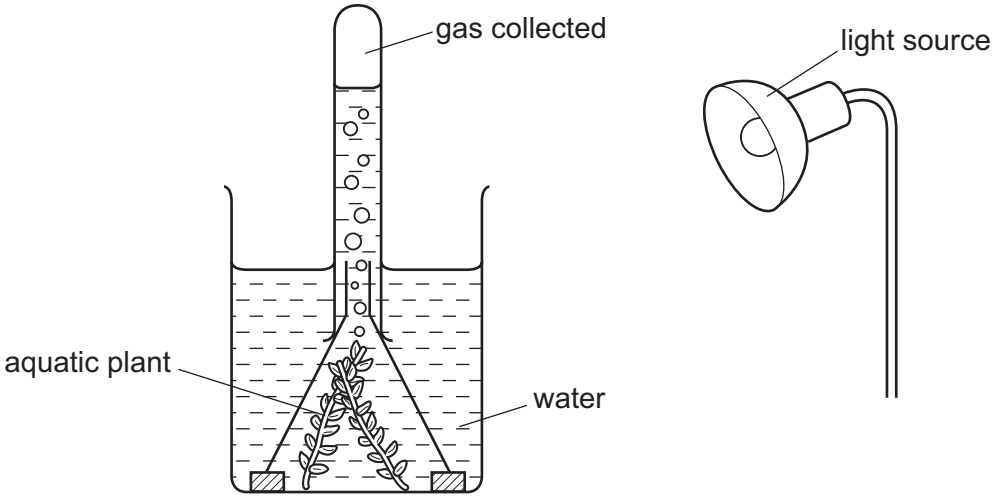
B They do not need carbon dioxide.

C They do not need to be green.

D They obtain energy only as carnivores.

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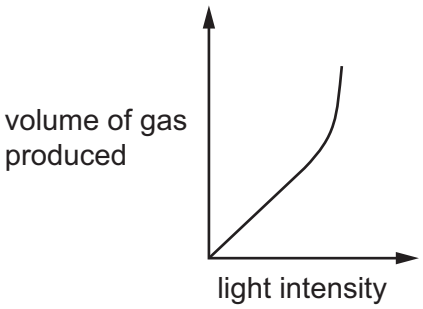
6 An experiment is set up as shown. The volume of gas collected is measured after 30 minutes.



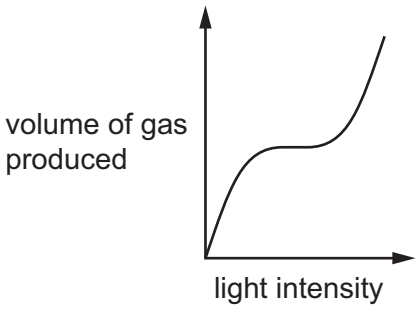
The experiment is repeated several times. Each time the light intensity is increased.

Which graph shows the results?

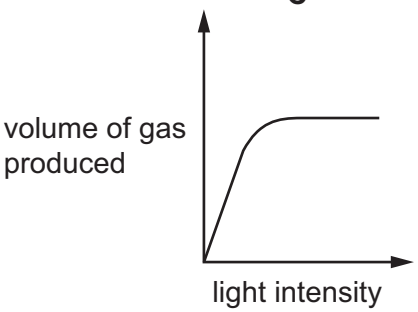
A



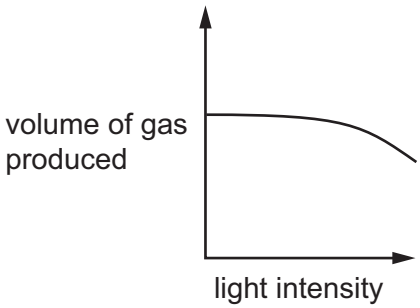
B



C

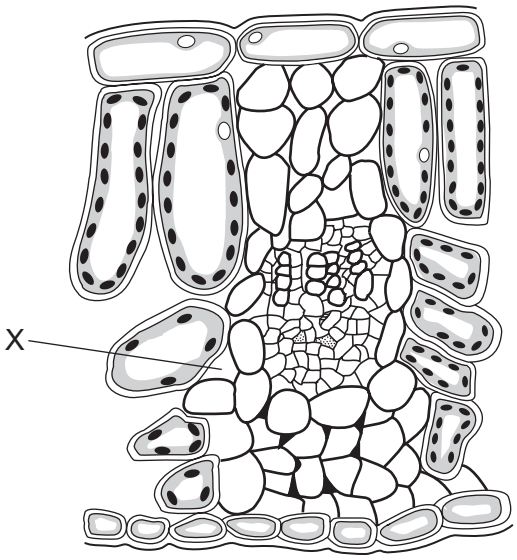


D



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7 The diagram represents a cross-section of part of a leaf.



How does the oxygen content of the air at X compare to normal atmospheric air when the leaf is in the light and when it is in the dark?

	in the light	in the dark
A	higher	lower
B	higher	the same
C	lower	higher
D	lower	the same

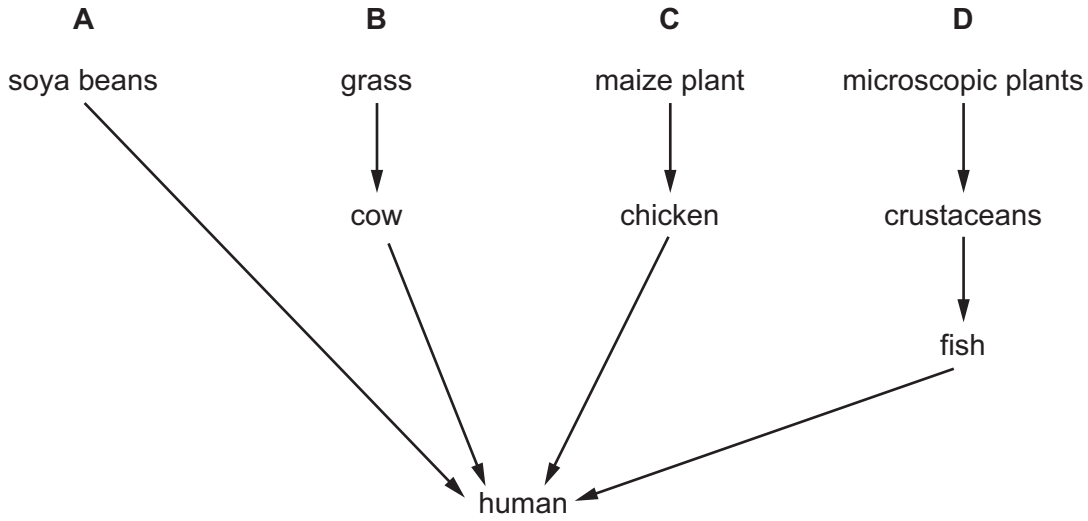
8 What are the smaller basic units that make up glycogen and protein?

	glycogen	protein
A	amino acids	glucose
B	fatty acids	glucose
C	glucose	amino acids
D	glucose	fatty acids

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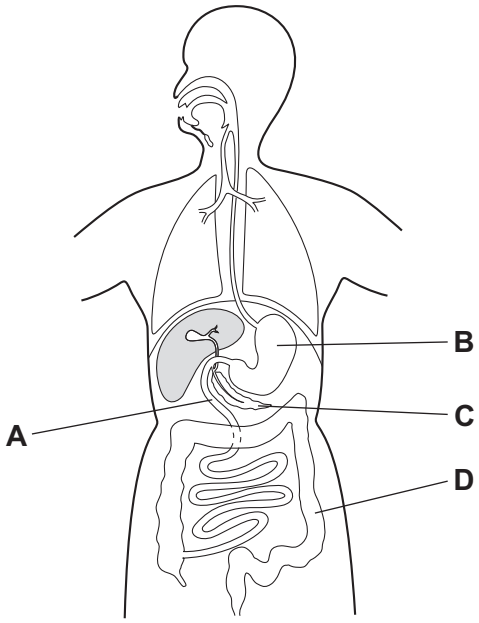
[Turn over

9 Which pathway provides humans with the most fibre (roughage) in the diet?



10 A gland secretes different types of enzymes into part of the alimentary canal which allows digestion of proteins and starch. It also receives alkaline secretions from another gland and contains muscles that are used in peristalsis.

Which part of the alimentary canal is being described?



11 What is **not** a function of transpiration?

A It causes minerals to travel up through the plant.

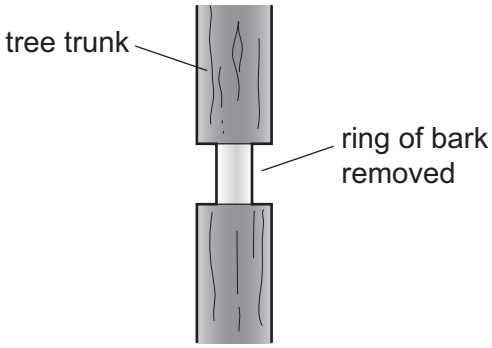
B It causes water to move from the roots to the leaves.

C It helps to keep the plant cool.

D It helps to release energy in cells.

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12 The diagram shows part of a tree trunk. A ring of bark including the phloem has been removed.



The tree will eventually die because removing the bark stops the transport of

A mineral salts to the leaves.

B organic nutrients to the roots.

C oxygen to the roots.

D water to the leaves.

13 Which of these organs will receive blood from both an artery **and** a vein?

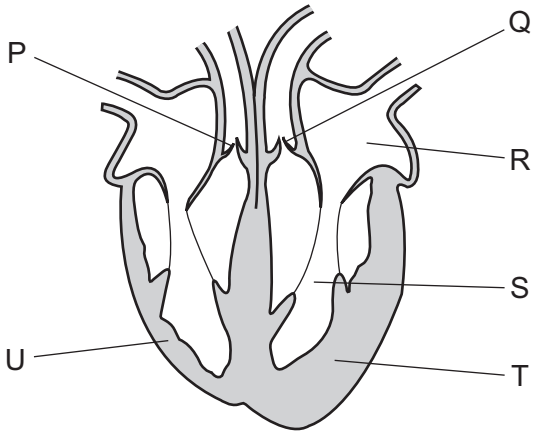
	kidney	liver	lung
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

key

✓ = yes

✗ = no

14 The diagram shows a section through the human heart.



Which suggests that blood leaves the heart at different pressures, when going to the lungs and to the body?

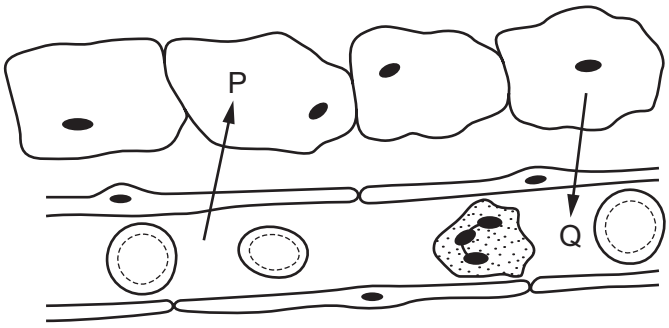
A Chambers R and S have different volumes.

B The walls of the atria are thinner than the walls of the ventricles.

C Valve P is stronger than valve Q.

D Wall T is more muscular than wall U.

15 The diagram shows chemicals being exchanged between some cells and a blood capillary.



What could be the identities of chemicals P and Q?

	P	Q
A	amino acids and oxygen	carbon dioxide and maltose
B	carbon dioxide and glucose	alcohol and oxygen
C	carbon dioxide and urea	oxygen and protein
D	glucose and oxygen	carbon dioxide and water

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16 How many molecules of carbon dioxide will be produced from the breakdown of two molecules of glucose in aerobic respiration?

A 2 **B** 4 **C** 6 **D** 12

17 How does anaerobic respiration in muscle cells cause a reduction in blood pH?

A Carbon dioxide, from anaerobic respiration, dissolves in the blood.

B Ethanol produced from cell respiration diffuses into the blood.

C Lactic acid diffuses into the blood.

D Oxygen is removed from the blood supplying the muscle cells.

18 Which row shows the events that occur to cause air to flow into the lungs?

	shape of the diaphragm	movement of the rib cage
A	dome-shaped	down and inwards
B	dome-shaped	up and outwards
C	flattened	down and inwards
D	flattened	up and outwards

19 Why is it important that the lungs remove carbon dioxide from the body?

A Carbon dioxide is a greenhouse gas.

B Carbon dioxide is a metabolic waste product and is poisonous.

C Carbon dioxide would increase the pH of the blood.

D Carbon dioxide is needed by plants for photosynthesis.

20 Which structures are **all** involved in controlling human body temperature?

A blood vessels near the skin surface, the cerebellum and sweat glands

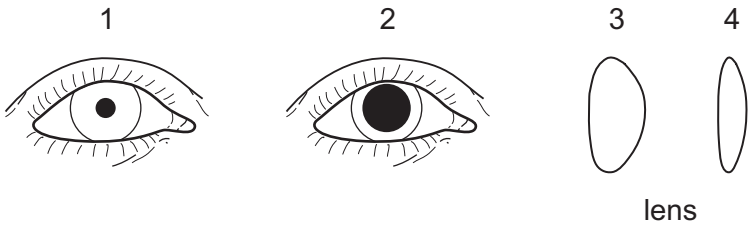
B blood vessels near the skin surface, the hypothalamus and skeletal muscles

C kidneys, the cerebellum and sweat glands

D kidneys, the hypothalamus and skeletal muscles

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21 The diagrams show the eye viewed from the front and its lens in cross-section.



Which diagrams show the appearance of the pupil and the shape of the lens when looking up at the sky at night?

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

22 What is a major function of the medulla in the brain?

A balance and coordination

B controlling contractions of the diaphragm

C reasoning and thinking

D secretion of hormones

23 Which statement about insulin is correct?

A It converts glycogen to glucose.

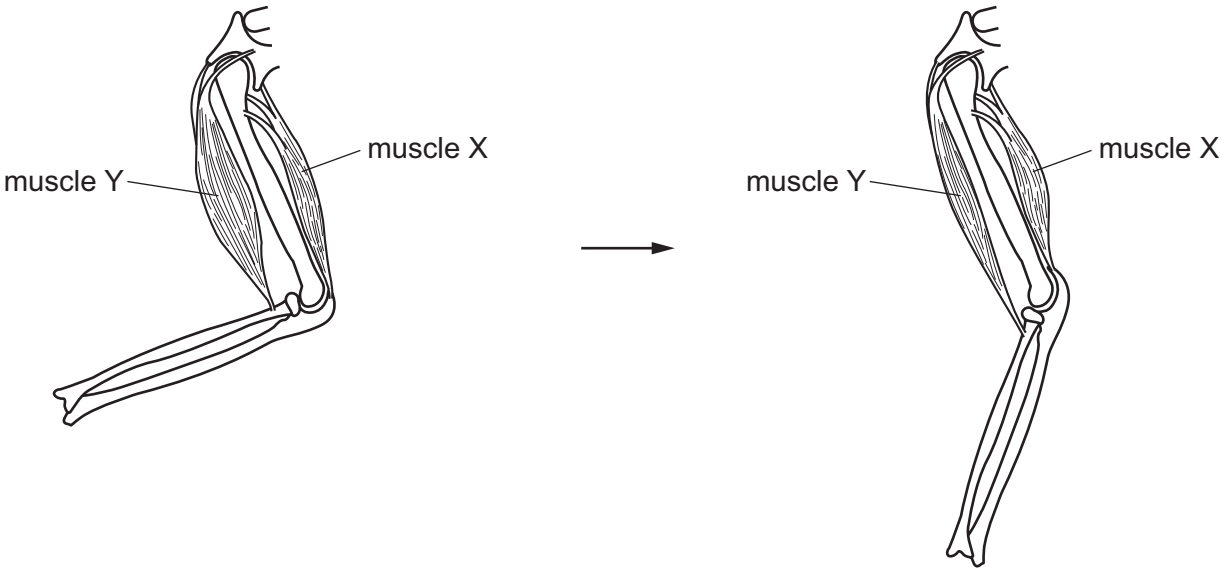
B It is broken down by the liver.

C It is secreted by the liver.

D Its release increases blood glucose levels.

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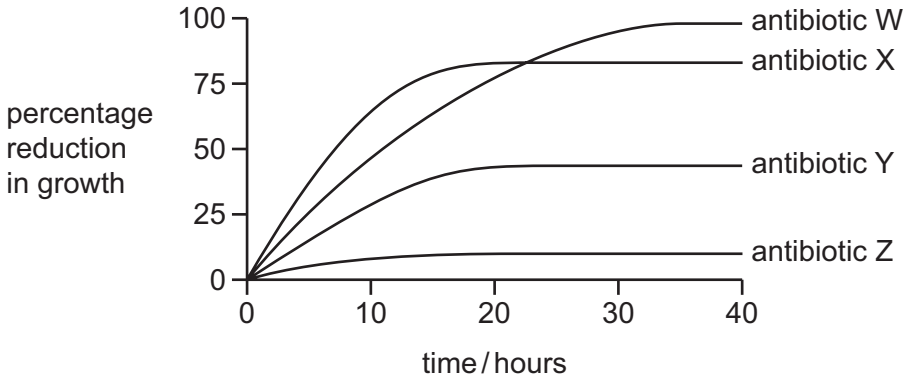
24 The diagram shows the elbow joint in two different positions.



What happens to the muscles to change the position of the elbow joint as shown above?

	muscle Y	muscle X
A	contracts	contracts
B	contracts	relaxes
C	relaxes	contracts
D	relaxes	relaxes

25 The graph shows the effect of four different antibiotics on the growth of a population of bacteria.



Which of these statements is correct?

1 Antibiotic W is more effective than antibiotic X against these bacteria after 10 hours.

2 Antibiotic X is more effective than antibiotic Y against these bacteria.

3 Antibiotic Z is the most effective of these four antibiotics against these bacteria.

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

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26 Yeast is used in the production of which materials?

	alcohol	bread	cheese	yoghurt
A	✓	✓	✗	✗
B	✓	✗	✗	✗
C	✗	✓	✓	✗
D	✗	✗	✓	✓

key
✓ = yes
✗ = no

27 Some stages in the production of yoghurt are listed.

1 liquid cooled rapidly

2 liquid kept at 40 – 45 °C for 3 hours

3 culture of bacteria added to liquid

4 liquid pasteurised

In which order do these stages occur?

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

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

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

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

28 Which organisms **always** obtain their energy from dead organic matter?

A consumers

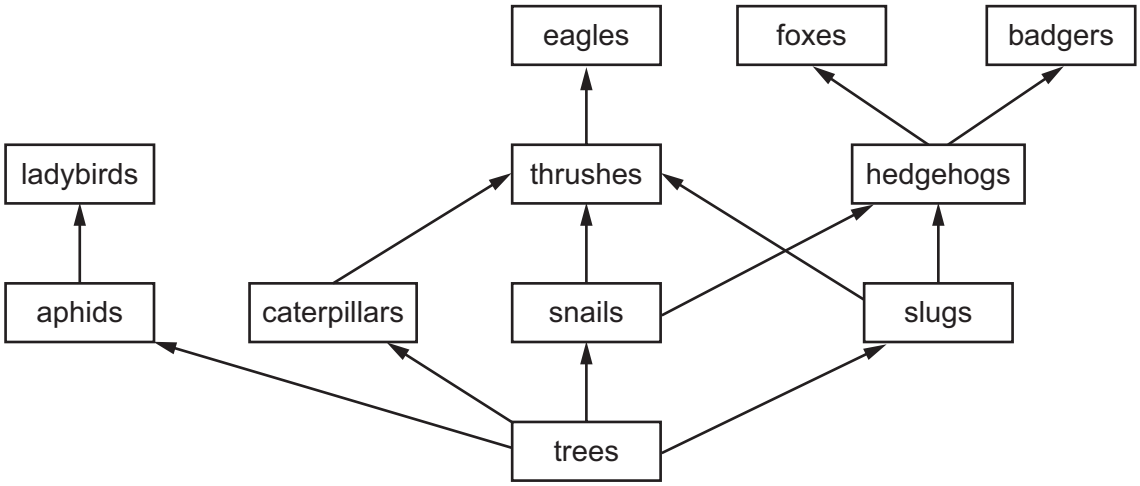
B decomposers

C fungi

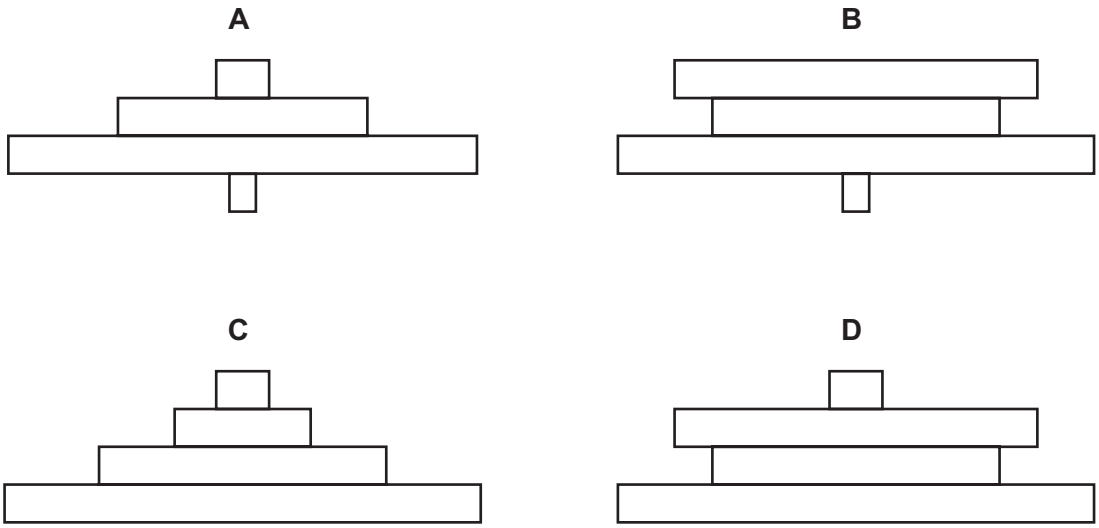
D producers

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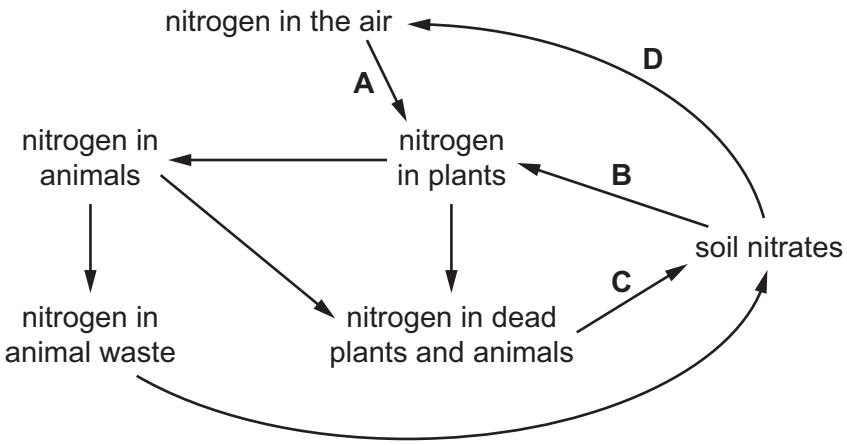
29 The diagram shows part of a food web.



Which pyramid of numbers is based on this food web?



30 Which labelled arrow in the nitrogen cycle represents nitrogen fixation?



31 Which type of organism is the vector of the parasite that causes malaria?

A bacterium

B fungus

C insect

D virus

32 Why are insecticides sometimes regarded as pollutants?

A They can increase the number of bacteria in ponds and rivers.

B They can increase the rate of growth of water plants.

C They can kill a wide range of insects.

D They can kill the plants that they are designed to protect.

33 What is an advantage of sexual reproduction over asexual reproduction?

A It allows growth of the species.

B It produces offspring more quickly.

C It produces offspring with different characteristics.

D It protects the embryo during its early growth.

34 What are two male parts of a flower?

A anther and carpel

B anther and filament

C carpel and filament

D stamen and style

35 Which row shows a disease and the pathogen that causes it?

	disease	pathogen that causes it
A	AIDS	bacterium
B	AIDS	insect
C	malaria	insect
D	syphilis	bacterium

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36 The table gives the average dietary requirements of iron in mg per day for females and males of various ages.

age / years	females	males
1	7	7
10	11	10
20	15	10
60	10	10

Why does a 20 year-old female require the highest average dietary requirement of iron?

A to act as a store for pregnancy

B to make up for menstrual blood loss

C to promote protein synthesis

D to provide for milk production

37 What is the primary function of DNA?

A It controls the absorption of nutrients.

B It controls the production of protein.

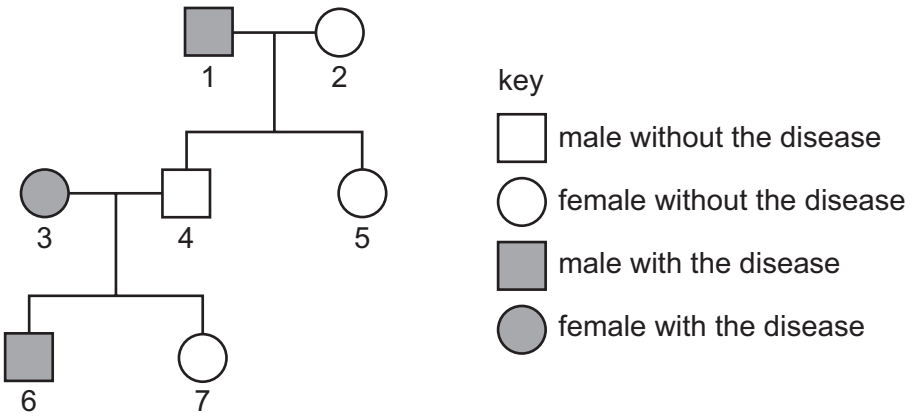
C It controls the rate of mutation.

D It controls the rate of reproduction.

38 In the ABO blood group system, which genotype is homozygous dominant?

A $I^A\ I^O$ **B** $I^A\ I^B$ **C** $I^B\ I^B$ **D** $I^O\ I^O$

39 The diagram shows a family in which some members suffer from a disease caused by a recessive allele.



Which are two members of the family who **must** be heterozygous for the gene?

A 5 and 7 **B** 3 and 6 **C** 2 and 5 **D** 1 and 4

40 Which statement is correct?

A Evolution is natural selection.

B Evolution results in natural selection.

C Natural selection and evolution are independent of each other.

D Natural selection results in evolution.

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