Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/21**

Paper 2 Multiple Choice (Extended) **May/June 2016**

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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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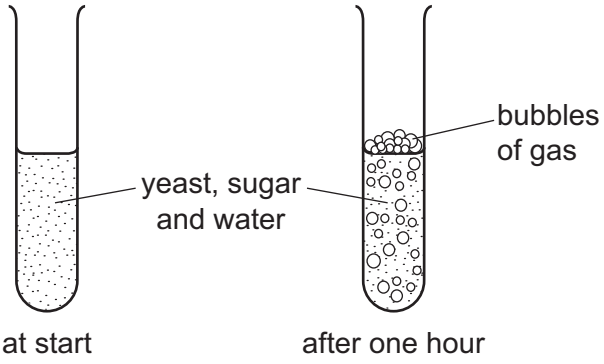
CAMBRIDGE International Examinations

1 Some yeast, sugar and water are mixed in a test-tube. The diagrams show the test-tube at the start and after one hour.

View solution



Which process causes this change?

A growth

B reproduction

C respiration

D sensitivity

2 Which name is given to a group of individuals that can reproduce to produce fertile offspring?

View solution

A a genus

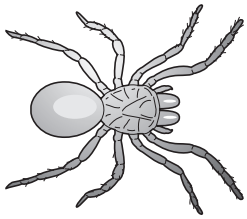
B a kingdom

C a species

D an organ system

3 Use the key to identify the animal shown in the diagram.

View solution



has jointed legs

three pairs of legs

more than three pairs of legs

has tail

no tail

four pairs of legs

more than four pairs of legs

A *Hexagenia*

B *Dytiscus*

C *Argyroneta*

D *Asellus*

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4 Which organelles are present in large numbers in cells that produce insulin?

View solution

A nuclei and mitochondria

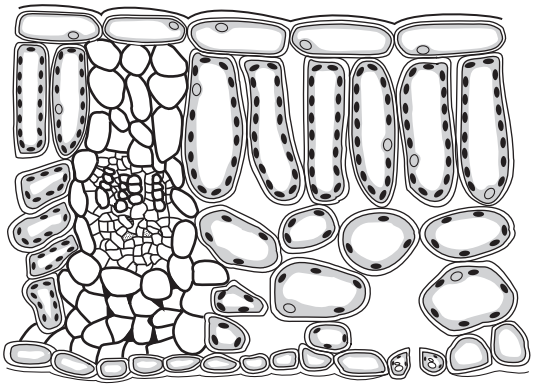
B ribosomes and mitochondria

C rough endoplasmic reticulum and cell walls

D vesicles and nuclei

5 The actual thickness of the leaf shown in the diagram is 2000 μm, but its thickness in the diagram is 50 mm.

View solution



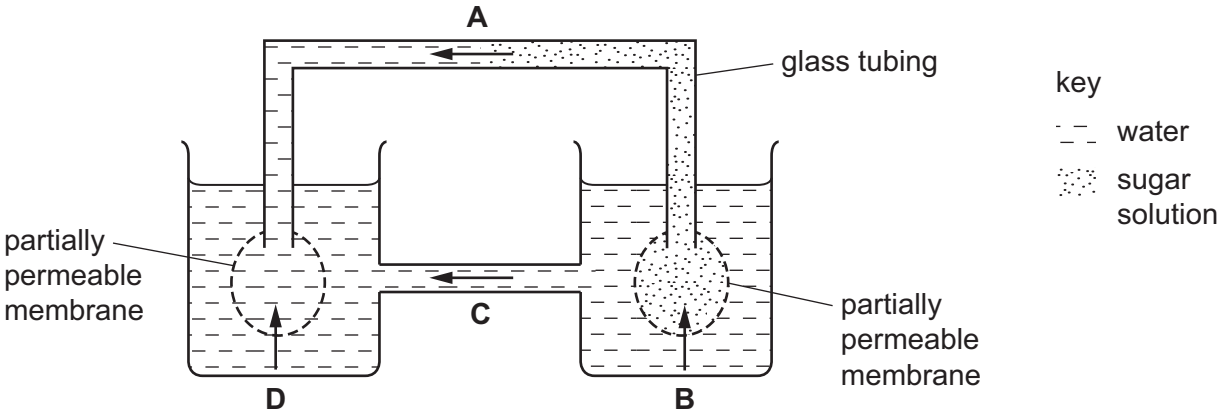
What is the magnification of the diagram?

A ×0.025 **B** ×25 **C** ×100 **D** ×100 000

6 The diagram shows an experiment on osmosis.

View solution

Which arrow shows the direction of the net movement of water at the start of the experiment?



7 Active transport is the movement of

A molecules from a region of their higher concentration to a region of their lower concentration.

B particles from a region of lower concentration to a region of higher concentration using energy from respiration.

View solution

C urine by relaxation of a sphincter muscle in the bladder.

D water through a partially permeable membrane from a more dilute to a more concentrated solution.

8 When bases pair up in the formation of DNA, what is one of the pairings?

View solution

A G with A **B** G with C **C** G with G **D** G with T

9 Small molecules are used as the basic units in the synthesis of large food molecules.

View solution

Which statement is correct?

A Amino acids are basic units of carbohydrates.

B Fatty acids are basic units of glycogen.

C Glycerol is a basic unit of oils.

D Simple sugar is a basic unit of protein.

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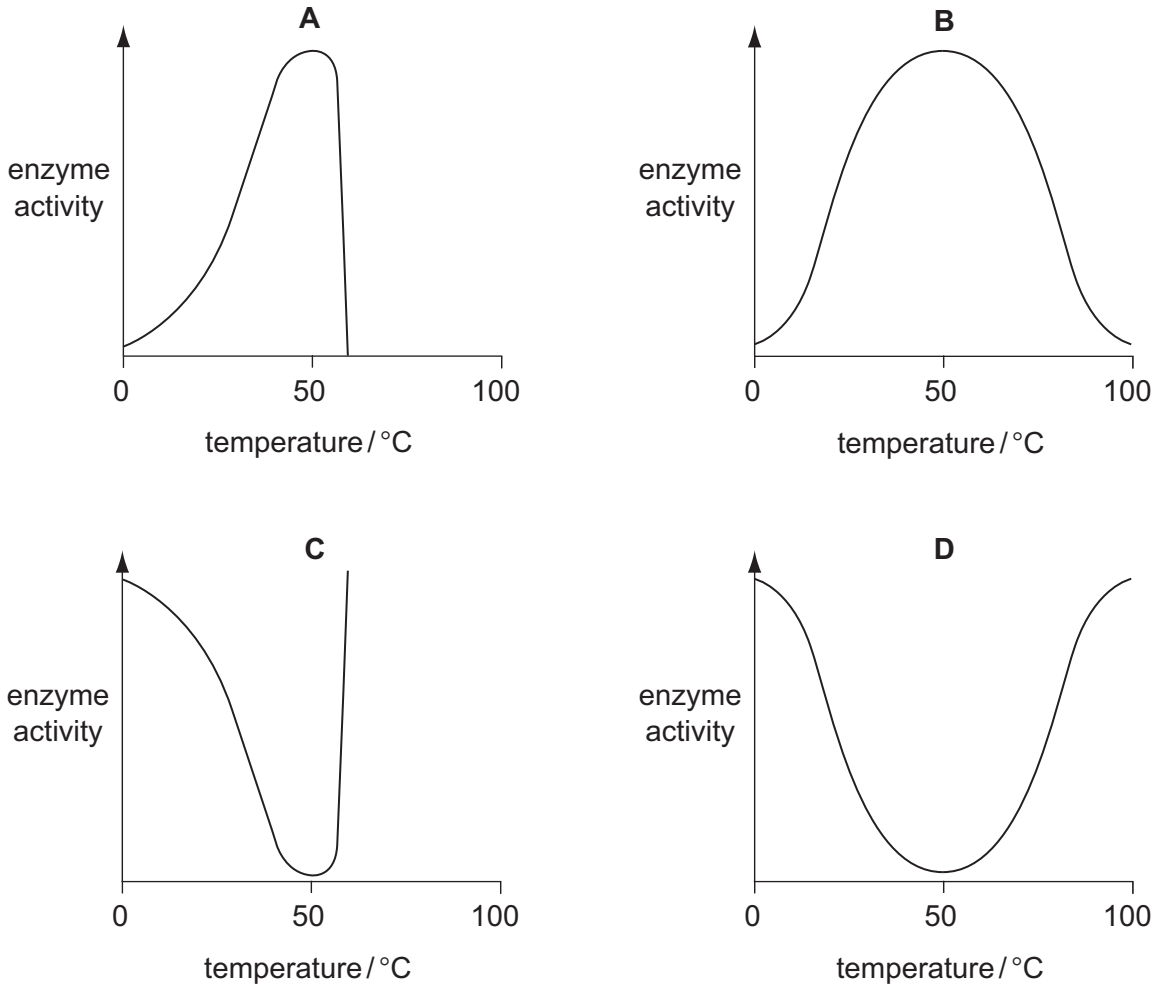
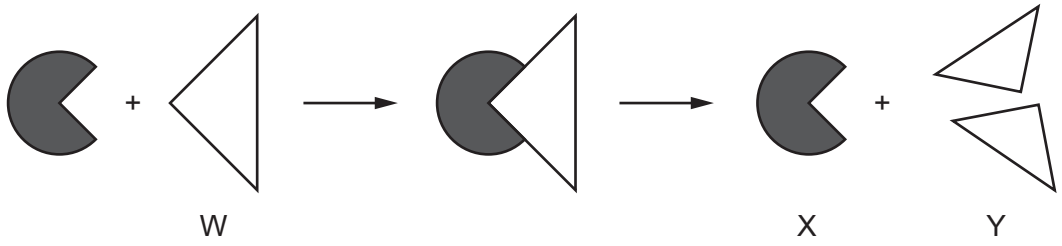
10 Which graph shows the effect of temperature on the activity of an enzyme?

View solution



11 The diagram represents enzyme action.

View solution

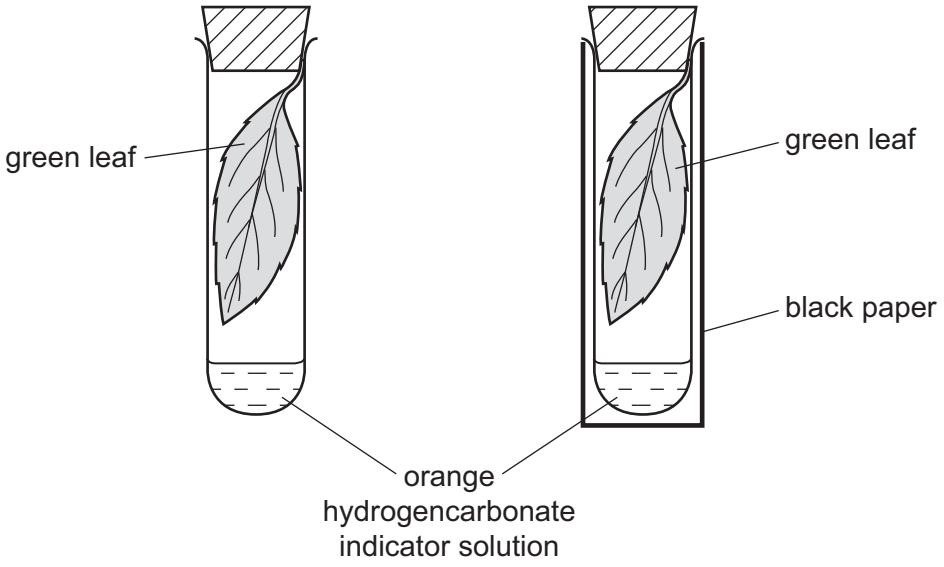


What are parts W, X and Y in this chemical reaction?

	enzyme	product	substrate
A	W	X	Y
B	X	W	Y
C	X	Y	W
D	Y	W	X

12 Two similar leaves are set up in test-tubes as shown. One is exposed to light, while the other is kept in the dark.

View solution



After a few hours, which colour would the hydrogencarbonate indicator solution be in each tube?

	light	dark
A	colourless	blue-black
B	purple	yellow
C	red	blue
D	yellow	purple

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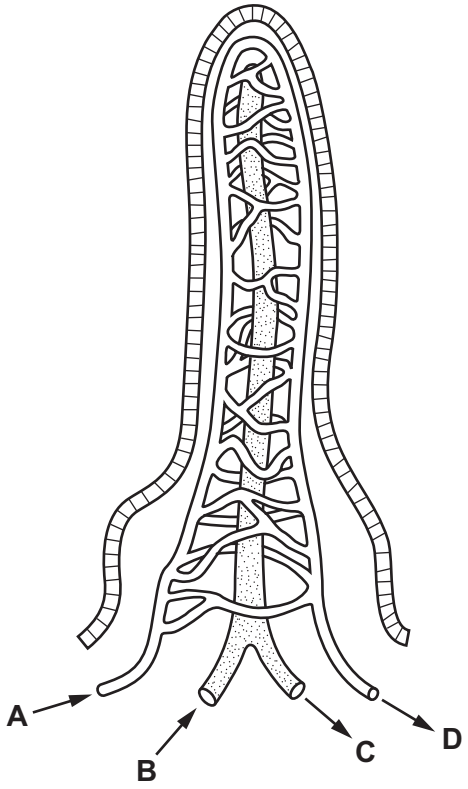
13 The diagram shows a villus. The arrows show the direction of flow within vessels associated with the villus.

View solution

Which vessel carries blood to the liver?



14 What is **not** a result of cholera infection?

View solution

A intestinal blockage

B loss of salts from blood

C severe dehydration of body tissues

D severe diarrhoea

15 What is the function of bile?

View solution

A to acidify food entering the duodenum

B to emulsify starch

C to increase the surface area of fats for digestion

D to provide enzymes for fat digestion

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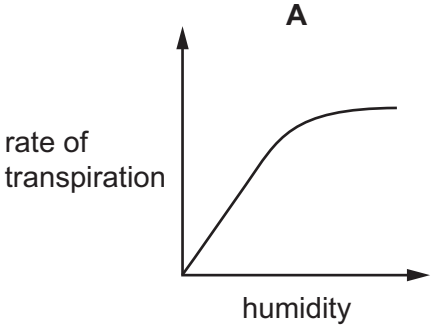
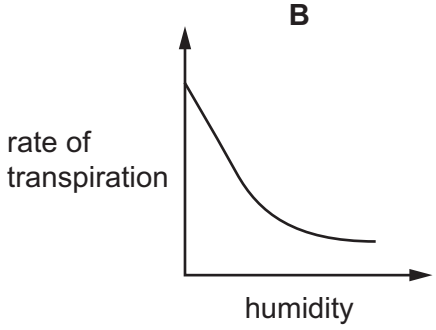
16 Which graph shows most clearly what will happen to the rate of transpiration as humidity increases?

View solution

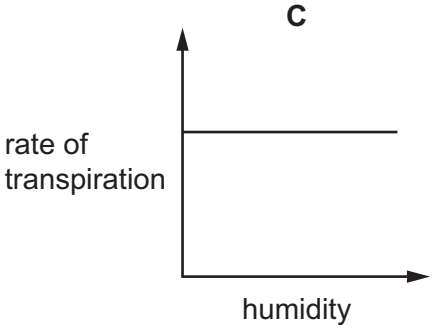
A



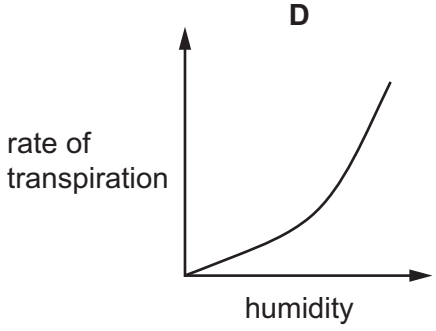
B



C

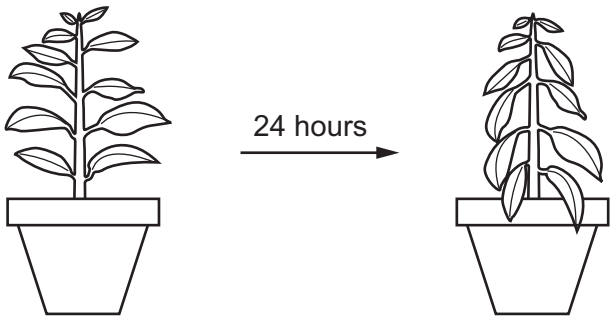


D



17 The diagram shows a potted plant and the same plant 24 hours later.

View solution



What causes the change in the appearance of the plant?

A Water loss is greater than water uptake.

B Water moves from the leaves to the stem.

C Water uptake is equal to water loss.

D Water uptake is greater than water loss.

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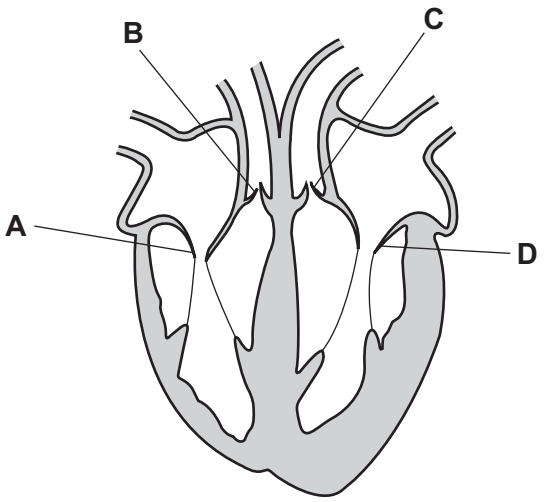
18 The diagram shows a section through the human heart.

View solution

Which is the right atrioventricular valve?



19 What is the function of lymphocytes in the blood?

View solution

A antibody production

B blood clotting

C phagocytosis

D transport of hormones

20 Which part of a pathogen is recognised by the immune system?

View solution

A active site

B antibiotic

C antibody

D antigen

21 Compared with atmospheric air, air breathed out by a human contains

View solution

A less water vapour, less carbon dioxide.

B less water vapour, more carbon dioxide.

C more water vapour, less carbon dioxide.

D more water vapour, more carbon dioxide.

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22 What describes the actions of the intercostal muscles and the diaphragm when we breathe out?

View solution

	external intercostal muscles	internal intercostal muscles	diaphragm
A	contract	relax	falls
B	contract	relax	rises
C	relax	contract	falls
D	relax	contract	rises

23 What is the word equation for aerobic respiration in plants?

View solution

A carbon dioxide + water → glucose + oxygen

B glucose + carbon dioxide → water + oxygen

C glucose + oxygen → carbon dioxide + water

D glucose + water → carbon dioxide + oxygen

24 An amino acid is deaminated. This is the removal of

View solution

A the carbon-containing part.

B the nitrogen-containing part.

C the oxygen-containing part.

D the sulfur-containing part.

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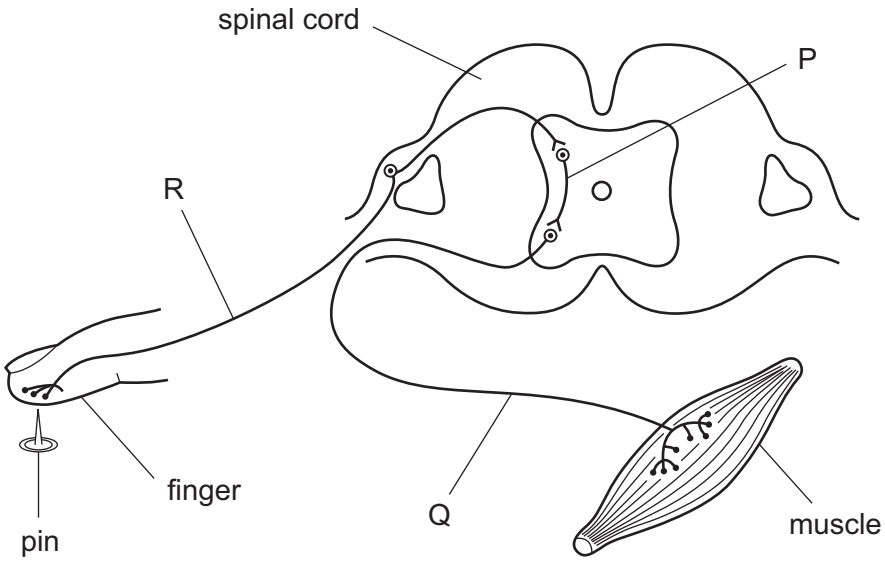
25 The diagram represents a simple reflex arc.

View solution



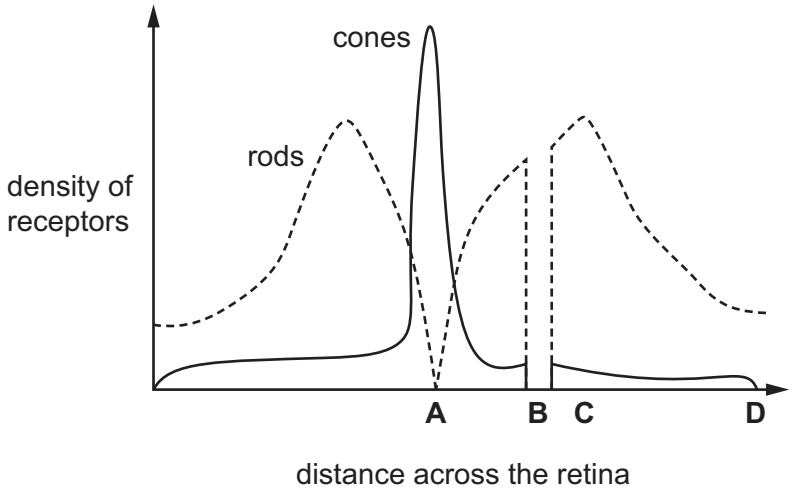
What is the sequence of nerve cells through which an impulse passes during a reflex action?

	first →		last
A	P	Q	R
B	Q	R	P
C	Q	P	R
D	R	P	Q

26 The diagram shows the density of rods and cones across a horizontal section of the retina.

View solution

What is the position of the optic nerve?



27 What are the effects of insulin and glucagon on the concentration of blood glucose?

View solution

	effect of insulin on blood glucose concentration	effect of glucagon on blood glucose concentration
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

28 Which organ is most often damaged by regularly drinking too much alcohol?

View solution

A heart

B liver

C pancreas

D stomach

29 What are advantages of sexual and asexual reproduction?

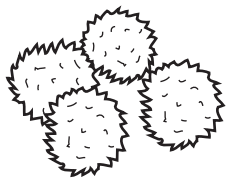
View solution

	advantage of sexual reproduction	advantage of asexual reproduction
A	less population growth	only one parent required
B	more energy efficient	gametes can be transferred by environment
C	more genetic variation	faster
D	no transfer of gametes needed	does not compete with the parent for nutrients

30 The diagrams show pollen grains from three different species of plant as they appear under the microscope. The diagrams are all to the same scale.

View solution

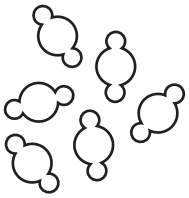
1



2



3



Which pollen grains are involved in insect-pollination?

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

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31 What happens to the chromosome number after meiosis and after mitosis?

View solution

	meiosis	mitosis
A	halved	halved
B	halved	stays the same
C	stays the same	halved
D	stays the same	stays the same

32 In the inheritance of ABO blood groups, when two parents have the genotypes I^AI^A and I^AI^o, what is the blood group of their offspring?

View solution

A group A

B group AB

C group B

D group O

33 Which structures are present in a bacterial cell?

View solution

	cell wall	nucleus
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

34 The whole of an island's population of short-haired bumblebees is descended from just two parents. These were introduced from the mainland.

Which statement about the island's short-haired bumblebee population, compared with that of the mainland, is correct?

View solution

A The population is less in danger of collapsing from disease.

B The population is more able to adapt to environmental changes.

C The population shows more genetic variety.

D The population will adapt to environmental changes more slowly.

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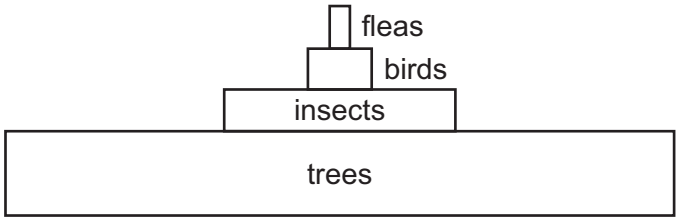
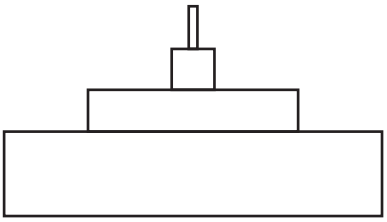
35 The diagram shows a pyramid of biomass for a food chain in a woodland ecosystem.

View solution

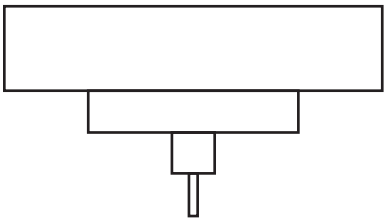


What is the pyramid of numbers for this food chain?

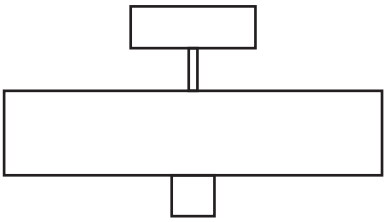
A



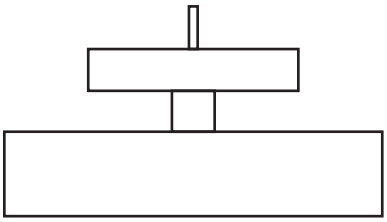
B



C



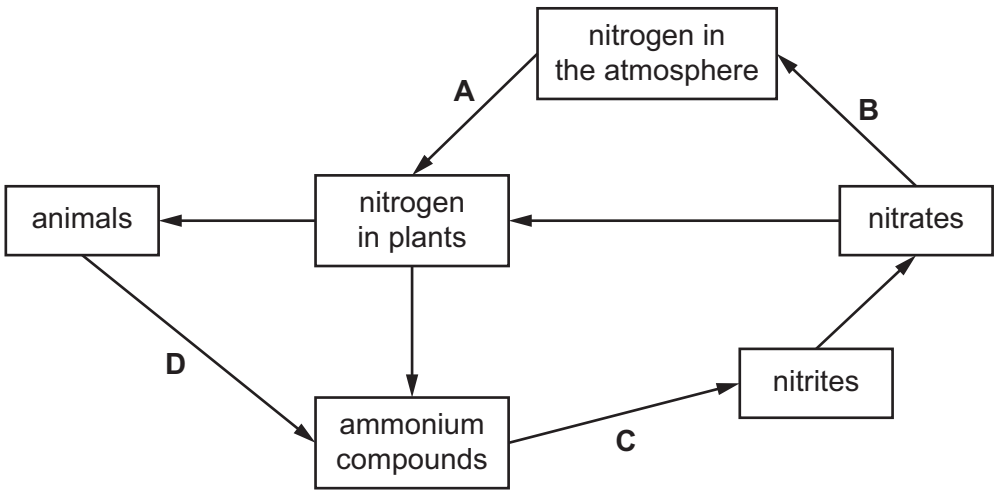
D



36 The diagram shows part of the nitrogen cycle.

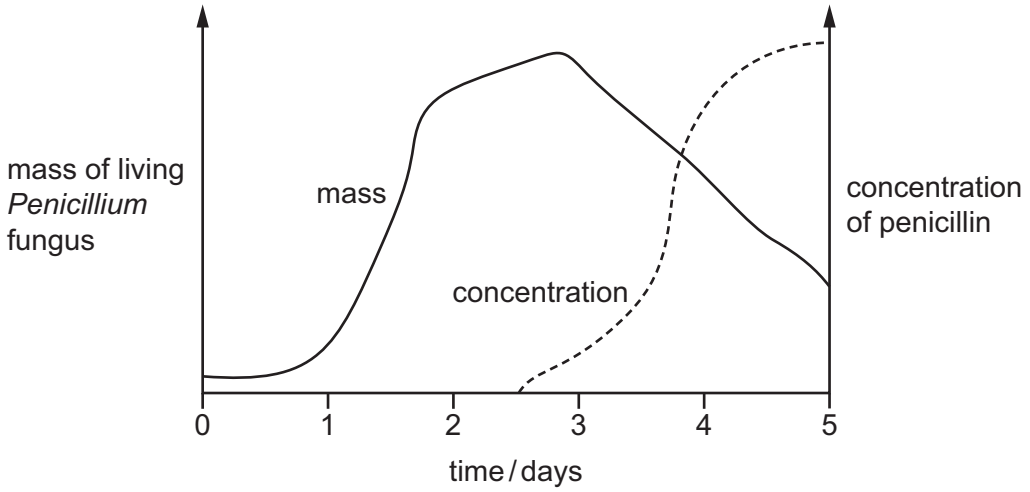
View solution

At which stage is denitrification occurring?



37 Penicillin is produced in a fermenter by growing the fungus *Penicillium*. The graph shows how the mass of living *Penicillium* fungus and the concentration of penicillin changed over time.

View solution



When is the best time to collect the penicillin?

A at 1.5 days

B at 3 days

C at 3.5 days

D at 5 days

View solution

38 A gene for insulin is taken from a human cell and placed in a bacterium.

The bacterium can then make human insulin.

What is this process called?

A artificial selection

B genetic engineering

C heterozygous inheritance

D natural selection

View solution

39 Which effect is **least** likely to occur as a result of deforestation?

A an increase in biodiversity

B an increase in soil erosion

C an increase in the level of carbon dioxide in the atmosphere

D an increased risk of flooding

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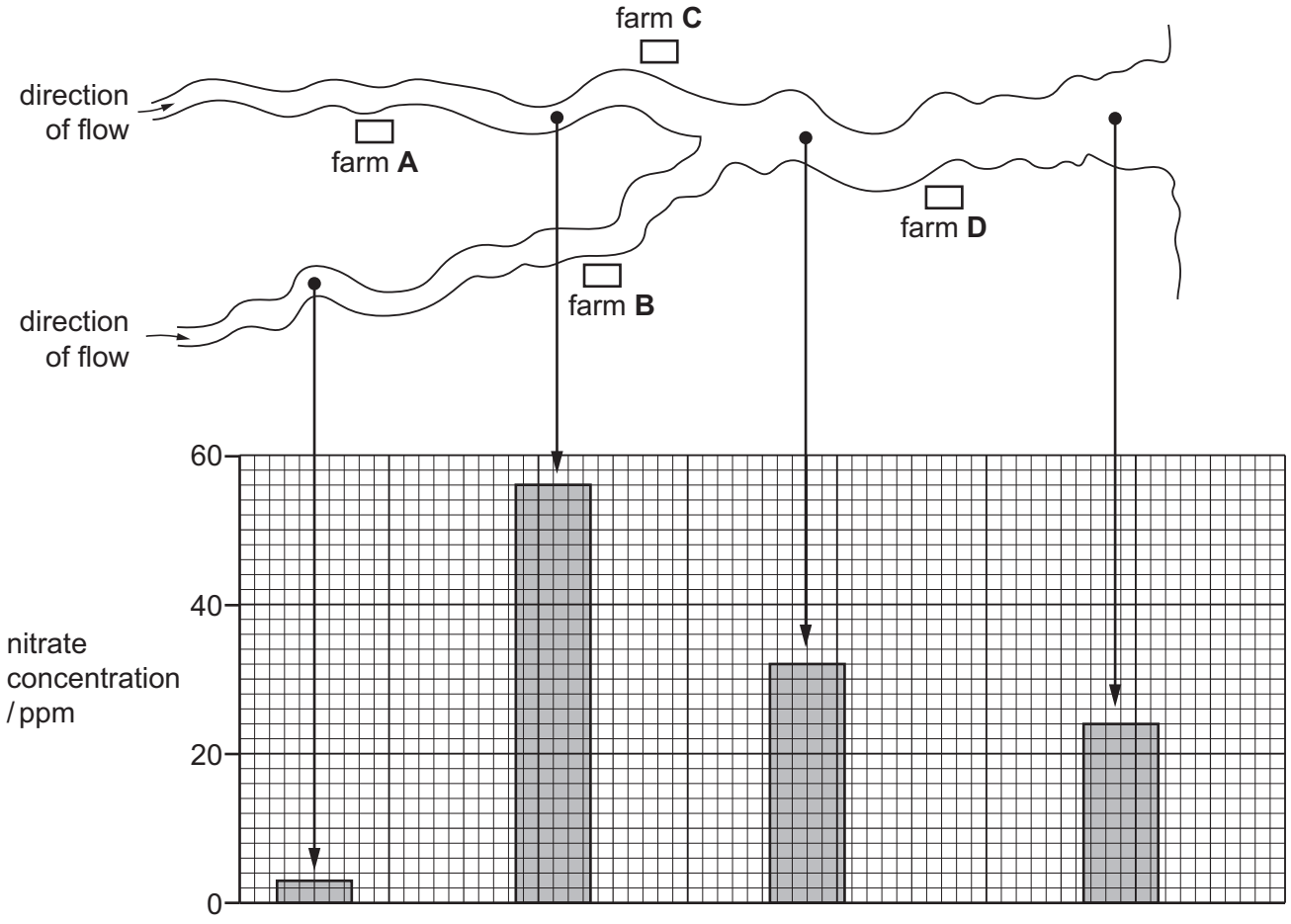
40 The diagram shows the positions of four farms and the concentrations of nitrate at different points in a river.

View solution

Which farm is likely to have been using too much fertiliser on its land?



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