Cambridge O Level

BIOLOGY

5090/12

Paper 1 Multiple Choice

February/March 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)

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.
- Do not write on any bar codes.
- You may use a calculator.

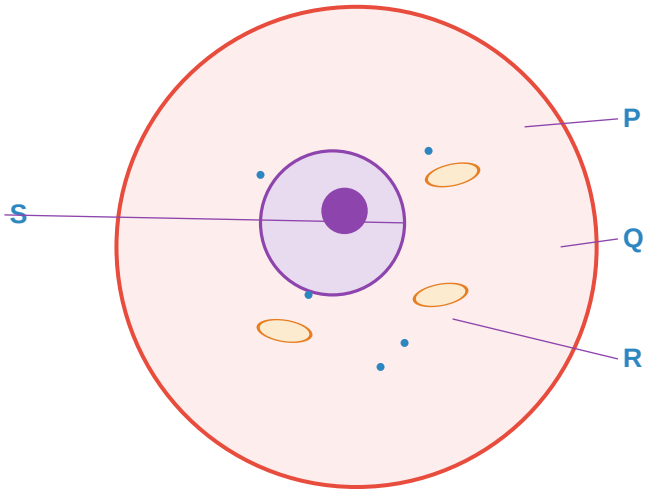
INFORMATION

- 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 multiple pages. Any blank pages are indicated.

1 The diagram shows an animal cell.

Which structure controls the activities of the cell?



A P
B Q
C R
D S

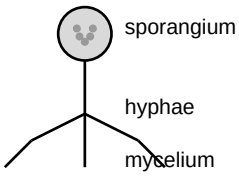
2 Which structure is found in plant cells but not in animal cells?

structure	plant cell	animal cell
cell membrane	present	present
chloroplast	present	absent
cell wall	present	absent
mitochondrion	present	present

A cell membrane
B chloroplast
C mitochondrion
D ribosome

3 The diagram shows an organism viewed under a microscope.

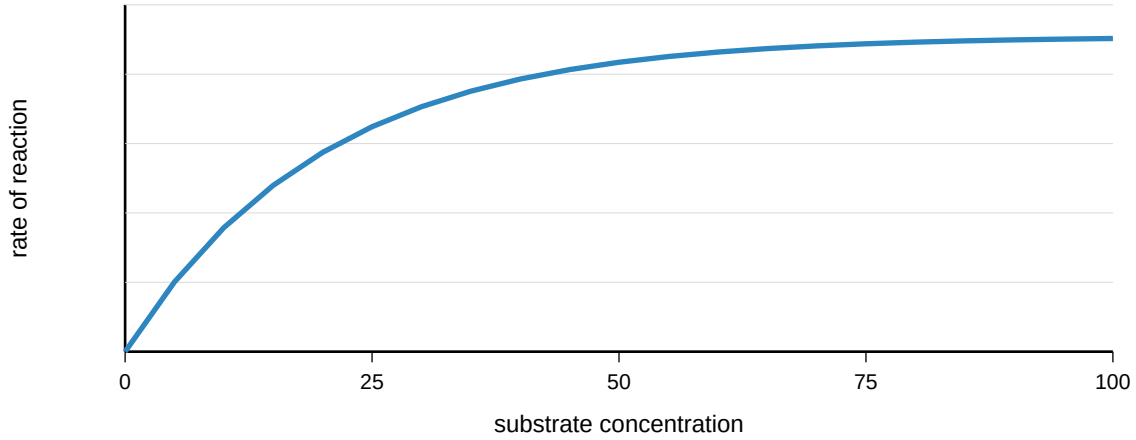
To which group does this organism belong?



A bacteria
B fungi
C plants
D protoctists

4 The graph shows the effect of substrate concentration on the rate of an enzyme-controlled reaction.

What happens to the rate of reaction at high substrate concentrations?



A It continues to increase at the same rate.

B It decreases rapidly.

C It levels off and remains constant.

D It increases then decreases.

5 The table shows the results of an experiment on the effect of light intensity on the rate of photosynthesis.

What is the relationship between light intensity and the rate of photosynthesis?

light intensity / arbitrary units	rate of photosynthesis / bubbles per minute
1	5
2	10
3	14
4	16
5	17
6	17

A As light intensity increases, the rate always increases.

B As light intensity increases, the rate increases then levels off.

C As light intensity increases, the rate decreases.

D Light intensity has no effect on the rate.

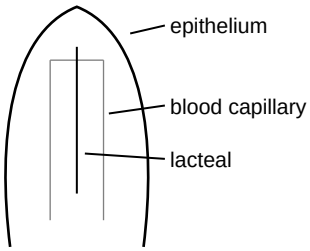
6 The table shows the main functions of different parts of the alimentary canal.

Which part is the main site of absorption of digested food?

	part	main function
A	large intestine	absorbs water
B	oesophagus	moves food to stomach
C	small intestine	absorbs digested food
D	stomach	digests protein

7 The diagram shows a villus from the small intestine.

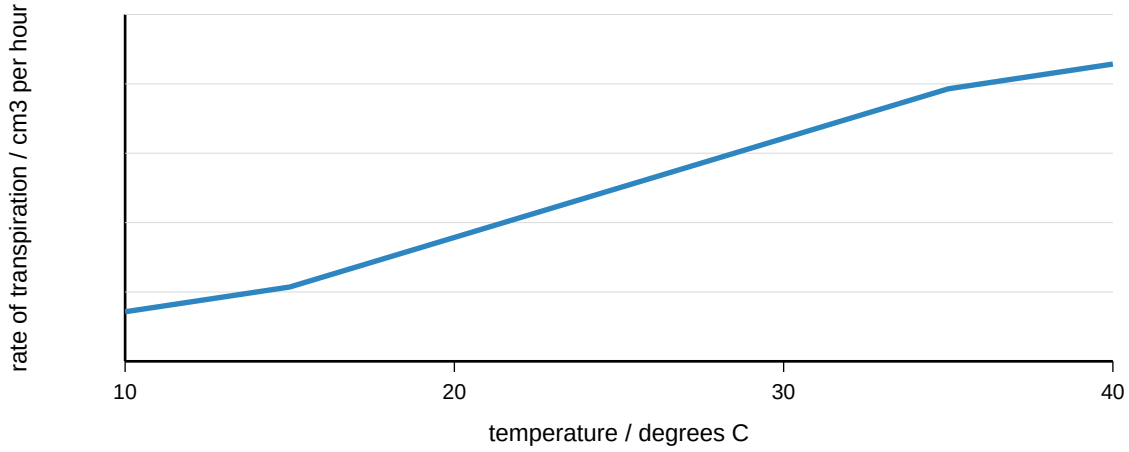
Which feature of the villus increases the rate of absorption?



A It has a large surface area.
B It has a thick wall.
C It contains no blood vessels.
D It produces bile.

8 The graph shows the effect of temperature on the rate of transpiration.

What is the rate of transpiration at 30 degrees C?



A 2.0 cm3/h

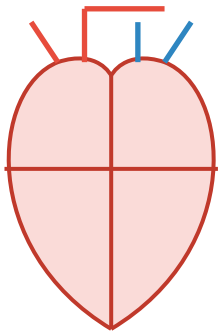
B 3.5 cm3/h

C 4.5 cm3/h

D 5.0 cm3/h

9 The diagram shows the circulatory system.

Which blood vessel carries deoxygenated blood from the heart to the lungs?



A aorta
B pulmonary artery
C pulmonary vein
D vena cava

10 The table shows the composition of blood entering and leaving the lungs.

Which row is correct?

	oxygen content entering lungs	oxygen content leaving lungs	CO2 content entering lungs	CO2 content leaving lungs
A	low	high	high	low
B	high	low	low	high
C	low	high	low	high
D	high	low	high	low

11 Which row correctly compares aerobic and anaerobic respiration?

	oxygen required	energy released	products in muscles
A	aerobic: no	aerobic: large	aerobic: CO_2 + water
B	aerobic: yes	aerobic: large	aerobic: CO_2 + water
C	anaerobic: yes	anaerobic: small	anaerobic: lactic acid
D	anaerobic: no	anaerobic: large	anaerobic: CO_2 + water

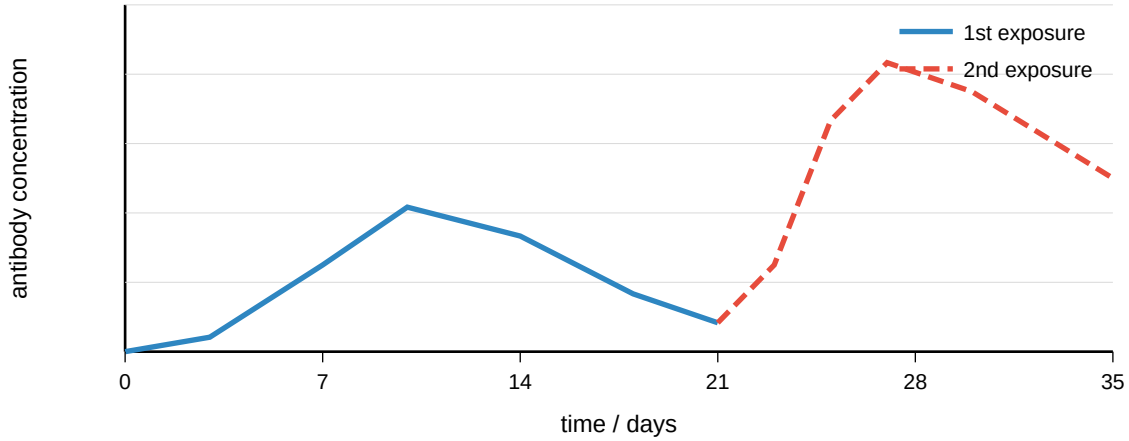
12 The table shows four diseases and their methods of transmission.

Which disease is spread through contaminated water?

	disease	method of transmission
A	AIDS	body fluids
B	cholera	contaminated water
C	influenza	airborne droplets
D	malaria	mosquito vector

13 The graph shows the concentration of antibodies in the blood after a first and second exposure to the same pathogen.

What can be concluded from the graph?



A The first response produces more antibodies than the second.

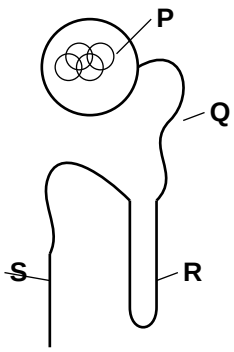
B The second response is faster and produces more antibodies.

C Antibodies are produced at the same rate in both responses.

D The second response takes longer than the first.

14 The diagram shows a nephron in the kidney.

In which part does ultrafiltration occur?



A P
B Q
C R
D S

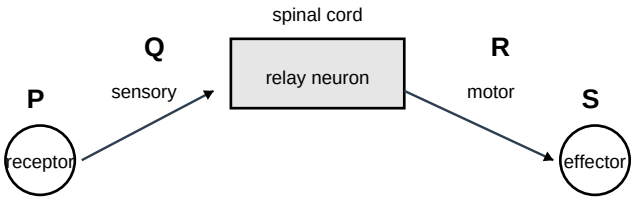
15 The table shows substances found in blood plasma and in normal urine.

Which substance is not normally found in the urine of a healthy person?

	substance	in blood plasma	in normal urine
A	glucose	present	absent
B	salt	present	present
C	urea	present	present
D	water	present	present

16 The diagram shows a reflex arc.

Which is the correct pathway for a nerve impulse in a reflex action?



A effector -> motor neuron -> relay neuron -> sensory neuron -> receptor
B receptor -> motor neuron -> relay neuron -> sensory neuron -> effector
C receptor -> sensory neuron -> relay neuron -> motor neuron -> effector
D effector -> sensory neuron -> relay neuron -> motor neuron -> receptor

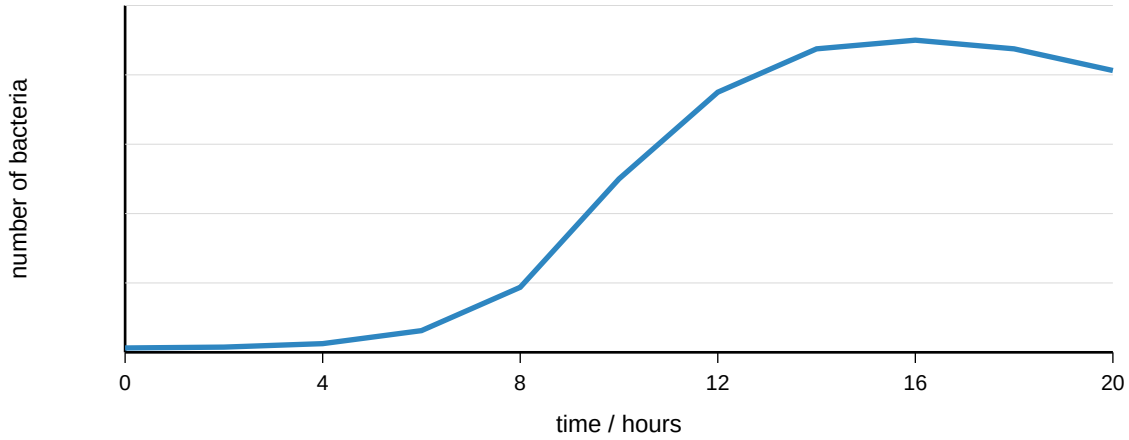
17 The table shows the effect of two hormones on blood glucose concentration.

Which row is correct?

	insulin	glucagon
A	increases blood glucose	decreases blood glucose
B	increases blood glucose	increases blood glucose
C	decreases blood glucose	increases blood glucose
D	decreases blood glucose	decreases blood glucose

18 The graph shows the growth of a population of bacteria over time.

During which phase is the rate of reproduction greatest?



A P
B Q
C R
D S

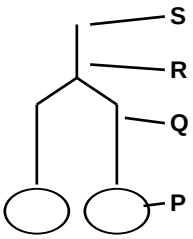
19 The table shows features of different processes.

Which process produces genetically identical offspring?

	process	offspring genetically
A	cross-pollination	varied
B	fertilisation	varied
C	meiosis	varied
D	mitosis	identical

20 The diagram shows the male reproductive system.

Which part produces sperm cells?



A P
B Q
C R
D S

21 A plant with red flowers (RR) is crossed with a plant with white flowers (rr). All the offspring have pink flowers.

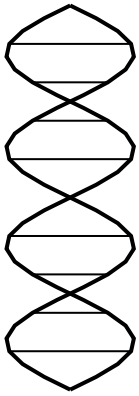
What type of inheritance is shown?

	r	**r**	
R	Rr	Rr	
R	Rr	Rr	

A codominance
B complete dominance
C incomplete dominance
D sex-linked inheritance

22 The diagram shows a DNA molecule.

Which bases pair together in DNA?



A adenine with cytosine
B adenine with guanine
C adenine with thymine
D cytosine with thymine

23 The table shows the number of chromosomes in different types of human cells.

Which row is correct?

	body cell	gamete
A	23	46
B	46	23
C	46	46
D	23	23

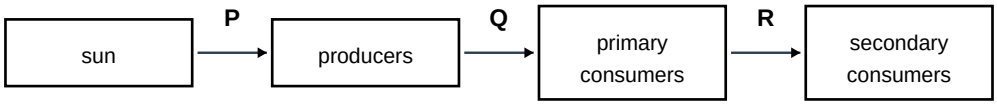
24 The table shows how different processes affect genetic variation.

Which process increases the variety of organisms in a population?

	process	effect on variation
A	asexual reproduction	no increase
B	cloning	no increase
C	mitosis	no increase
D	sexual reproduction	increases variation

25 The diagram shows an energy flow through an ecosystem.

What percentage of the energy from the producers is transferred to the primary consumers?



A 1%
B 10%
C 50%
D 90%

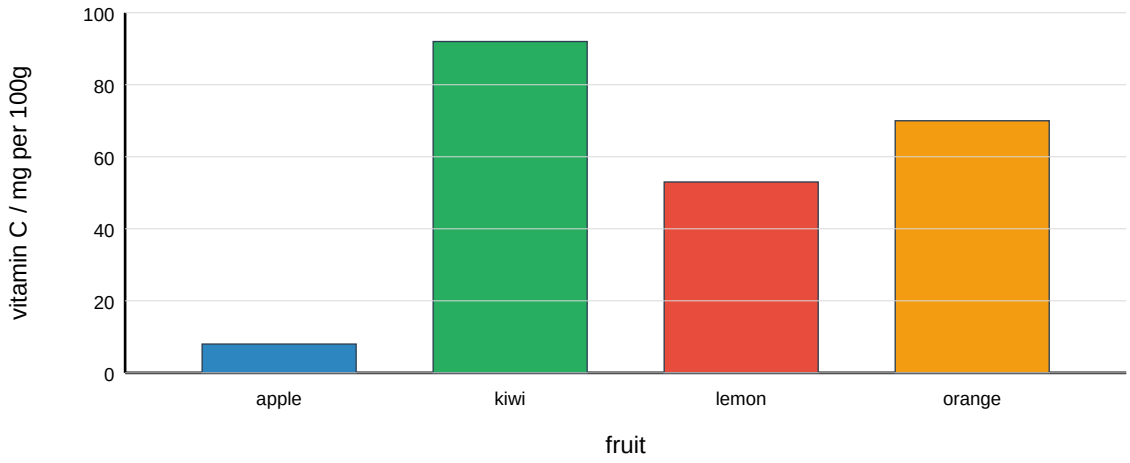
26 The table shows the effect of different human activities on biodiversity.

Which activity is most likely to cause a decrease in biodiversity?

	activity	effect on biodiversity
A	building nature reserves	increases
B	deforestation	decreases
C	planting trees	increases
D	recycling waste	no direct effect

27 The bar chart shows the vitamin C content of four different fruits.

Which fruit has the highest vitamin C content?



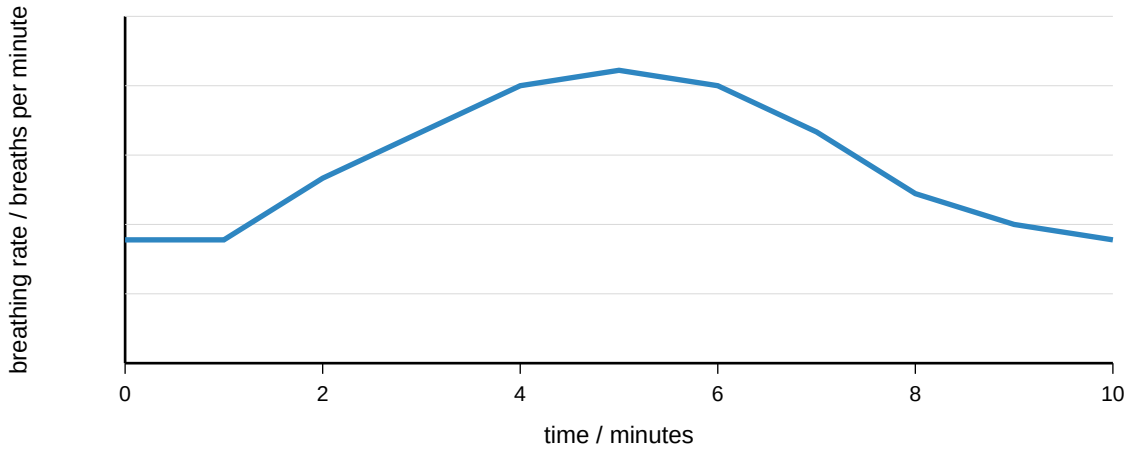
A apple
B kiwi
C lemon
D orange

28 Which row correctly describes the function of bile?

	where bile is made	where bile is stored	function of bile
A	gall bladder	liver	digests protein
B	gall bladder	liver	emulsifies fats
C	liver	stomach	digests protein
D	liver	gall bladder	emulsifies fats

29 The graph shows the effect of exercise on breathing rate.

How long did it take for the breathing rate to return to normal after exercise stopped?



A 2 minutes
B 4 minutes
C 6 minutes
D 8 minutes

30 The table shows different blood cells and their functions.

Which type of white blood cell produces antibodies?

	cell type	function
A	lymphocyte	produces antibodies
B	phagocyte	engulfs pathogens
C	platelet	helps blood clotting
D	red blood cell	transports oxygen

31 The table shows the water potential of three solutions.

In which direction will water move by osmosis?

solution	water potential / arbitrary units
1	-200
2	-400
3	-600

A from solution 1 to solution 2

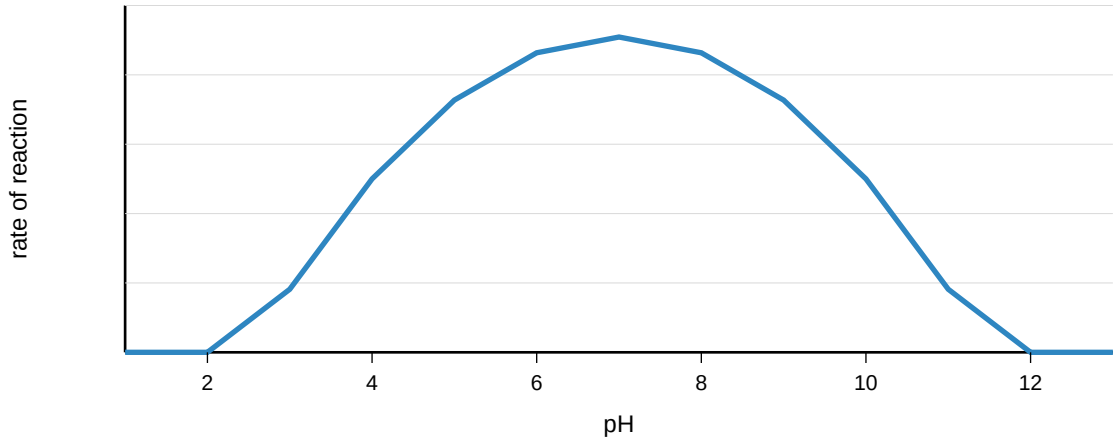
B from solution 2 to solution 1

C from solution 3 to solution 1

D from solution 1 to solution 3

32 The graph shows the rate of enzyme activity at different pH values.

At which pH is the enzyme most active?



A 2
B 4
C 7
D 10

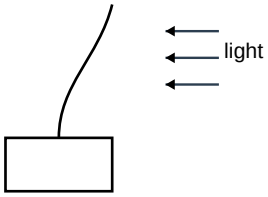
33 The table shows statements about the placenta during pregnancy.

Which statement is correct?

	statement about placenta
A	allows blood of mother and fetus to mix
B	provides site for exchange of substances
C	produces sperm cells
D	stores urine from the fetus

34 The diagram shows a plant with shoots growing towards the light.

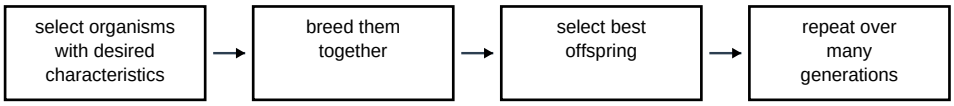
Which hormone causes this response?



A adrenaline
B auxin
C insulin
D oestrogen

35 Selective breeding is used to produce cattle that give more milk.

Which is the correct sequence of steps?



A select best cattle -> breed them together -> select best offspring -> repeat
B breed any cattle -> select worst offspring -> breed them -> repeat
C clone the best cattle -> breed clones -> select offspring
D genetically modify cattle -> breed them -> select offspring

36 The table shows the percentage of different gases in inhaled and exhaled air.

Which gas shows the greatest percentage change?

gas	inhaled air / %	exhaled air / %
nitrogen	78	78
oxygen	21	16
carbon dioxide	0.04	4
water vapour	variable	saturated

A carbon dioxide
B nitrogen
C oxygen
D water vapour

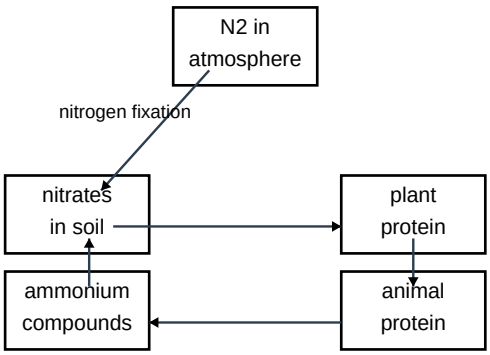
37 The table shows different techniques used in biology.

Which is an example of genetic modification?

	technique	description
A	selective breeding	breeding two varieties together
B	cloning	producing identical copy from adult cell
C	genetic modification	inserting gene into another organism
D	artificial selection	selecting best animals for breeding

38 The diagram shows the nitrogen cycle.

Which process converts nitrogen gas into a form that plants can use?



A denitrification
B decomposition
C nitrification
D nitrogen fixation

39 A student investigated the distribution of dandelions in a field using quadrats.

The table shows the results.

What is the estimated population of dandelions in the whole field?

	value
area of field / m2	1000
area of each quadrat / m2	0.25
number of quadrats used	10
total number of dandelions counted	10

A 200

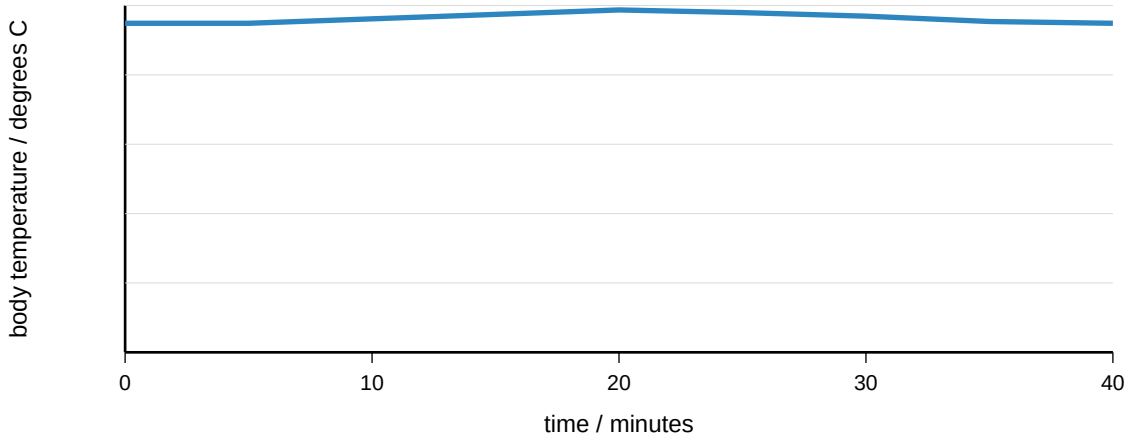
B 2000

C 4000

D 20000

40 The graph shows the change in body temperature of a person during exercise.

Which mechanism helps to cool the body during exercise?



A constriction of blood vessels in the skin

B decreased sweating

C increased sweating

D shivering