National Qualifications 2026

X807/75/02

Biology
Section 1 — Questions

TUESDAY, 28 APRIL

1:00 PM – 3:30 PM

Instructions for the completion of Section 1 are given on *page 02* of your question and answer booklet X807/75/01.

Record your answers on the answer grid on *page 03* of your question and answer booklet.

You must leave your answer booklet on your desk; if you do not, you could lose all the marks for this paper.

X8077502

Qualifications Scotland
Teisteanasan Alba

SECTION 1 — 25 marks

Attempt ALL questions

1. Which of the following cell structures contains chlorophyll?

   A Cell wall
   B Chloroplast
   C Cytoplasm
   D Mitochondrion

2. A piece of potato that was left in a solution for 24 hours was found to have increased in mass.

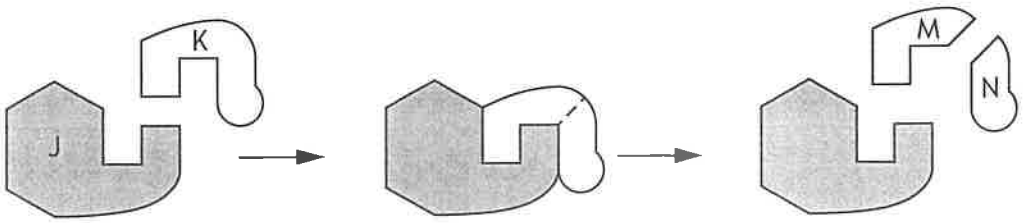
   The cells of the potato had

   A burst
   B become plasmolysed
   C become turgid
   D shrunk.

3. Messenger RNA (mRNA) is produced in the

   A nucleus and is complementary to the DNA strand
   B nucleus and is identical to the DNA strand
   C ribosome and is complementary to the DNA strand
   D ribosome and is identical to the DNA strand.

4. The diagram represents three stages in an enzyme-controlled reaction.



Which row in the table identifies the labelled structures?

	Substrate	Enzyme	Product
A	K	N	J
B	M	J	K
C	J	K	M
D	K	J	N

5. After the process of genetic engineering, a host bacterial cell will

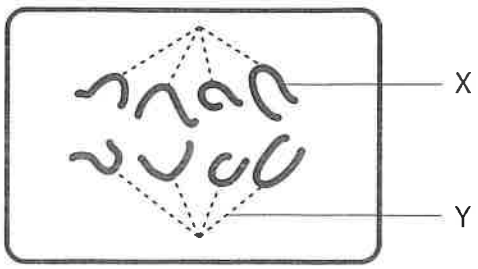
A have a required gene extracted
B be missing a plasmid
C contain a modified plasmid
D have a source chromosome inserted.

6. Which type of proteins control respiration?

A Antibodies
B Structural
C Receptors
D Enzymes

[Turn over

7. The diagram represents a stage in the process of mitosis.



Which row in the table identifies structures X and Y?

	X	Y
A	chromatid	spindle fibre
B	chromosome	equator
C	chromatid	equator
D	chromosome	spindle fibre

8. The flowchart shows how water concentration is controlled in the human body.

brain detects a decrease in water concentration

↓

hormone is released

↓

kidneys regulate water concentration

↓

brain detects that water concentration returns to normal

The receptors for this hormone would be found in

A the brain
B the blood
C the kidney
D an endocrine gland.

9. Which of these cells is haploid?

A Red blood cell
B Ovum
C Zygote
D Companion cell

10. Which of these characteristics are both examples of continuous variation?

A Leaf length and seed mass
B Leaf length and blood group
C Seed mass and eye colour
D Blood group and eye colour

11. In pea plants, the allele for hairy stems is dominant and the allele for smooth stems is recessive.

Two heterozygous pea plants were crossed, and 180 offspring were produced.

What would be the expected number of pea plants with smooth stems?

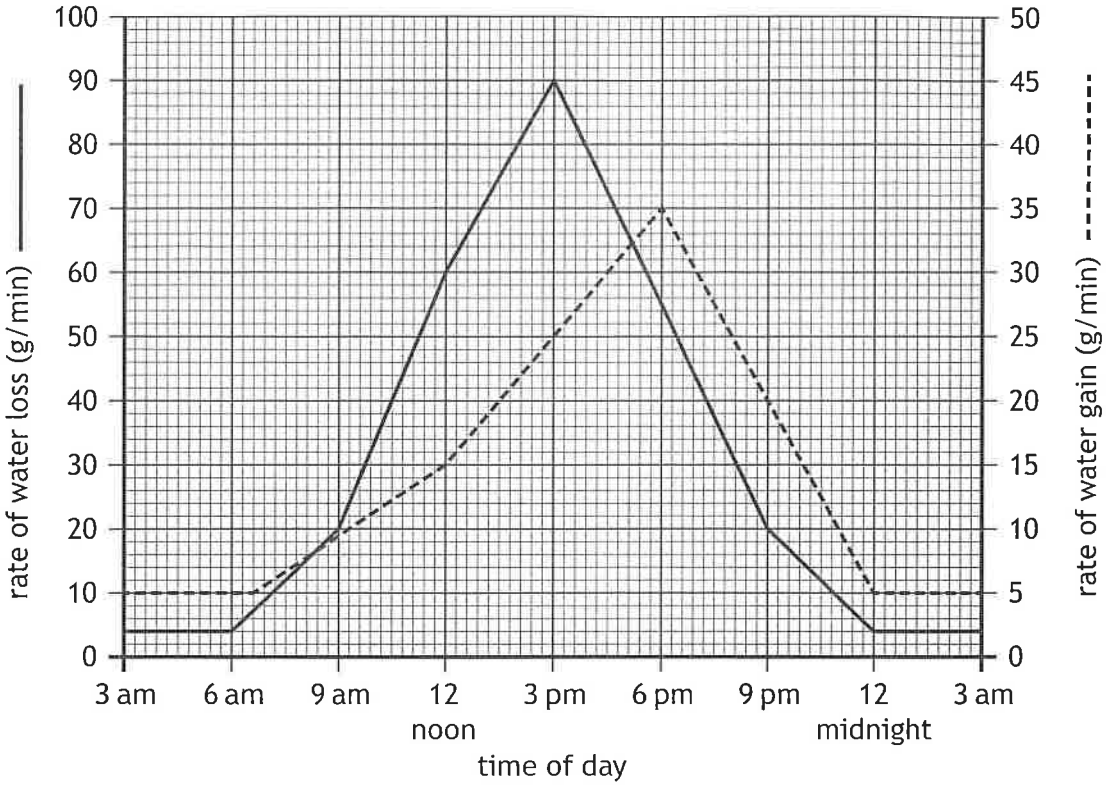
A 45
B 60
C 90
D 135

12. In plants, sugar is transported

A up and down in dead phloem cells
B up and down in living phloem cells
C only down in living phloem cells
D only up in dead phloem cells.

[Turn over

13. The graph shows the rate of water loss and water gain by a plant in 24 hours.



What was the rate of water gain at 3 pm?

A 25 g/min
B 45 g/min
C 50 g/min
D 90 g/min

14. The table shows the average blood pressure measurement in three different blood vessels.

Blood vessel	Blood pressure (units)
Artery	90
Capillary	15
Vein	3

The percentage decrease in blood pressure when blood flows from a capillary into a vein is

A 12
B 20
C 80
D 400

15. Three athletes followed a 6-month training programme. On the first day of each month, they took a fitness test in which their rate of oxygen absorption was measured.

An increase in fitness is shown by an increase in the rate of oxygen absorption.

The results of these tests are shown in the table.

Month of training programme	Rate of oxygen absorption (units)		
	Athlete W	Athlete X	Athlete Y
1	59.0	39.1	45.0
2	62.5	45.0	47.5
3	67.4	50.0	51.5
4	70.1	53.2	54.2
5	70.4	53.2	55.7
6	70.8	53.6	57.1

Which of the following statements is **not** correct?

A Athlete W's fitness improved the least over the 6-month training programme.

B Athlete X's fitness improved the most over the 6-month training programme.

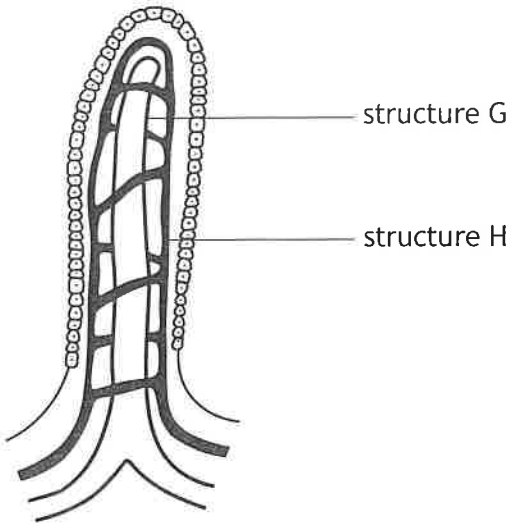
C Athlete Y's fitness improved the least in the first 3 months of the training programme.

D All the athletes' fitness had improved by more than 25% by the end of the training programme.

[Turn over

16. Nutrients from food are absorbed by the villi in the small intestine.

The diagram shows a villus.



Which row in the table identifies a substance absorbed by each of the labelled structures?

	Structure G	Structure H
A	glucose	amino acids
B	fatty acids	glycerol
C	fatty acids	amino acids
D	glucose	glycerol

17. Interspecific competition occurs between individuals of

A the same species for a few of the resources they require
B the same species for all the resources they require
C different species for a few of the resources they require
D different species for all the resources they require.

18. An example of an abiotic factor affecting a population of fish in a river could be

A a fungal infection on their skin
B predation from large birds
C competition between them for food
D decreasing water pH due to pollution.

19. The table shows the number of different invertebrates collected from several pitfall traps in a woodland ecosystem.

Invertebrates	Number
Earthworm	8
Woodlice	10
Spiders	12
Beetles	34
Flatworms	16

What percentage of all the invertebrates were earthworms?

A 8
B 10
C 16
D 20

20. The table shows the effects of grazing intensity on the number of plant species.

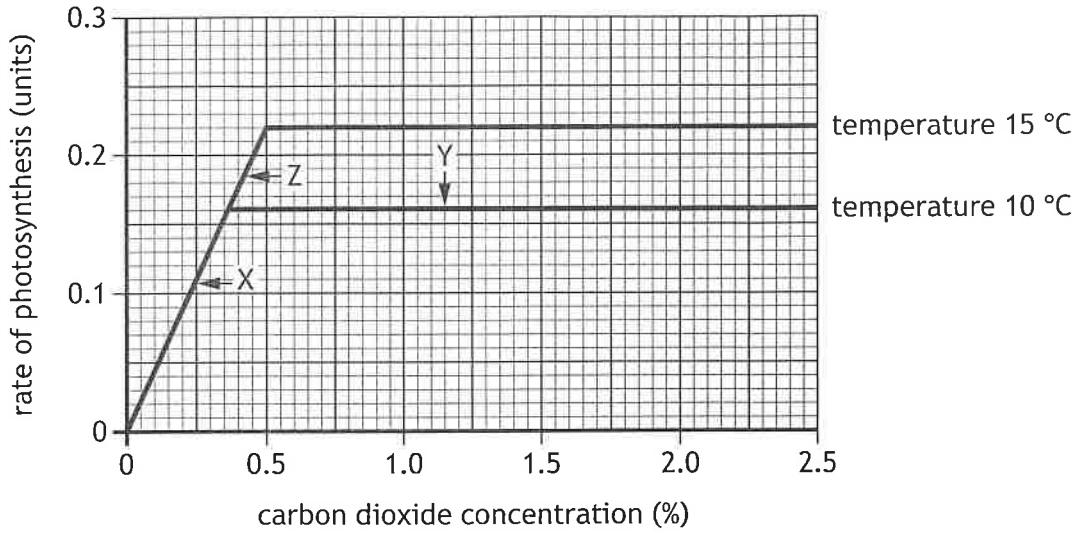
Grazing intensity	Number of annual plant species	Number of perennial plant species
Low	1	8
Moderate	9	11
High	0	7

Which statement is correct for the data shown?

A The population of annual plant species is lowest when grazing intensity is low.
B Plant biodiversity increases when grazing intensity is increased from low to high.
C The population of perennial plant species is highest when grazing intensity is moderate.
D Plant biodiversity increases when grazing intensity is increased from low to moderate.

[Turn over

21. The graph shows the effects of increasing temperature and carbon dioxide concentration on the rate of photosynthesis.



Which statement is correct for the data shown?

A Temperature is the limiting factor at point X.

B Carbon dioxide concentration is the limiting factor at point X.

C Carbon dioxide concentration is the limiting factor at point Y.

D Temperature is the limiting factor at point Z.

22. Indicator species in an ecosystem can provide information about

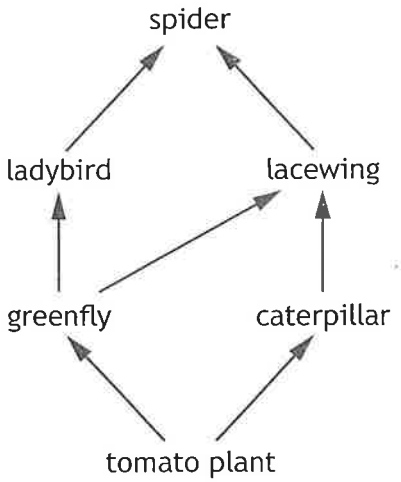
A levels of pollution

B levels of competition

C number of predator species present

D the total numbers of organisms present.

Questions 23 and 24 refer to the following food web.



23. Pesticides enter the food chain when they are sprayed on tomato plants.

Identify the organism that would accumulate the greatest concentration of pesticides in its tissues over a period of time.

A Tomato plant

B Greenfly

C Lacewing

D Spider

24. A gardener noticed an increase in caterpillar damage to their tomato plants and decided to use biological control to deal with this.

Which species should the gardener introduce more of?

A Greenfly

B Lacewing

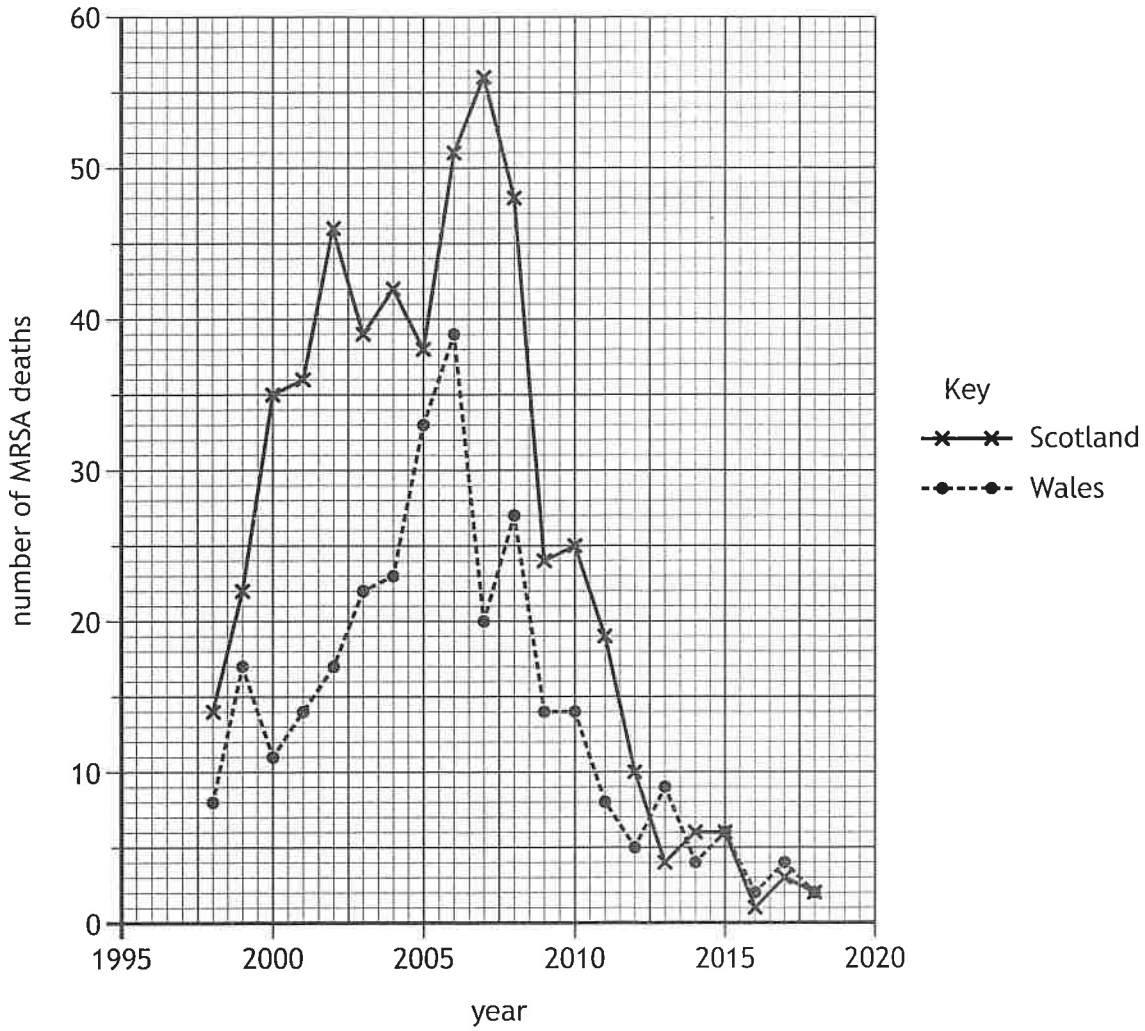
C Ladybird

D Spider

[Turn over

25. MRSA is a type of bacterial pathogen resistant to some common antibiotics.

The graph shows the number of MRSA deaths in Scotland and Wales over a 20-year period.



Which of the following is correct for this data?

The number of MRSA deaths

A in Scotland and Wales increased every year up to 2007

B in Scotland were three times higher than in Wales in 2007

C in Scotland were twice as high as in Wales in 2012

D in Scotland and Wales decreased every year from 2008 to 2018.

[END OF SECTION 1. NOW ATTEMPT THE QUESTIONS IN SECTION 2 OF YOUR QUESTION AND ANSWER BOOKLET.]