[Braille page 1] X807/75/02 PRINT COPY BRAILLE

N5

National Qualifications

2025

Biology

Section 1

Tuesday, 27 May

Instructions to Candidates

Candidates should enter their surname, forename(s), date of birth, Scottish candidate number and the name and level of the subject at the top of their first answer sheet.

Section 1 — 25 marks

Attempt ALL questions

The answer to each question is either A, B, C or D. There is only one correct answer to each question. Decide what your answer is, then write the question number and the letter eg 1. D, 2. A.

Sample question

ow 1. The thigh bone is called the

A. Humerus

B. Femur

C. Tibia

D. Fibula

The correct answer is B. Femur. You write 1. B

If you decide to change your answer, **[Braille page 2]** cancel your first answer by brailling it out and write the answer you want.

Tactile diagrams are produced in a separately bound booklet.

Questions marked with an asterisk differ in some respect from those in the printed paper.

You must clearly identify the question number you are attempting on your answer sheet.

Marks are shown in square brackets at the end of each question or part question.

An ow in the margin indicates a new question.

[Braille page 3] SECTION 1 — 25 marks

Attempt ALL questions

ow 1. Which of the following structures would not be found in a typical plant cell?

A. Chloroplast
B. Cell membrane
C. Plasmid
D. Mitochondrion

ow 2. Potato cylinders were placed into different concentrations of sucrose solution and any change in mass was recorded.

The table shows the initial sucrose concentrations inside the potato cells and the concentrations of the solutions they were placed in.

Which potato cylinder will gain the most mass?

[In the table below, option is followed by: Initial sucrose concentration inside potato cells (mol/dm^3); Sucrose concentration of solution (mol/dm^3).]

A: 0.31; 0.45.
B: 0.35; 0.35.
C: 0.31; 0.25.
D: 0.35; 0.21.

[Braille page 4]

ow 3. In a section of DNA, 34% of the bases are thymine.

Which row in the table shows the percentages of the other bases in this section of DNA?

[In the table below, row is followed by: Adenine; Cytosine; Guanine.]

A: 16; 34; 34.
B: 34; 34; 16.
C: 34; 16; 16.
D: 16; 16; 34.

[Braille page 5]

ow * 4. Lipase is an enzyme that speeds up the breakdown of fats, producing an acid that decreases the pH.

Three test tubes were set up to investigate the action of lipase on fat in milk.

Each test tube contained the same total volume of liquid.

Test tube R contained milk and lipase

Test tube S contained milk and water

Test tube T contained milk and boiled lipase

The pH of each test tube was recorded at the start of the experiment and then again 20 minutes later.

In which of the test tube(s) would the pH stay the same?

A. R only
B. T only
C. R and T
D. S and T

[Braille page 6]

ow 5. A 100 g sample of haemoglobin was found to contain 15 g of leucine.

What mass of leucine would be found in a 5 g sample of haemoglobin?

A. 0.15
B. 0.75
C. 20.0
D. 75.0

ow 6. A culture of 350 bacterial cells was genetically engineered to produce a human protein.

Only 210 cells successfully produced the protein.

The percentage success was

A. 40
B. 60
C. 67
D. 140.

ow 7. Which of the following builds up in animal cells as a result of fermentation?

A. Lactate
B. Ethanol
C. Glucose
D. Carbon dioxide

[Braille page 7]

ow 8. The apparatus described below was set up to investigate the effect of temperature on fermentation in yeast.

• A boiling tube was three-quarters filled with a glucose and yeast solution.

• A thin layer of oil covered the surface of this solution.

• The boiling tube was sealed with a stopper.

• One end of an inverted U-shaped tube was inserted through a hole in the stopper into the air space at the top of the boiling tube.

• The other end of the U-shaped tube went into a beaker of water.

• Gas from the boiling tube passed through the U-shaped tube and bubbled out through the water.

• The boiling tube containing the glucose and yeast solution was placed in a water bath.

The investigation was carried out at 15 °C and repeated at 20 °C and 30 °C. The number of gas bubbles produced was counted.

[Braille page 8] Which two variables should be kept constant during the investigation?

A. Temperature and time left for
B. Type of yeast and time left for
C. Temperature and carbon dioxide concentration
D. Type of yeast and carbon dioxide concentration

ow 9. During mitosis, which of the following occurs immediately before the cytoplasm divides?

A. Nuclear membranes form.
B. Chromosomes line up at the equator.
C. Pairs of chromatids are separated.
D. Chromosomes shorten and thicken.

ow 10. The function of an inter neuron is to carry electrical impulses from

A. a motor neuron to a sensory neuron
B. an effector to a sensory neuron
C. a sensory neuron to a motor neuron
D. a motor neuron to an effector.

[Braille page 9]

ow 11. Which row in the table identifies features of the hormone glucagon?

[In the table below, row is followed by: Site of production; Target organ; Effect.]

A: pancreas; liver; glycogen → glucose.
B: liver; pancreas; glycogen → glucose.
C: pancreas; liver; glucose → glycogen.
D: liver; pancreas; glucose → glycogen.

[Braille page 10]

ow 12. The table shows the number of people recorded as having diabetes in Scotland over a 5-year period.

[In the table below, Year is followed by: Number of people with diabetes.]

1: 278000

2: 284000

3: 291000

4: 298000

5: 304000

Predict the number of people likely to have diabetes in year 10 if the average yearly increase continues.

A. 330000
B. 336500
C. 582000
D. 608000

[Braille page 11]

ow 13. The table gives data on the number of eggs produced and the percentage of eggs surviving to adulthood in three different organisms.

[In the table below, Organism is followed by: Number of eggs produced; Number surviving to adulthood; Percentage of eggs surviving to adulthood.]

Brown trout: 3000; 270; 9.

Salmon: 2000; 150; 7.5.

Common frog: _; 23; 5.

The number of eggs produced by the common frog was

A. 28
B. 115
C. 437
D. 460.

ow * 14. Refer to the diagram for question 14. The graph shows the growth of a foetus.

The average monthly increase in the length of the foetus from month 5 to month 9 is

A. 40 mm
B. 50 mm
C. 200 mm
D. 372 mm

[Braille page 12]

ow 15. In guinea pigs, short coat is dominant to long coat.

A group of heterozygous guinea pigs were crossed and a total of 72 offspring were produced.

Identify how many of the offspring would be expected to have short coats.

A. 18
B. 36
C. 54
D. 72

ow 16. Refer to the diagram for Question 16. The diagram shows a sequence of part of the blood flow through the body.

Which row in the table identifies E, F and G?

[In the table below, row is followed by: E; F; G.]

A: right ventricle; pulmonary artery; pulmonary vein.
B: right ventricle; pulmonary vein; pulmonary artery.
C: pulmonary artery; right ventricle; pulmonary vein.
D: pulmonary vein; right ventricle; pulmonary artery.

[Braille page 13]

ow 17. Three students carried out an investigation into the effect of exercise on heart rate.

Each student measured their heart rate after completing the same exercises.

After each student's heart rate returned to its resting rate, they repeated the investigation.

Which of the following would improve the reliability of the results?

A. Increasing the rest period before repeating the exercise.
B. Completing the exercise in a different location.
C. Changing the type of exercise each time.
D. Increasing the number of students exercising.

[Braille page 14]

ow * 18. Refer to the diagram for Question 18. Samples of water were taken from a river at a sewage outlet and at a number of points downstream.

The graph shows the oxygen content of the water at different distances downstream from the outlet.

What is the percentage increase in the oxygen content from 250 m to 1000 m from the outlet?

A. 19
B. 95
C. 1900
D. 3900

ow 19. Seals and dolphins compete for food.

Which row in the table describes the interaction between these organisms?

[In the table below, row is followed by: Type of competition; Type of factor.]

A: intraspecific; biotic.
B: intraspecific; abiotic.
C: interspecific; biotic.
D: interspecific; abiotic.

[Braille page 15]

ow * 20. An experiment was set up to investigate the conditions needed for photosynthesis.

4 identical sealed tubes were set up each containing pondweed and water. 2 tubes were sealed in a black box.

[In the table below, Tube number is followed by: Condition; Carbon dioxide concentration.]

1: light; 0.03%.

2: light; 0.3%.

3: dark; 0.03%.

4: dark; 0.3%.

Which two tubes should be compared to show the effect of light on photosynthesis?

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

[Braille page 16]

ow 21. Refer to the diagram for Question 21. The graph shows the effect of limiting factors on the rate of photosynthesis.

Which row in the table identifies the limiting factors at points X and Y on the graph?

[In the table below, row is followed by: X; Y.]

A: light intensity; temperature.
B: light intensity; CO_2 concentration.
C: temperature; light intensity.
D: CO_2 concentration; light intensity.

ow 22. Refer to the diagrams for Question 22. The diagrams represent pyramids of numbers.

Which pyramid represents the following food chain?

grass → rabbit → fox → fleas

[Braille page 17]

ow 23. Refer to the diagram for Question 23. Researchers investigated natural selection in a population of owls.

The graph shows changes to the percentage of owls with brown feathers over time.

Which of the following statements is correct?

The percentage of owls with brown feathers

A. doubles between 1993 and 2003
B. increases continually between 1983 and 2008
C. increases more between 1988 and 1993 than in any other 5-year period
D. increases less between 1993 and 1998 than between 2003 and 2008.

ow 24. Nematode worms are used by farmers to prey upon insects that damage their crops.

This method used to increase crop yield is an example of

A. genetic modification
B. biological control
C. pesticide use
D. fertiliser use.

[Braille page 18]

ow 25. The number of light and dark peppered moths in a woodland were counted over a 5-year period.

The results are shown in the table.

[In the table below, Year is followed by: Average number of light variety moths; Average number of dark variety moths.]

1: 200; 60.

2: 180; 100.

3: 140; 160.

4: 120; 180.

5: 100; 200.

The percentage of moths counted in year 4 that were the dark variety was

A. 20%
B. 40%
C. 50%
D. 60%.

[END OF SECTION 1]