



National
Qualifications
2014

X707/75/02

Biology
Section 1—Questions

FRIDAY, 16 MAY

9:00 AM – 11:00 AM

Instructions for the completion of Section 1 are given on Page two of your question and answer booklet X707/75/01.

Record your answers on the answer grid on Page three of your question and answer booklet.

Before leaving the examination room you must give your question and answer booklet to the Invigilator; if you do not, you may lose all the marks for this paper.



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SECTION 1

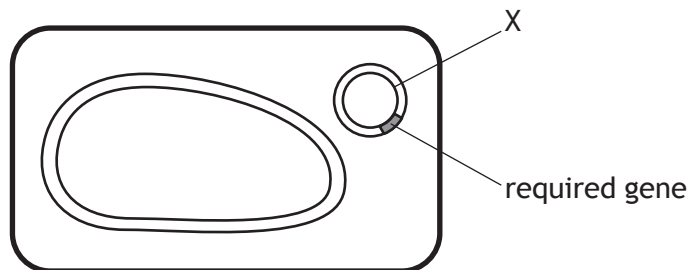
1. Which structural feature is found in a plant cell and not in an animal cell?

- A Nucleus
- B Cell wall
- C Cell membrane
- D Cytoplasm

2. Which line in the table below identifies the direction of diffusion of the three substances during muscle contraction?

	<i>Substance</i>		
	<i>Glucose</i>	<i>Oxygen</i>	<i>Carbon dioxide</i>
A	out	out	in
B	in	out	in
C	out	in	out
D	in	in	out

3. The diagram below represents a genetically engineered bacterial cell.



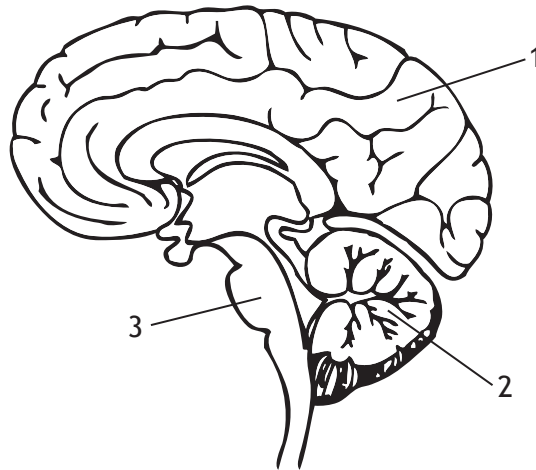
The structure labelled X is a

- A chromosome
- B plasmid
- C ribosome
- D nucleus.

4. The light energy for photosynthesis is captured by

- A water
- B hydrogen
- C chlorophyll
- D oxygen.

5. The diagram below represents the human brain.



Which line in the table below identifies structures 1, 2 and 3 of the human brain?

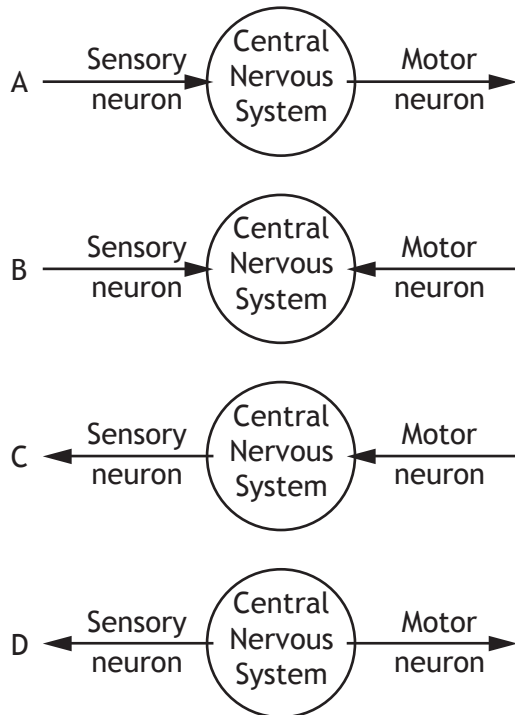
	<i>Structure 1</i>	<i>Structure 2</i>	<i>Structure 3</i>
A	medulla	cerebrum	cerebellum
B	cerebrum	medulla	cerebellum
C	cerebellum	cerebrum	medulla
D	cerebrum	cerebellum	medulla

6. Proteins have different functions. Which of the following statements identifies a **protein** and its function?

- A Hormones carry oxygen around the body.
- B Enzymes carry chemical messages around the body.
- C Antibodies defend the body against disease.
- D Cellulose provides strength and structure to a plant cell wall.

[Turn over

7. Which of the diagrams below identifies neurons and the direction of travel of nerve impulses?



8. Which of the following pairs of human cells have the same number of chromosomes?

- A Liver cell and sperm cell
- B Kidney cell and sperm cell
- C Kidney cell and liver cell
- D Liver cell and egg cell

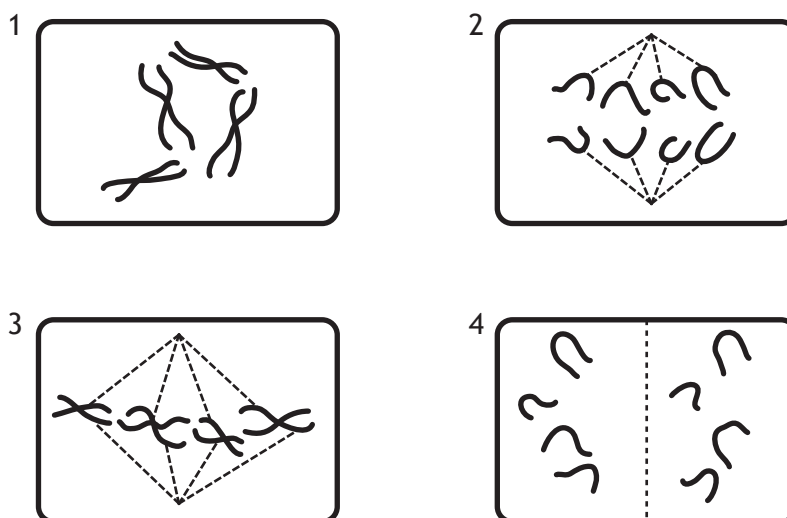
9. The table below shows the results of an investigation into the effect of temperature on egg laying in adult red spider mites.

Feature	Temperature (°C)		
	20 °C	25 °C	30 °C
Average length of egg laying period (days)	24	18	12
Average number of eggs laid per female during egg laying period	72	72	72

As the temperature increases, the average number of eggs laid per female per day

- A increases
- B decreases
- C stays the same
- D halves.

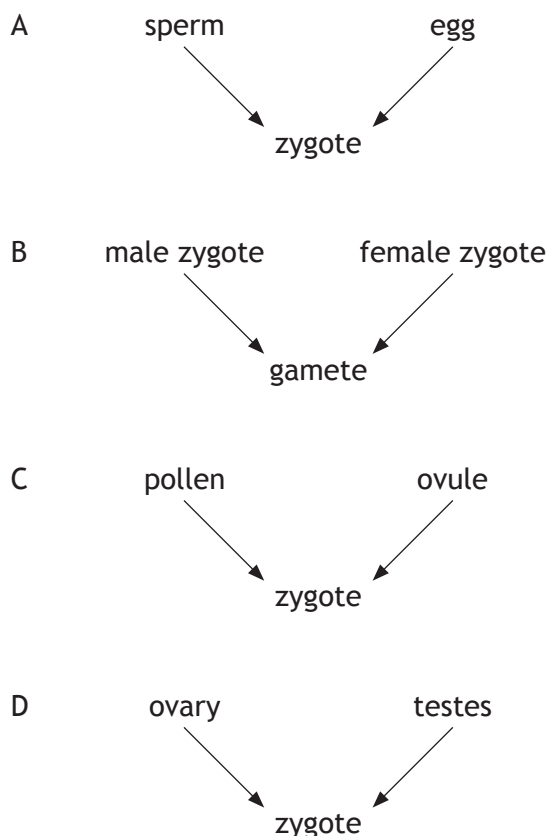
10. The following diagrams show a cell at four different stages of mitosis.



The correct order of the stages of mitosis is

- A 1,3,2,4
- B 2,3,4,1
- C 3,2,1,4
- D 4,1,2,3.

11. Which of the following diagrams represents the process of fertilisation in plants?

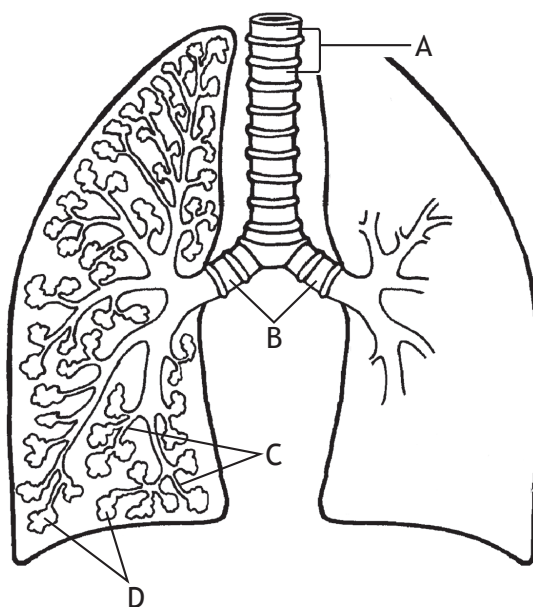


12. Variation in a characteristic can either be discrete or continuous. The range of heights and weights for a group of students were measured and recorded. Ear lobe types were also examined and categorised into groups.

Which line in the table below identifies the type of variation shown by each of these human characteristics?

	<i>Height</i>	<i>Weight</i>	<i>Ear lobe types</i>
A	continuous	continuous	discrete
B	discrete	continuous	continuous
C	discrete	discrete	continuous
D	continuous	discrete	discrete

13. The diagram below shows part of the human respiratory system.



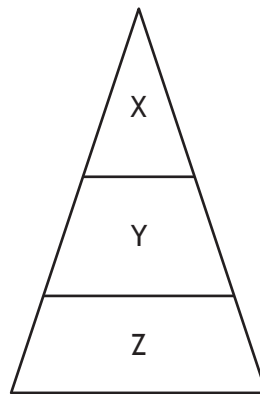
Which letter identifies the alveoli?

14. Which line in the table below identifies abiotic and biotic factors?

	<i>Abiotic factor</i>	<i>Biotic factor</i>
A	light intensity	pH
B	temperature	predation
C	grazing	light intensity
D	predation	grazing

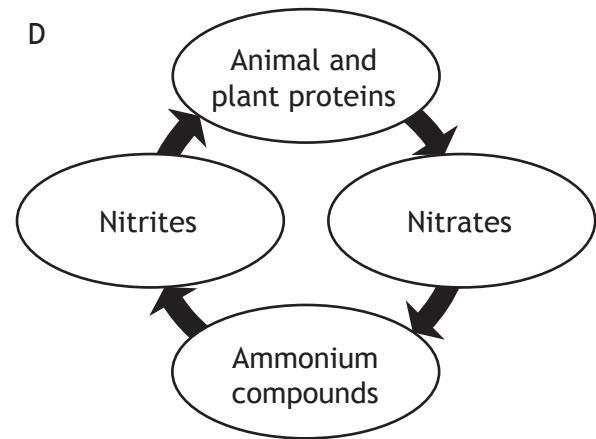
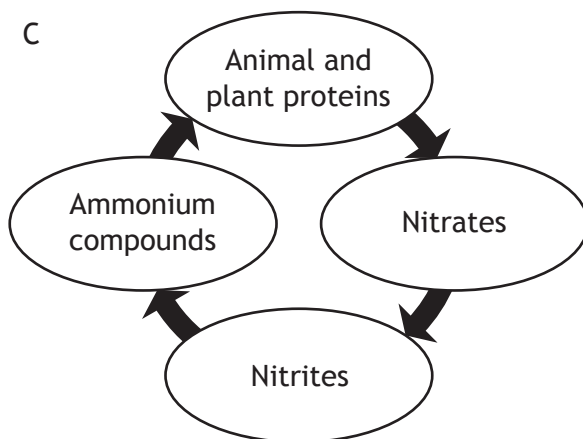
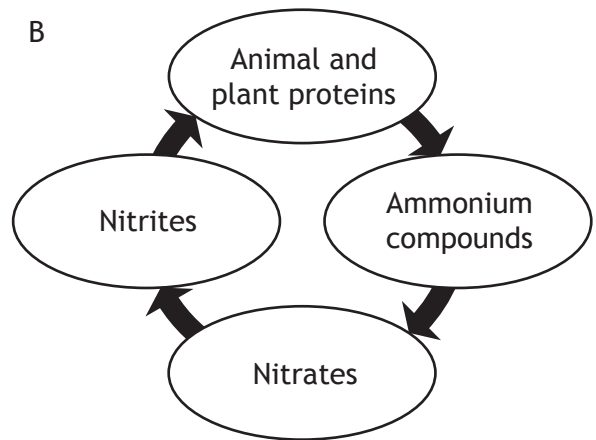
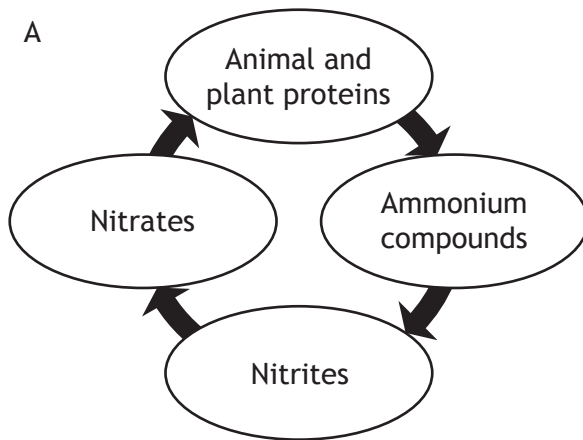
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15. A rabbit feeds on grass, is eaten by foxes and is a habitat for fleas.
The statement above describes the rabbit's
- A ecosystem
 - B community
 - C niche
 - D prey.
16. The diagram below shows the pyramid of energy for a food chain.



- There is a lot less energy at level X in the pyramid because
- A there are fewer organisms at this level
 - B energy is stored at each level
 - C energy is lost at each level
 - D the organisms are bigger at this level.
17. In which of the following would competition **not** occur?
- A Rabbits grazing in a field
 - B Owls and foxes hunting for mice
 - C Daisies and dandelions growing in a lawn
 - D Algae and fish in a loch

18. The following diagrams represent part of the nitrogen cycle. Which diagram shows the correct sequence of events in the nitrogen cycle?



19. Students used a quadrat to estimate the number of buttercups in a field. They threw the quadrat randomly three times in the area. In order to improve the reliability of their results they could have

- A asked another group of students to check that they had counted correctly
- B thrown the quadrat ten times instead of three
- C only thrown the quadrat when conditions were at an optimum
- D used a smaller quadrat for each of their samples.

[Turn over for Question 20 on *Page ten*

20. The table below compares the rate of extinction of mammal species over two different time periods.

<i>Time period (years)</i>	<i>Rate of extinction per 100 years</i>
1500 – 1900	4.5
1900 – 2000	90

The ratio of extinction rates between 1900 – 2000 compared to 1500 – 1900 is

- A 1:20
- B 1:2
- C 2:1
- D 20:1.

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

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