

Paper Reference(s) 9BN0/01
Pearson Edexcel Level 3 GCE

Biology A (Salters Nuffield)
Advanced
PAPER 1: The Natural Environment and
Species Survival

Wednesday 7 June 2023 – Afternoon

Diagram Booklet

In the boxes below, write your name, centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

INSTRUCTIONS

There may be spare copies of some diagrams in case you need them.

**THIS DIAGRAM BOOKLET MUST BE
RETURNED WITH THE QUESTION PAPER
AT THE END OF THE EXAMINATION.**

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Spare Copies

18–19	Question 2(b)
20	Question 9(a)(ii) – Blank

Question 2(b)

Species	Number (n) in pond A	n(n-1) for pond A	Number (n) in pond B	n(n-1) for pond B
Azolla filiculoides	5	20	0	0
Lemna minuta	29	812	0	0
Lemna trisulca	50	2450	0	0
Alisma plantago-aquatica	2	2	0	0
Alopecurus aequalis	11	110	0	0
Carex pseudocyperus	2	2	0	0
Equisetum fluviatile	0	0	71	4970

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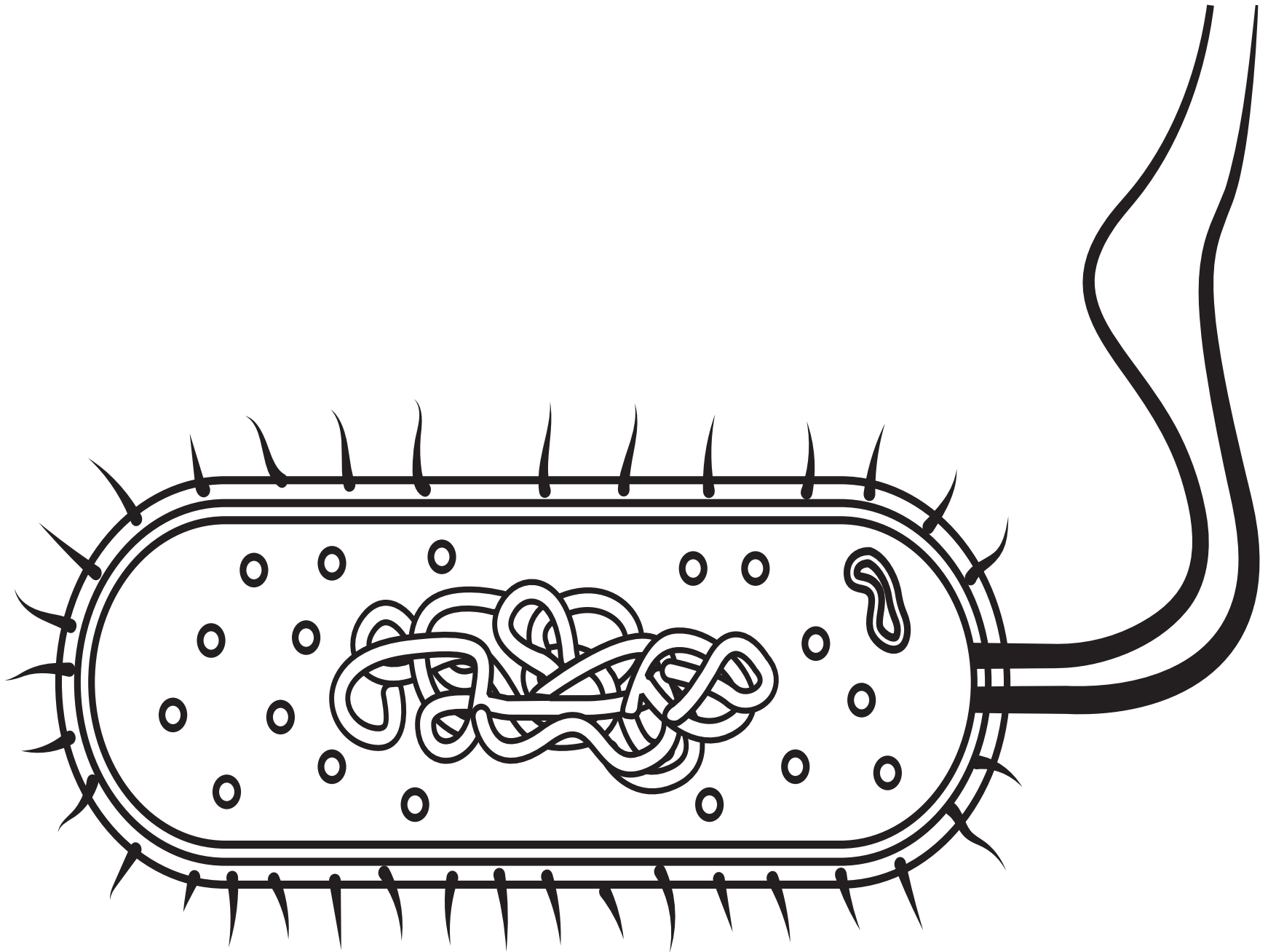
2(b) continued.

Species	Number (n) in pond A	n(n-1) for pond A	Number (n) in pond B	n(n-1) for pond B
Juncus effusus	0	0	60	3 540
Menyanthes trifoliata	16	240	0	0
Polygonum amphibium	0	0	25	600
Ranunculus circinatus	13		0	0
Sparganium erectum	3	6	0	0
Typha latifolia	5	20	0	0
Total			156	9 110

Question 4(a)



Question 7(a)

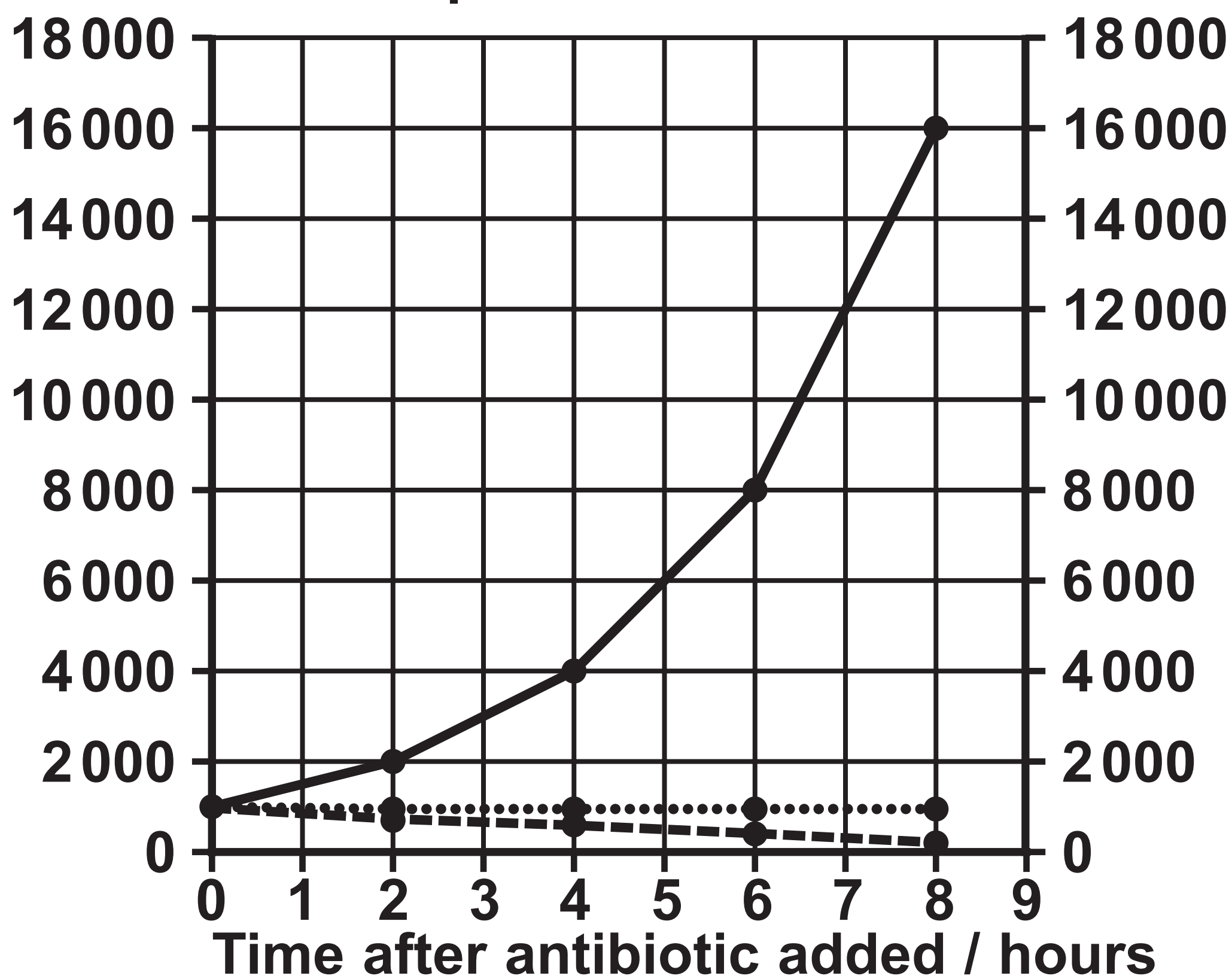


Question 7(b)

Key

- control
-●.... bacteriostatic
- bactericidal

Number of cells per cubic millimetre



Question 7(c)

Mechanism of resistance	Example of antibiotic	How bacteria develop resistance to antibiotic	Example of resistant bacteria
Destruction of the antibiotic	penicillin	Produces enzymes that destroy the drug	Staphylococcus
Decrease in antibiotic uptake	vancomycin	Changes in the permeability of the cell membrane prevent the drug entering the bacterial cell	Pseudomonas

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Mechanism of resistance	Example of antibiotic	How bacteria develop resistance to antibiotic	Example of resistant bacteria
Activation of a transport mechanism	tetracycline	Pumps develop in the cell membrane to remove toxic substances from the cell	Escherichia coli
Modification of target site	linezolid	Mutations in the bacterial DNA causes a change in the target site so the antibiotic can no longer bind to it	Escherichia coli

Question 8

The black and white photograph shows a dense patch of long, thin seagrass.



Question 9(a)

The image shows a chicken with no comb on its head or wattle on its neck. A few feathers are sticking up along its forehead area. It has a short beak with large nostrils.

Bar-headed chicken



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Question 9(a) continued.

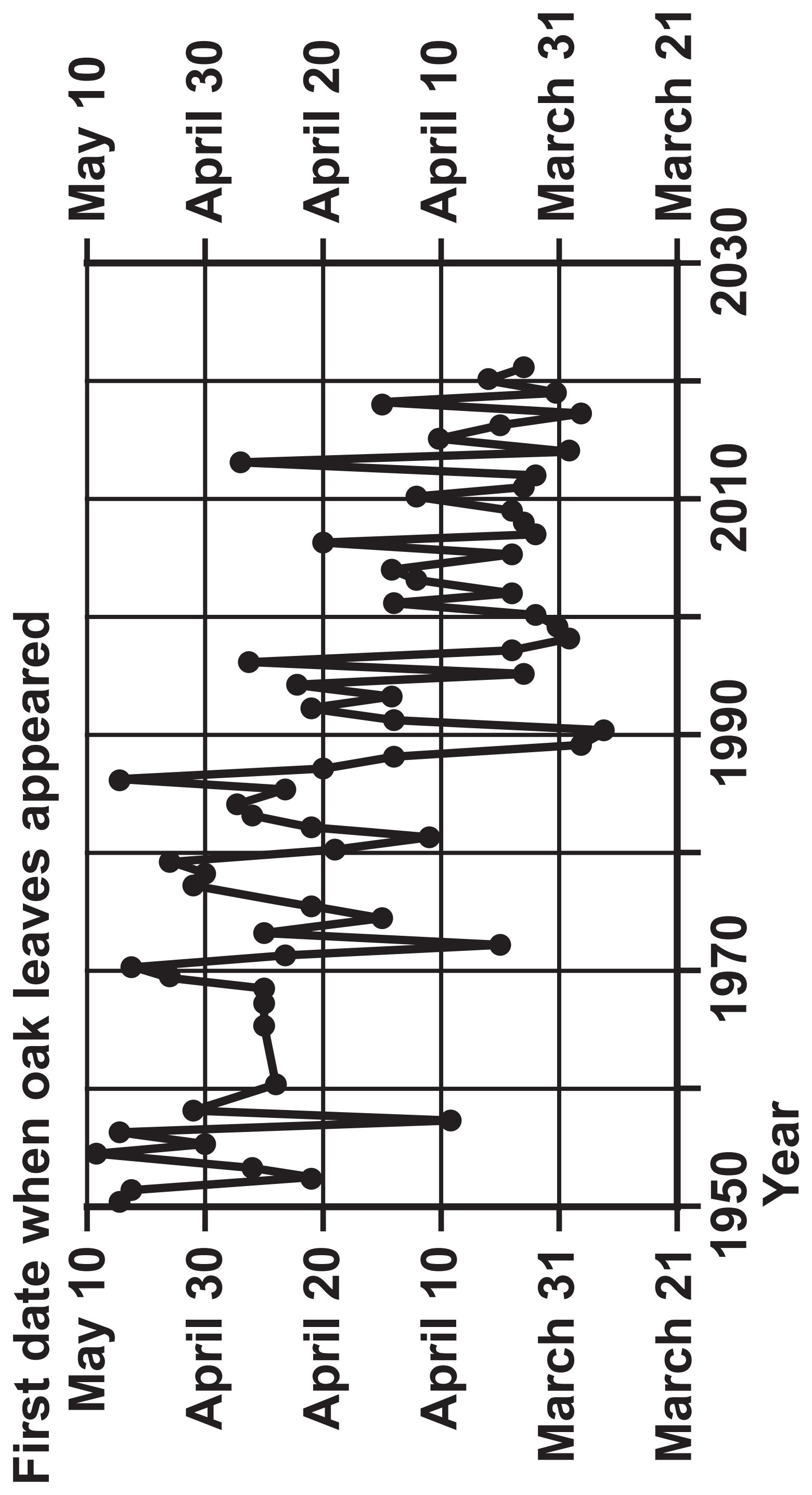
The image shows a chicken with large plumage. It has a small head for its size with a short comb on its head and wattle on its neck. It has a short beak and nostrils.

Black-headed chicken



Question 9(a)(ii) – Blank

Question 10(a)



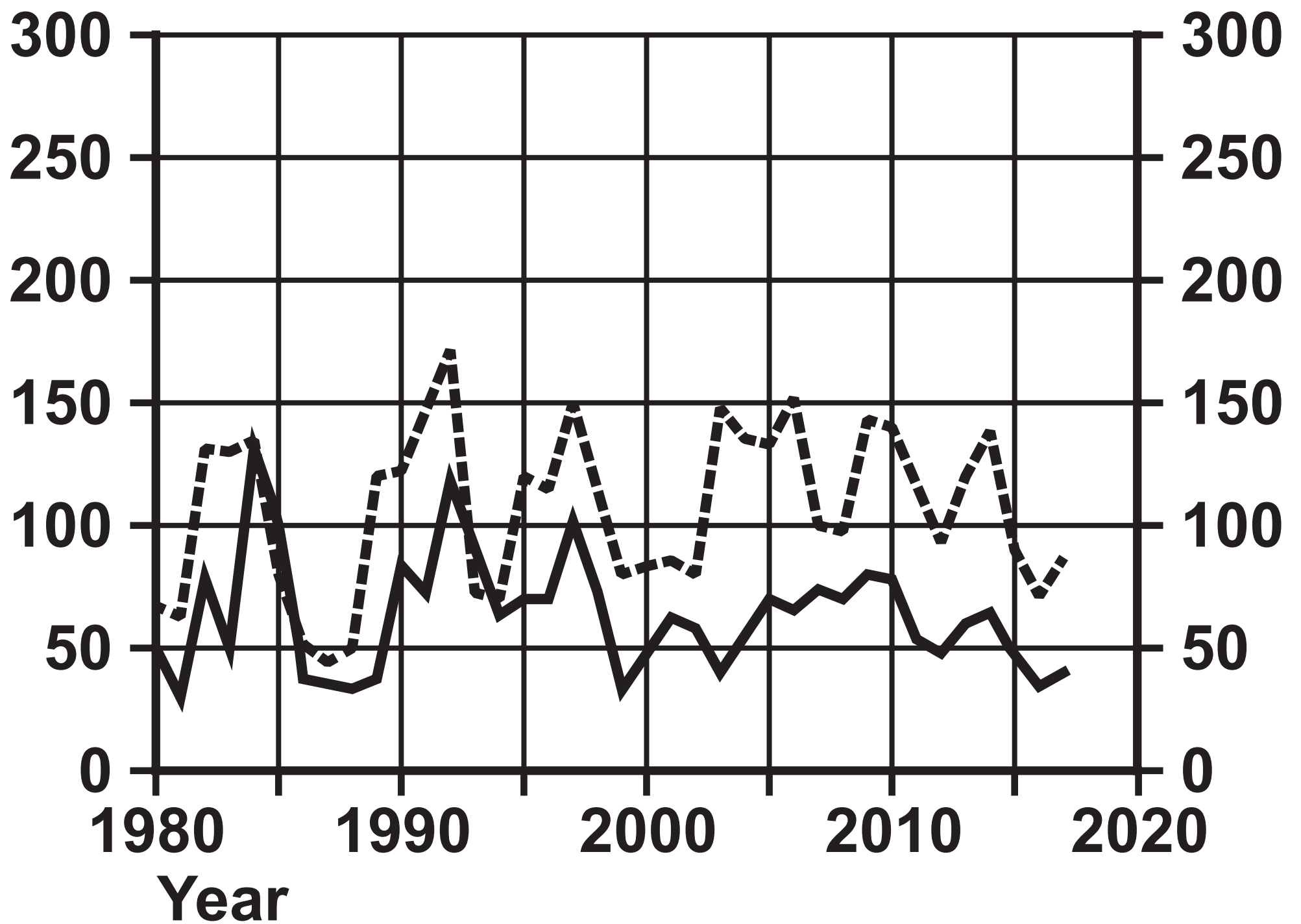
Question 10(b)

Key

----- Generalist species of butterfly

———— Specialist species of butterfly

Percentage of the 1979 value (%)



Question 10(c)

The black and white photograph shows a striped caterpillar eating a leaf of a similar size to the caterpillar.



Question 2(b)

Species	Number (n) in pond A	n(n-1) for pond A	Number (n) in pond B	n(n-1) for pond B
Azolla filiculoides	5	20	0	0
Lemna minuta	29	812	0	0
Lemna trisulca	50	2450	0	0
Alisma plantago-aquatica	2	2	0	0
Alopecurus aequalis	11	110	0	0
Carex pseudocyperus	2	2	0	0
Equisetum fluviatile	0	0	71	4970

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2(b) continued.

Species	Number (n) in pond A	n(n-1) for pond A	Number (n) in pond B	n(n-1) for pond B
Juncus effusus	0	0	60	3 540
Menyanthes trifoliata	16	240	0	0
Polygonum amphibium	0	0	25	600
Ranunculus circinatus	13		0	0
Sparganium erectum	3	6	0	0
Typha latifolia	5	20	0	0
Total			156	9 110

Question 9(a)(ii) – Blank

Question 4(a)

(Source: © Dimarion/Shutterstock)

Question 8

(Source: © Alberto Romeo)

Question 9(a)

(Source adapted from:

© Dimarion/Shutterstock)

(Source adapted from:

© Muskoka Stock Photos/Shutterstock)

Question 10(c)

(Source: © dossyl/Shutterstock)