



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2026

Biology

Sections A and B and Answerbook

Ordinary Level

Tuesday 9 June Afternoon 2:00 - 5:00

400 marks

Examination Number

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Date of Birth

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For example, 3rd February
2005 is entered as 03 02 05

Centre Stamp

Instructions

Write your Examination Number and your Date of Birth in the boxes on the front cover.

Write your answers to all parts of the examination into this answerbook. This answerbook will be scanned and your work will be presented to an examiner on screen. Anything that you write outside of the answer areas may not be seen by the examiner.

Write your answers in blue or black pen. You may use pencil for sketches, graphs and diagrams only.

There are three sections in this examination. Questions for Section **C** are supplied separately but your answers must be written in this answerbook.

It is recommended that you spend not more than 30 minutes on Section **A** and 30 minutes on Section **B**, leaving 120 minutes for Section **C**.

Section **A** Answer any **five** questions from this section.
Each question carries 20 marks.

Section **B** Answer any **two** questions from this section.
Each question carries 30 marks.

Section **C** Answer any **four** questions from this section.
Each question carries 60 marks.

Section A

Answer any five questions.

Write your answers in the spaces provided.

1. Answer the following parts (a) to (e):

- (a) Which **one** of the following biomolecules contains nitrogen?
Put a tick (✓) in the correct box.

Carbohydrate ☐

Protein ☐

- (b) Name a food that is a good source of carbohydrate in the diet.

- (c) Name a food that is a good source of fat in the diet.

- (d) Vitamins B and C are examples of water-soluble vitamins.
Give **one** example of a **fat**-soluble vitamin.

- (e) Zinc (Zn) is an example of a trace element required by organisms.
Name **another** trace element required by organisms.
Note: 'trace' refers to **very small** amounts.

2. Indicate whether the following statements are true or false by placing a tick (✓) in the appropriate box in **each** case.

Example:

Accidental discovery is a limitation of the scientific method.

True False

☒ ☐

(a) A hypothesis is always formulated at the end of an experiment.

☐ ☐

(b) 'Careful planning and design' is a principle of experimentation.

☐ ☐

(c) A control is used as a comparison to the test in an experiment.

☐ ☐

(d) Replicates are never required during experimentation.

☐ ☐

(e) A theory is a supported hypothesis.

☐ ☐

(f) Data generated from an experiment is always numerical.

☐ ☐

(g) A scientific journal is used to publish new research.

☐ ☐

3. Choose **each** term from the following list and place it in Column B to match a description in Column A. The first one has been completed as an example.

~~Haploid~~

Ribosome

Nucleus

Vacuole

Mitosis

Osmosis

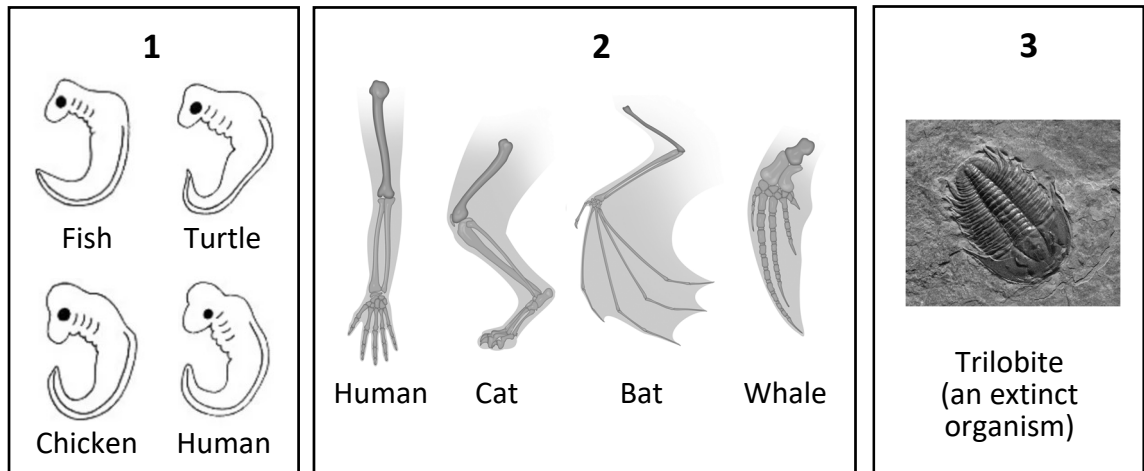
Column A	Column B
One set of chromosomes	Haploid
(a) An organelle that stores water in plant cells.	
(b) Controls the activities of a cell.	
(c) Movement of water molecules from a region of higher water concentration to a region of lower water concentration across a selectively permeable membrane.	
(d) Site of protein synthesis.	
(e) Nuclear division where two genetically identical nuclei are produced.	

4. The theory of natural selection was proposed by two biologists in the 19th century.

(a) Name **one** of these biologists.

--

(b) Three sources of evidence for evolution are shown below.
The diagrams (1 and 2) are not drawn to scale.



Name any **one** of these sources of evolution **or** any other **one** you have studied.

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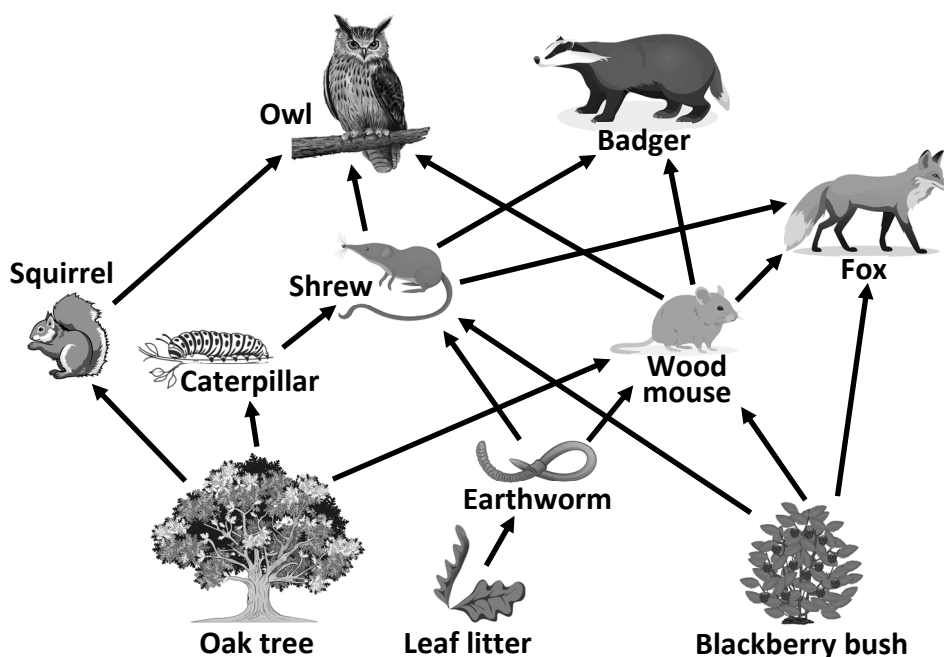
(c) Some key terms associated with the theory of natural selection are included below.
Comment on **each** of these terms in relation to observations made by the biologists who proposed the theory of natural selection.

(i) Rate of reproduction.

(ii) Adaptations of organisms.

(iii) Resources.

5. Study the food web shown and answer the questions **based on this food web only**.



- (a) Identify a producer in the food web above.

- (b) Identify a primary consumer from the food web above.

- (c) Name a carnivore in the food web above.

- (d) Write out **one** food chain from the food web above.

- (e) How many trophic (feeding) levels are in the food chain you wrote in part (d)?

- (f) Place a tick (✓) in the box which best represents the percentage energy loss between each trophic level in a food chain.

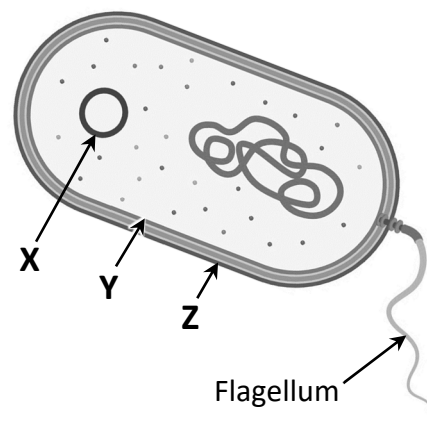
10%	
90%	

6. The diagram shows a bacterial cell.

- (a) Match the parts labelled **X**, **Y** and **Z** with the following terms:

Cell membrane, cell wall, plasmid

X:
Y:
Z:



- (b) Give the function of the flagellum.

- (c) State **one** factor which affects the growth of bacteria.

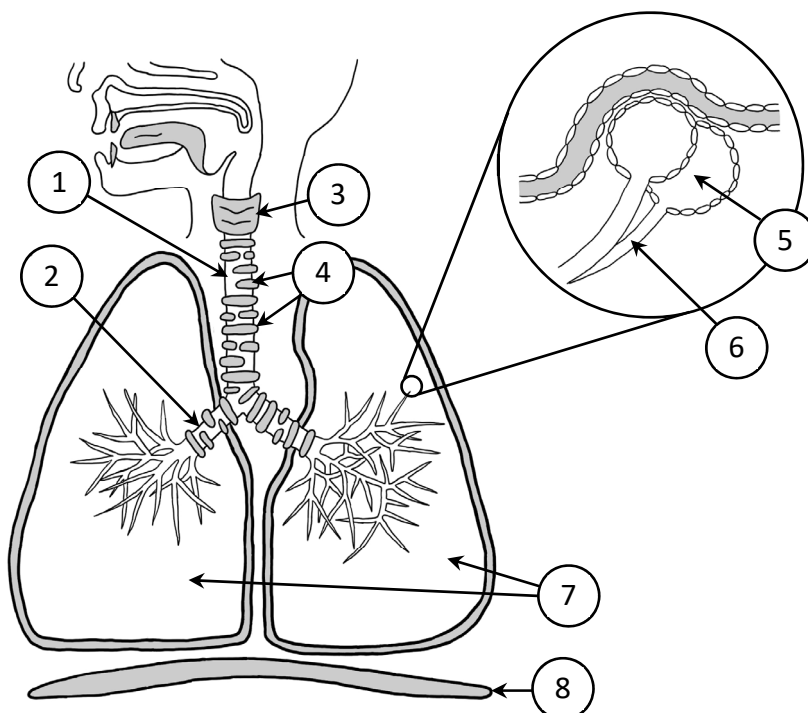
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- (d) Give **one** example of a harmful bacterium **and one** example of a beneficial bacterium.

Harmful:
Beneficial:

7. The diagram shows the human breathing system.

- (a) Complete the table below by writing **each** number (①, ②, ③, ④, ⑥, ⑦, ⑧) next to its corresponding named part.
One part (⑤) has been completed as an example.



Named part:	Number:
Alveolus	⑤
Diaphragm	
Lungs	
Bronchus	
Trachea (windpipe)	
Bronchiole	
Rings of cartilage	
Larynx (voice box)	

- (b) In which numbered part of the diagram does exchange of gases take place?

- (c) In the case of **one** of the following breathing disorders, **asthma** or **bronchitis**, state **one** possible cause **and one** possible treatment for the **named** disorder.

Named disorder:
Possible cause:
Possible treatment:

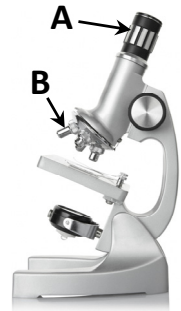
Section B

Answer any two questions.

Write your answers in the spaces provided.

Part (a) carries 6 marks and part (b) carries 24 marks in each question in this section.

8. (a) The light microscope, as shown in the image, magnifies specimens (e.g. cells) using parts **A** and **B**.



- (i) Name the part of the light microscope labelled **A**.

- (ii) If the specimen is magnified $\times 40$, and the power of **B** is $\times 4$, which of the following is the power of **A**?

Place a tick (✓) in the correct box. $\times 10$ ☐ $\times 40$ ☐

- (b) As part of your practical studies, you prepared plant cells and viewed them using a light microscope.

- (i) Name the type of plant cells you used.

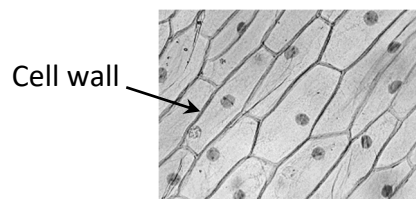
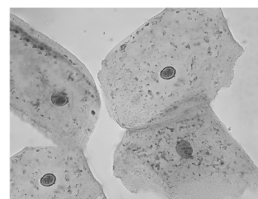
- (ii) Describe how you obtained the plant cells **and** how you prepared the unstained cells for viewing.

- (iii) You then prepared stained plant cells. Name a stain you applied to the cells.

- (iv) How did you apply the stain to the cells?

- (v) Why was a stain used in this activity?

- (vi) Which photograph below shows stained **plant** cells as seen using a light microscope? Place a tick (✓) in the correct box.


☐

☐

No cell wall

9. (a) Put a tick (✓) in the correct boxes for **each** of the following questions.
- (i) Which **one** of the following terms best describes the shape of enzymes?
Fibrous ☐ **Folded (globular)** ☐
- (ii) Which **one** of the following biomolecules makes up enzymes?
Protein ☐ **Lipid** ☐
- (b) Answer the following questions in relation to an investigation that you carried out to immobilise an enzyme **and** examine its application.

- (i) Name the enzyme you used.

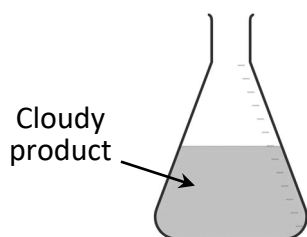
- (ii) Name a substance you used to immobilise the enzyme.

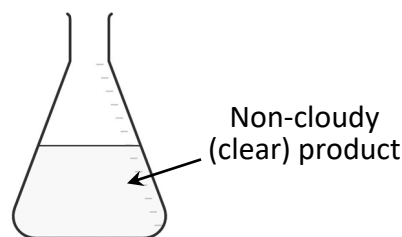
- (iii) In the space provided below, draw a labelled diagram of the apparatus (or equipment) you used to immobilise the enzyme.

- (iv) You would have also examined the application of the immobilised enzyme.
Name the **substrate** of the enzyme.

- (v) Name the **product** of the enzyme.

- (vi) In examining the application of the immobilised enzyme, a comparison between the products of immobilised and free enzyme was carried out.
Match the terms *immobilised enzyme* **and** *free enzyme* to the diagrams below based on the type of product they will most likely produce.





10. (a) (i) What is the function of the pacemaker in the heart?

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- (ii) Name a location in a plant where meristematic tissue can be found.

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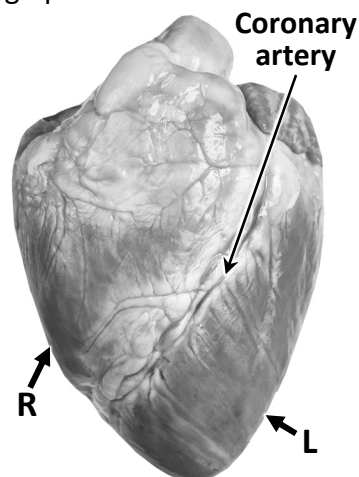
- (b) (i) The following questions relate to the dissection of an ox's or sheep's heart. The photograph shows a heart with its front side facing up.

1. Using a dotted line (.....), indicate **on the photograph** where an incision should be made.
2. What instrument would be suitable to make this incision?

--

3. Which letter on the photograph (**R or L**) indicates the side of the heart that has the **thickest** wall?

--



4. State a safety precaution that should be taken during this activity.

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- (ii) Answer the following questions in relation to the dissection of a dicotyledonous (dicot) stem.

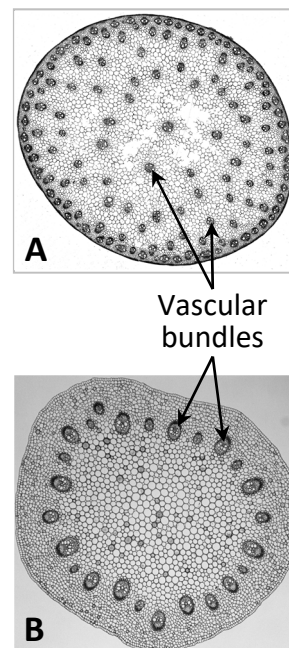
1. Which image (**A or B**) shows a dicot stem? Justify your answer.

Which?
Justify:

2. Name an instrument you used to prepare a thin section of the stem for microscopic examination.

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3. Explain why the section had to be thin.



Answerbook for Section C

Instructions

Questions for Section C are supplied separately.

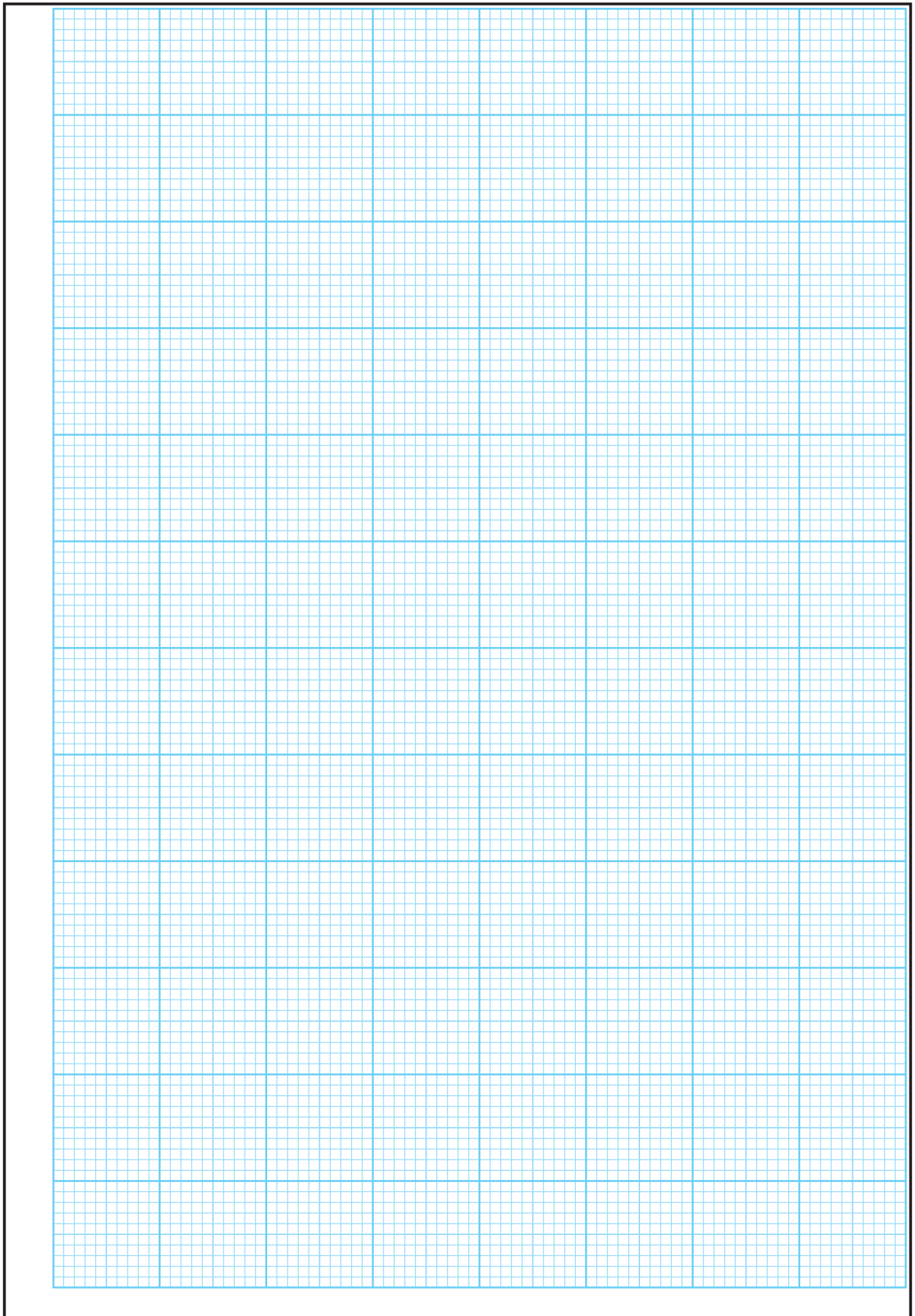
Start each question on a new page. Write the question number in the box at the top of each page. Use the left-hand column to label each part, as shown below.

Question		Start each question on a new page
Part	14	
(a)		
(b)(i)		
(b)(ii)		

There are two pages of graph paper on the next two pages of this answerbook. On pages with graph paper, the box for the question number is at the bottom of the page.

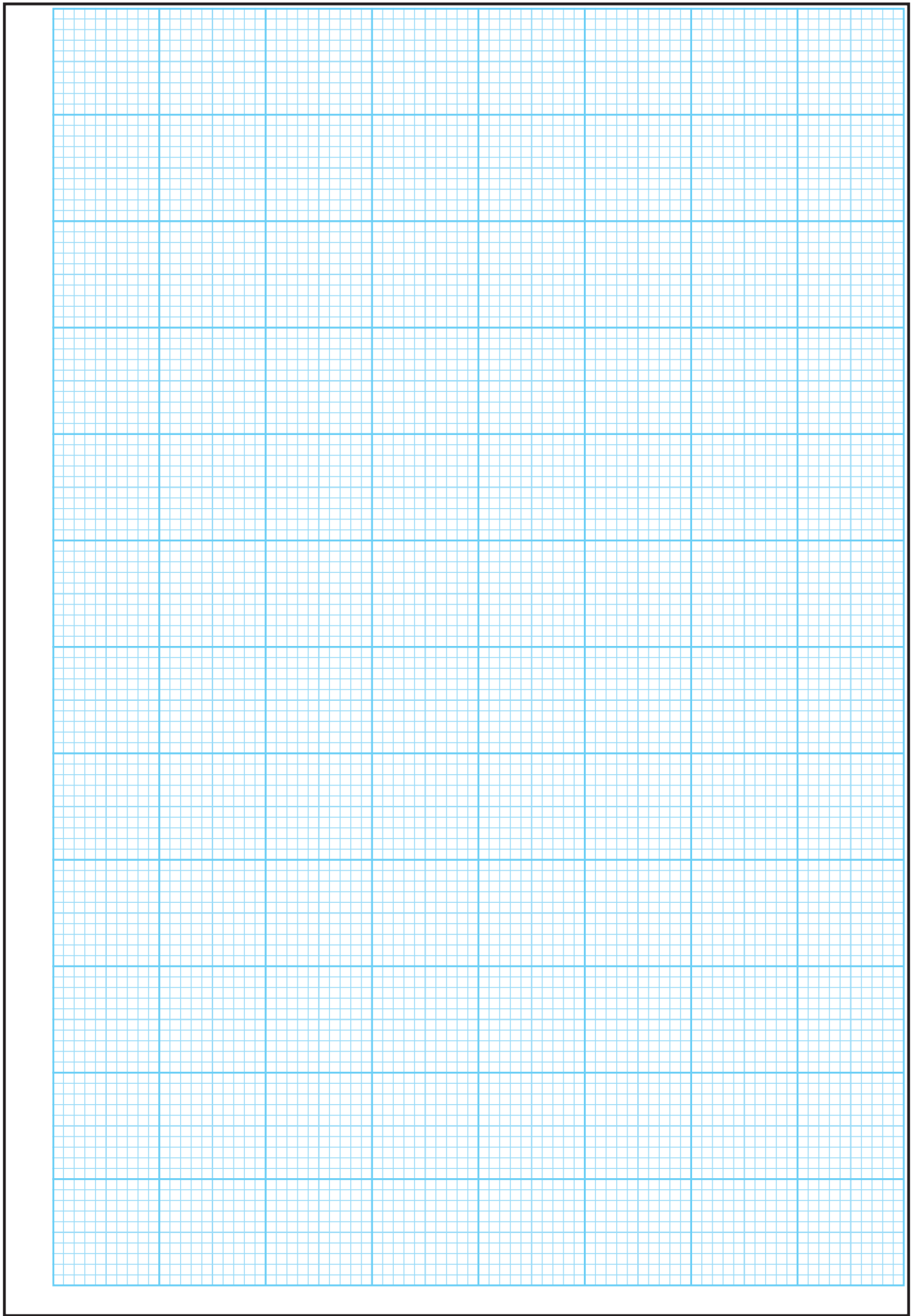
You do not need to use all of the pages in this answerbook. If you run out of space in this answerbook, you may ask the superintendent for more paper or graph paper.

Write your answers in blue or black pen. You may use pencil for sketches, graphs and diagrams only.



Question

☐☐



Question

☐☐

Part

[illegible]

Part

[illegible]

Part

[illegible]

Part

[illegible]

Part

[illegible]

Part

[illegible]

Part

[illegible]

A diagram showing a rectangle divided into two equal squares by a vertical line. The rectangle is labeled with 'a' on the top and bottom edges and 'b' on the left and right edges.

Part

[illegible]

Part

[illegible]

--	--

Part

[illegible]

Part

[illegible]

A diagram showing a large rectangle divided into four smaller squares by a horizontal and a vertical line. The top-left and top-right squares are empty, while the bottom-left and bottom-right squares contain a single dot each.

Part

[illegible]

--	--

Part

[illegible]

--	--

Part

[illegible]

--	--

Part

[illegible]

--	--

Part

[illegible]

Part

[illegible]

--	--

Part

[illegible]

--	--

Part

[illegible]

Part

[illegible]

Acknowledgements:

Images/diagrams:

Diagram 1 in Q4 (b) on page 5:

Bach H, Bernhardt D, Crome W *et al* (1967b) Entwicklung der Organismen. Lehrbuch der Biologie. Volk und Wissen, Berlin; page 27.

Diagram 2 in Q4 (b) on page 5:

shutterstock.com

Image of a trilobite in Q4 (b) on page 5:

James L. Amos, nationalgeographic.com

Diagram of an oak tree in Q5 on page 6:

dreamstime.com

Diagram of a caterpillar in Q5 on page 6:

dreamstime.com

Diagram of leaf litter in Q5 on page 6:

dreamstime.com

Diagram of a fox in Q5 on page 6:

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Diagram of a shrew in Q5 on page 6:

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Diagram of a wood mouse in Q5 on page 6:

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Diagram of a blackberry bush in Q5 on page 6:

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Diagram of an earthworm in Q5 on page 6:

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Diagram of an owl in Q5 on page 6:

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Diagram of a squirrel in Q5 on page 6:

dreamstime.com

Diagram in Q6 on page 7:

biorender.com

Diagram in Q7 (b) on page 8:

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Image in Q8 (a) on page 9:

alamy.com

Images in Q8 (b) on page 9:

microbehunter.com; shutterstock.com

Diagram in Q9 (b) on page 10:

biorender.com

Image in Q10 (b)(i) on page 11:

shutterstock.com

Image A in Q10 (b)(ii) on page 11:

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Image B in Q10 (b)(ii) on page 11:

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Tuesday 9 June

Afternoon 2:00 - 5:00