



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2023

Biology

Sections A and B and Answerbook

Ordinary Level

Tuesday 13 June Afternoon 2:00 - 5:00

400 marks

Examination Number

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------	----------------------	----------------------

Day and Month of Birth

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------

For example, 3rd February
is entered as 0302

Centre Stamp

Instructions

Write your Examination Number and your Day and Month 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) Give **one** source of carbohydrate in the diet.

(b) Name **one** element found in carbohydrates.

(c) Give **one** structural role of carbohydrates in living organisms.

(d) Two monosaccharides can join together to form a

(e) Name a polysaccharide found in plants.

2. Indicate whether the following statements are true or false by placing a tick (✓) in the appropriate box in **each** case. The first one has been completed as an example.

Example:

Biology is the study of life

True False

- | | | |
|--------------------------------------------------------------------|-------------------------------------|--------------------------|
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (a) A hypothesis is a possible explanation for an observation. | <input type="checkbox"/> | <input type="checkbox"/> |
| (b) A good experiment requires a small sample size. | <input type="checkbox"/> | <input type="checkbox"/> |
| (c) Data always involves numbers. | <input type="checkbox"/> | <input type="checkbox"/> |
| (d) Safety is an important principle of experimentation. | <input type="checkbox"/> | <input type="checkbox"/> |
| (e) Random selection is an important principle of experimentation. | <input type="checkbox"/> | <input type="checkbox"/> |
| (f) The scientific method has limitations. | <input type="checkbox"/> | <input type="checkbox"/> |
| (g) A theory is an unsupported hypothesis. | <input type="checkbox"/> | <input type="checkbox"/> |

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.

Hydrochloric acid Villi Liver Bile Egestion Peristalsis

Column A	Column B
Present in the stomach	Hydrochloric acid
(a) Contraction and relaxation of the muscles of the gut wall	
(b) Stored in the gall bladder	
(c) Increase surface area for absorption in the small intestine	
(d) Process by which food waste is passed from the body	
(e) Organ that breaks down alcohol	

4. An athlete obtains energy from glucose in aerobic respiration. The following word equation represents a summary of aerobic respiration.



- (a) Identify gases **X** and **Y**.

X:
Y:

- (b) Aerobic respiration consists of two stages (1 and 2). Describe the difference between the two stages in terms of the amount of energy released.

Stage 1:
Stage 2:

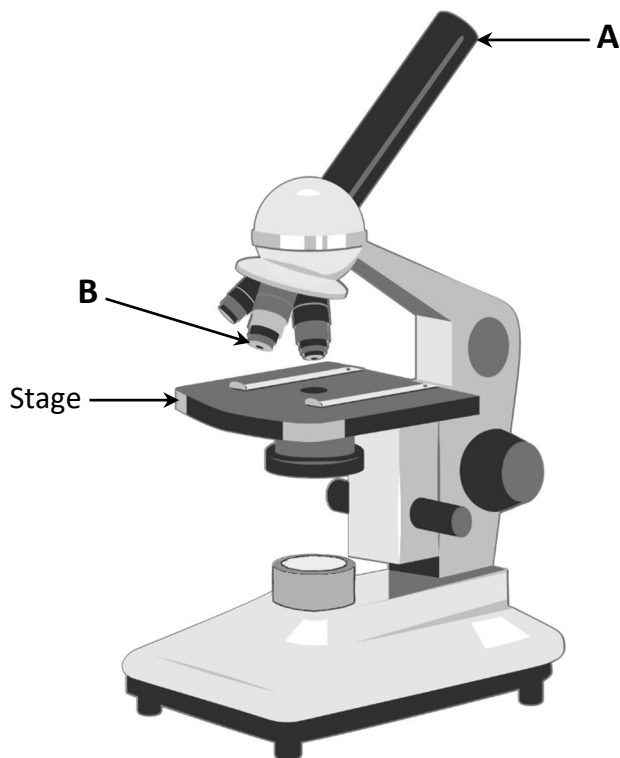
- (c) State **two** ways in which the released energy may be used in living organisms.

1.
2.

- (d) The athlete can also respire anaerobically if there is a lack of gas **X**. Name the product formed in the athlete's muscles as a result of anaerobic respiration.

--

5. The diagram shows a light microscope.



(a) Names the parts of the microscope labelled **A** and **B**.

A:
B:

(b) Using the letter '**X**', indicate **on the diagram above** the source of light.

(c) What is the function of the stage on the microscope?

--

(d) If the magnification of lens **A** is $\times 10$ and the magnification of lens **B** is $\times 40$, what is the total magnification?

--

(e) What is the function of a stain when using the light microscope?

--

(f) The light microscope is one type of microscope. Name another type of microscope.

--

6. The diagram represents a part of a DNA molecule. Complete the following in relation to DNA.

(a) How many strands make up a DNA molecule?

(b) Name any **two** nitrogenous bases found in DNA.

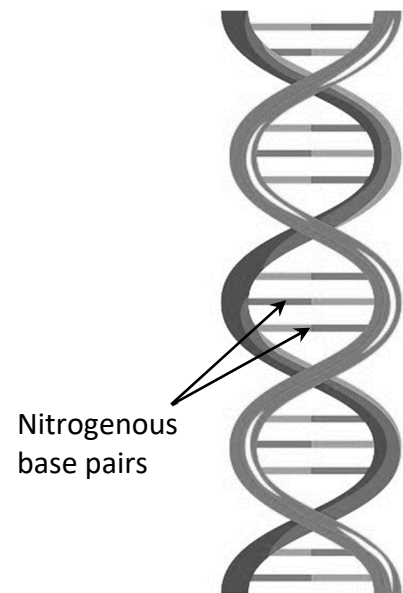
1.
2.

(c) Three bases together are known as a

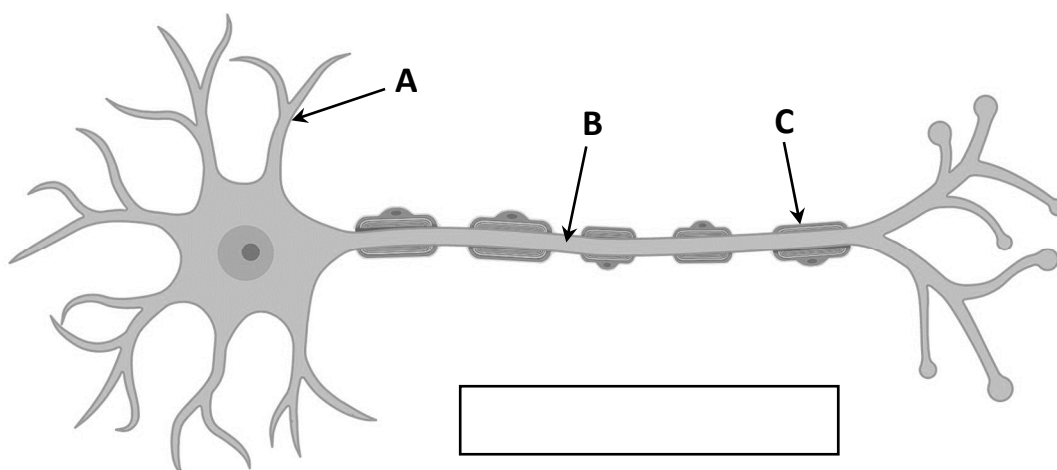
(d) Where in the human cell would you expect to find most DNA?

(e) DNA contains the instructions needed to make protein. This is called the code.

(f) Name a complementary structure to DNA that is involved in protein synthesis.



7. The diagram shows a neuron (nerve cell).



(a) Name the parts labelled **A**, **B** and **C**.

A:
B:
C:

(b) Give the function of the part labelled **A**.

--

(c) **In the box on the diagram above**, draw an arrow showing the direction the nerve impulse will travel in **this** neuron.

(d) Name the chemicals used to transmit nerve impulses from one neuron to another.

--

(e) Name any **one** disorder of the nervous system.

--

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) Describe the difference between the terms, *flora* and *fauna* by writing a note on **each**.

Flora:
Fauna:

- (b) The table shows the results of an ecological survey (percentage frequency) of dandelion and grass in a habitat. Answer the questions that follow based on this survey.

	Presence (✓) / absence (×)				
Dandelion	✓	×	✓	×	✓
Grass	✓	✓	✓	✓	✓

- (i) Describe how this survey may have been carried out.

- (ii) Calculate the percentage frequency of dandelion **and** grass in this habitat.

Dandelion:
Grass:

- (iii) **On the axes below**, sketch (using pencil) a bar chart to represent the percentage frequency of dandelion and grass. Label both axes.



10. (a) It is important to use sterile apparatus when working with micro-organisms.

(i) What is meant by the term *sterile*?

(ii) Give **one** method of sterilising apparatus.

(b) The following data table shows the difference in the growth of leaf yeast (number of colonies in malt agar) in the months of May and September.

	May	September
Number of colonies	5	14

(i) Name a suitable plant from which leaves can be obtained to carry out this investigation.

(ii) Name a suitable container that can be used to grow leaf yeast.

(iii) Suggest a reason for the presence of malt in the agar.

(iv) Describe how leaf yeast could be introduced into the malt agar.

(v) Describe a suitable control for this investigation.

(vi) What colour are leaf yeast colonies on malt agar?

(vii) Suggest a reason for the lower number of leaf yeast colonies present on leaves obtained from a plant in May versus September.

Answerbook for Section C

Instructions

Questions for Section C are supplied separately.

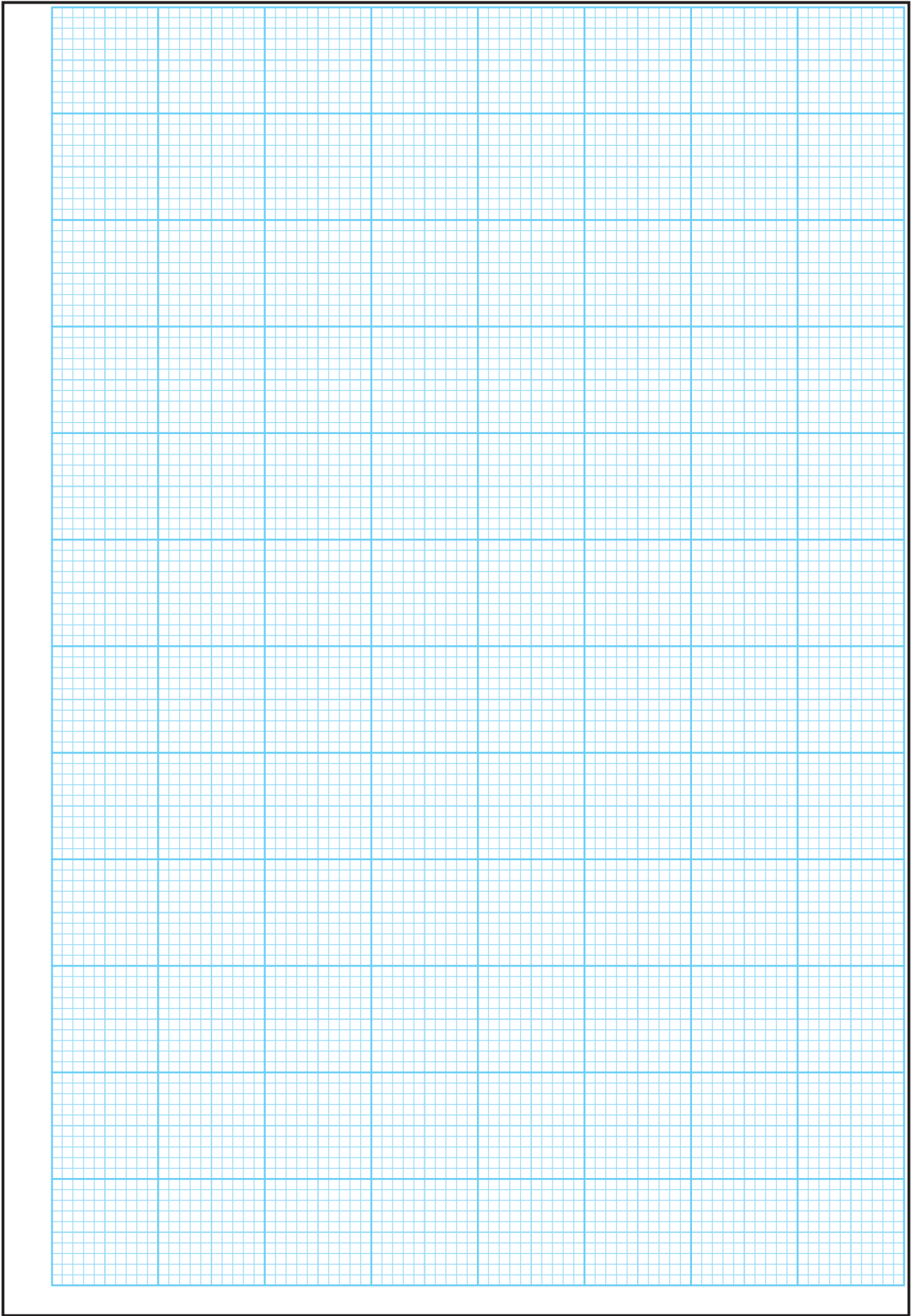
Start each question on a new page. Write the question number in the box at the top of each page. Use the left-hand column to label each part, as shown below.

	Question	<table border="1"><tr><td>1</td><td>4</td></tr></table>	1	4	Start each question on a new page
1	4				
Part					
(a)					
(b)(i)					
(b)(ii)					

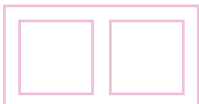
There are two pages of graph paper on the next two pages of this answerbook. On pages with graph paper, the box for the question number is at the bottom of the page.

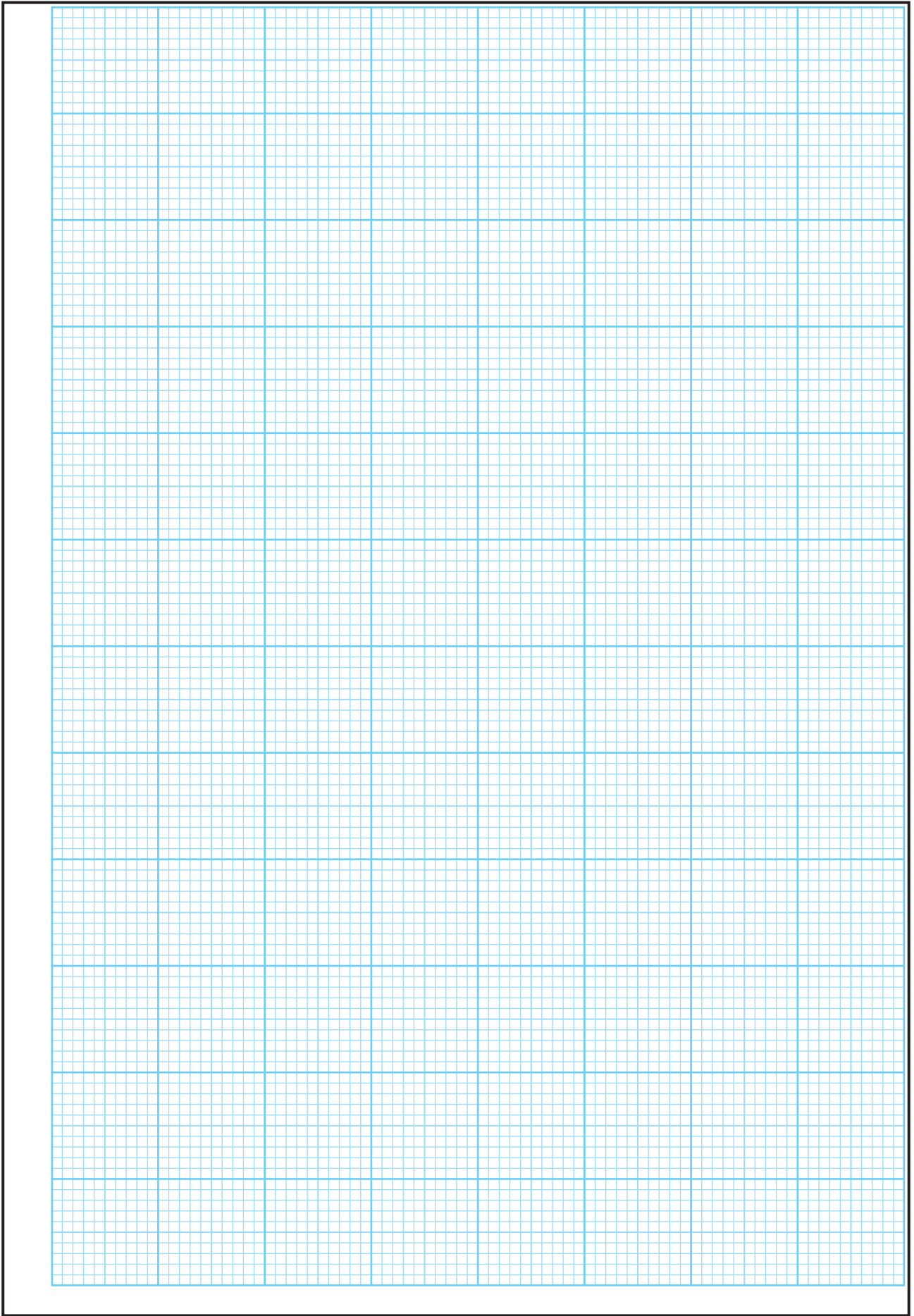
You do not need to use all of the pages in this answerbook. If you run out of space in this answerbook, you may ask the superintendent for more paper or graph paper.

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



Question





Question



Do not write on this page

Copyright notice

This examination paper may contain text or images for which the State Examinations Commission is not the copyright owner, and which may have been adapted, for the purpose of assessment, without the authors' prior consent. This examination paper has been prepared in accordance with *Section 53(5) of the Copyright and Related Rights Act, 2000*. Any subsequent use for a purpose other than the intended purpose is not authorised. The Commission does not accept liability for any infringement of third-party rights arising from unauthorised distribution or use of this examination paper.

Leaving Certificate – Ordinary Level

Biology Sections A and B and Answerbook

Tuesday 13 June

Afternoon 2:00 - 5:00