



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2021

Biology

Sections A and B and Answerbook

Ordinary Level

Tuesday 15 June Afternoon 2:00 – 5:00

290 marks

Examination Number

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Day and Month of Birth

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For example, 3rd February
is entered as 0302

Centre Stamp

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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 to 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 **four** questions from this section.
Each question carries 20 marks.

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

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

Section A

Answer any four questions.

Write your answers in the spaces provided.

1. Use your knowledge of nutrition to answer the following questions:

(a) Which food biomolecule contains glycerol?

(b) Name a reagent used to test for the presence of a reducing sugar.

(c) Identify **one** other element, contained in protein, in addition to C, H, O.

(d) Name **one** fibrous protein found in the body.

(e) Give **one** example of a water-soluble vitamin.

2. Answer the following in relation to tissues and organs.

(a) A tissue is a group of

(b) Name **one** animal tissue type and **one** plant tissue type.

1.	2.
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(c) An organ is a group of

(d) Name **one** animal organ and **one** plant organ.

1.	2.
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(e) What is tissue culture?

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

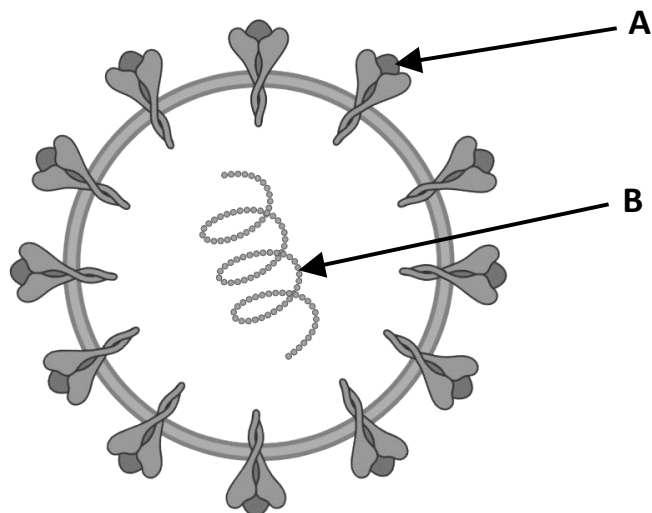
Rib cage Ureter Retina Bronchus Grey matter Villi

Column A	Column B
Skeleton	Rib cage
(a) Spinal cord	
(b) Eye	
(c) Lungs	
(d) Small intestine	
(e) Kidney	

4. In squirrels, the allele for black coat colour (B) is dominant to the allele for grey coat colour (b). A heterozygous black squirrel is crossed with a grey squirrel. Complete the blank spaces below to show the genotypes and phenotypes of the cross.

Genotypes of parents	Bb	x	bb
(a) Possible gametes			
(b) Genotype of offspring			
(c) Phenotype of offspring			

5. The diagram shows the structure of a virus such as COVID-19.



- (a) Why are viruses not considered to be living organisms?

- (b) Identify the **two** parts labelled **A** and **B** that are found in all viruses.

A.

B.

- (c) Describe **one** way viruses may be spread from person to person.

- (d) State **one** way the body can defend itself against viruses.

- (e) Give **one** way in which viruses are beneficial.

- (f) Explain why viruses are described as obligate parasites.

6. State whether each of the following statements is true or false by putting a (✓) in the appropriate box in **each** case.

Example:

A line transect shows changes along a gradient

True False

✓	
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(a) A pooter can be used to collect small insects from leaves.

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(b) A mammal trap is used to identify plants.

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(c) A cryptozoic trap can capture large animals.

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(d) A pitfall trap is used to capture insects in flight.

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(e) A net is used to capture small organisms from tall grass or water.

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(f) A Tullgren funnel is used to extract small organisms from leaf litter.

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(g) Abiotic factors are living factors that affect organisms.

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7. The diagram shows the structure of a human skeleton.

(a) What type of joint is found in the skull?

(b) Place an **X** on the diagram in a position to show a free moving or synovial joint.

(c) Name the type of synovial joint you have labelled **X** on the diagram.

(d) Place an **F** on the diagram to show the femur.

(e) Give any **one** function of the skeleton.

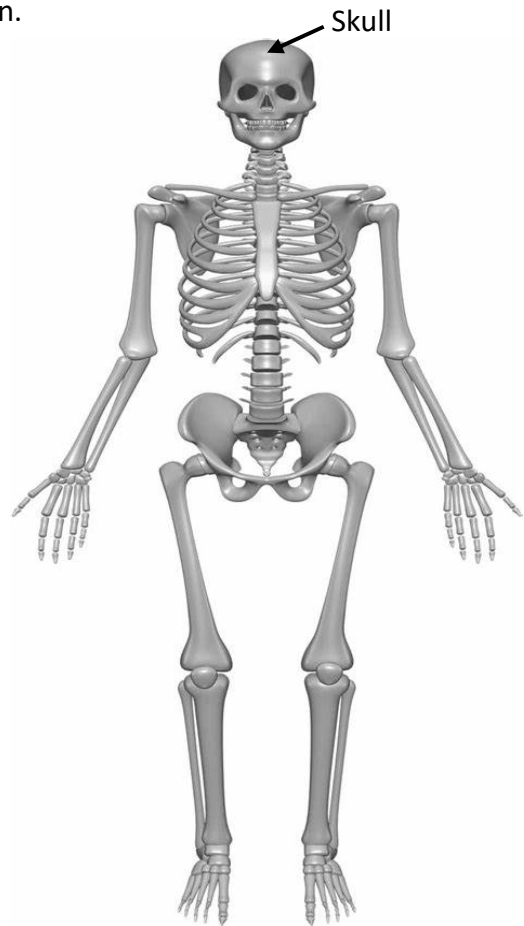
(f) Arthritis and osteoporosis are two disorders of the musculoskeletal system.

Answer the following in relation to **either** of the above disorders.

Name of disorder:

(i) **One** possible cause of the named disorder.

(ii) **One** treatment for the named disorder.



Section B

Answer any one question.

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) (i) Identify with a label **X**, the eyepiece on the diagram of the light microscope.
- (ii) Identify with a label **Y**, the stage or platform on the diagram of the light microscope.
- (b) Answer the following questions in relation to the preparation and examination of a stained and unstained plant cell using a light microscope.

- (i) Name a plant you used to obtain the sample of cells.

- (ii) How did you prepare an unstained plant cell sample for examination under the light microscope?

- (iii) What stain did you add to the cells?

- (iv) What was the purpose of the stain?

- (v) How did the objective lens help you to see your stained cell sample?

- (vi) Give **one** cell structure that showed you were looking at plant cells.



9. (a) Enzymes play an important role in the body's metabolism.

(i) What is an enzyme?

(ii) Explain the underlined word.

(b) Answer the following in relation to an investigation you carried out into the effect of pH on the rate of enzyme activity.

(i) Name the enzyme you used in the investigation.

(ii) Name the substrate for the enzyme named at part (i) above.

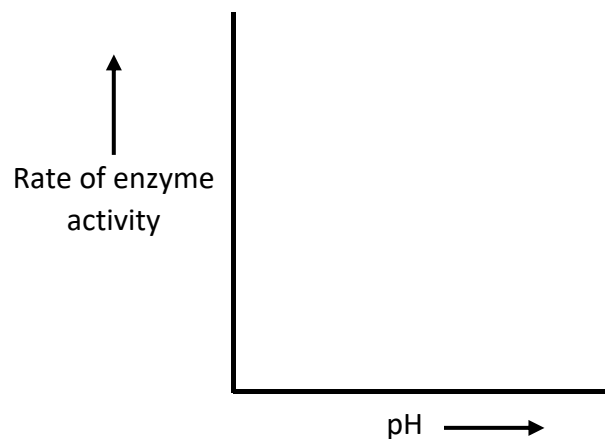
(iii) How did you vary the pH?

(iv) Name the factor that you kept constant.

(v) How was this factor kept constant?

(vi) How did you measure the rate of enzyme activity?

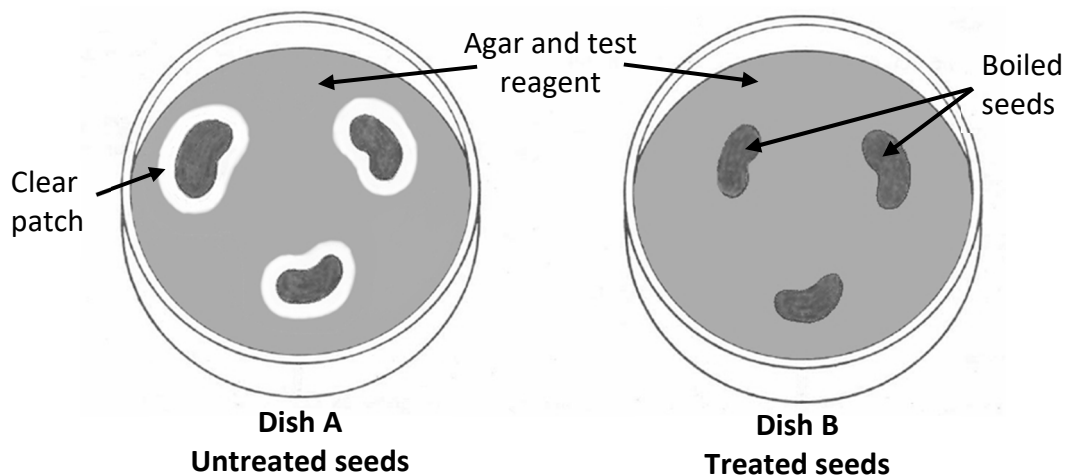
(vii) Sketch a graph to show the results of your investigation using the axis provided.



10. (a) (i) What is digestion?

- (ii) Name the product of starch digestion in plants.

- (b) The diagram shows the results of an investigation into the digestive activity of germinating seeds.



- (i) Name a seed you could use in the investigation.

- (ii) Name a type of agar you could use in this investigation.

- (iii) Describe **one** step taken to minimise contamination during the investigation.

- (iv) Why are there multiple seeds used in each dish?

- (v) What test reagent or chemical was added to determine if digestive activity had occurred?

- (vi) Why are there no clear patches in dish B?

- (vii) What is the purpose of a control in a scientific investigation?

Answerbook for Section C

Instructions

Questions for Section C are supplied separately.

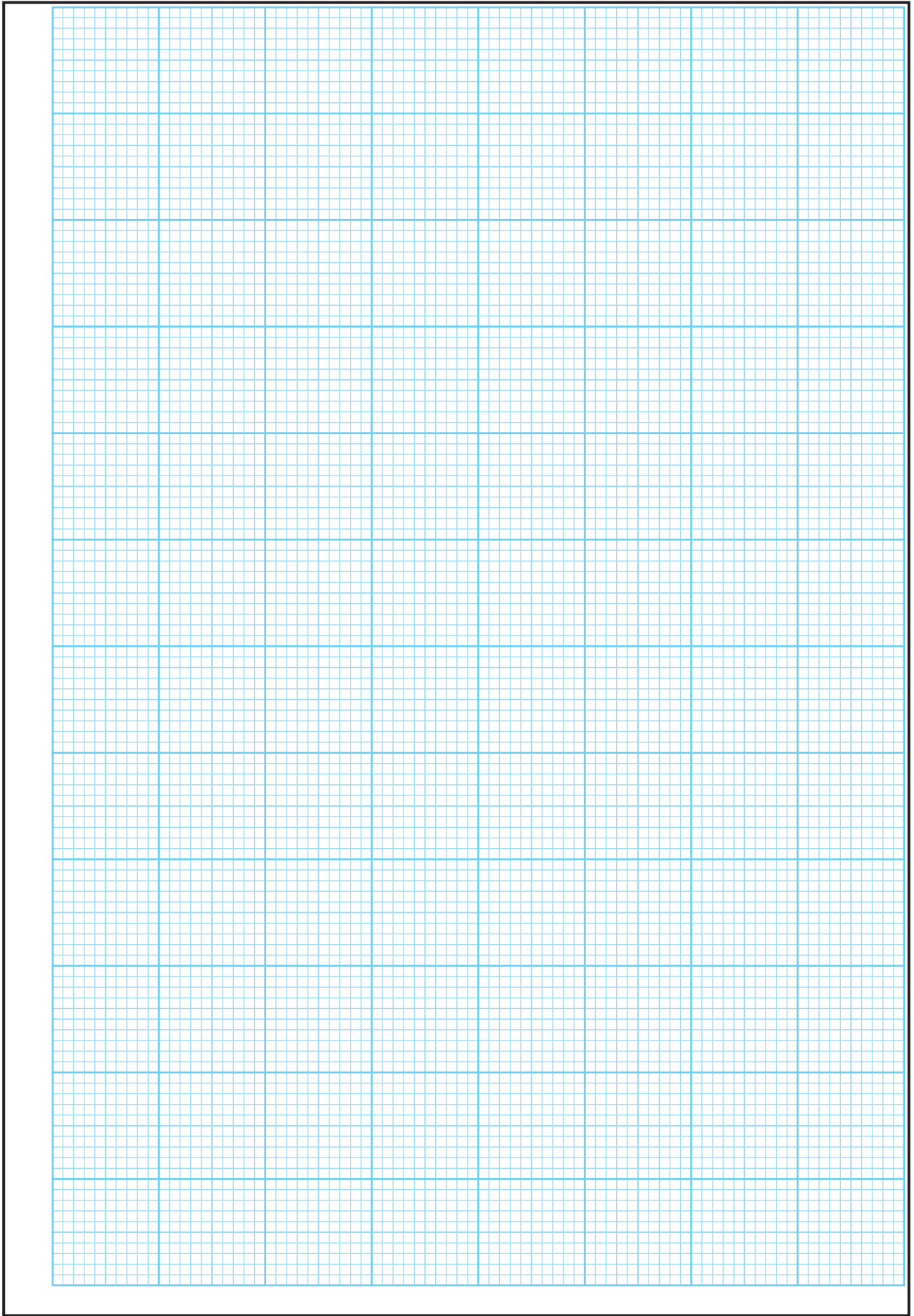
Start each question on a new page. Write the question number in the box at the top of each page. Use the left-hand column to label each part, as shown below.

Part <i>Cuid</i>	Question <i>Ceist</i>	04	Start each question on a new page <i>Cuir tús le gach ceist ar leathanach nua</i>
(a)			
(b)(i)			
(b)(ii)			

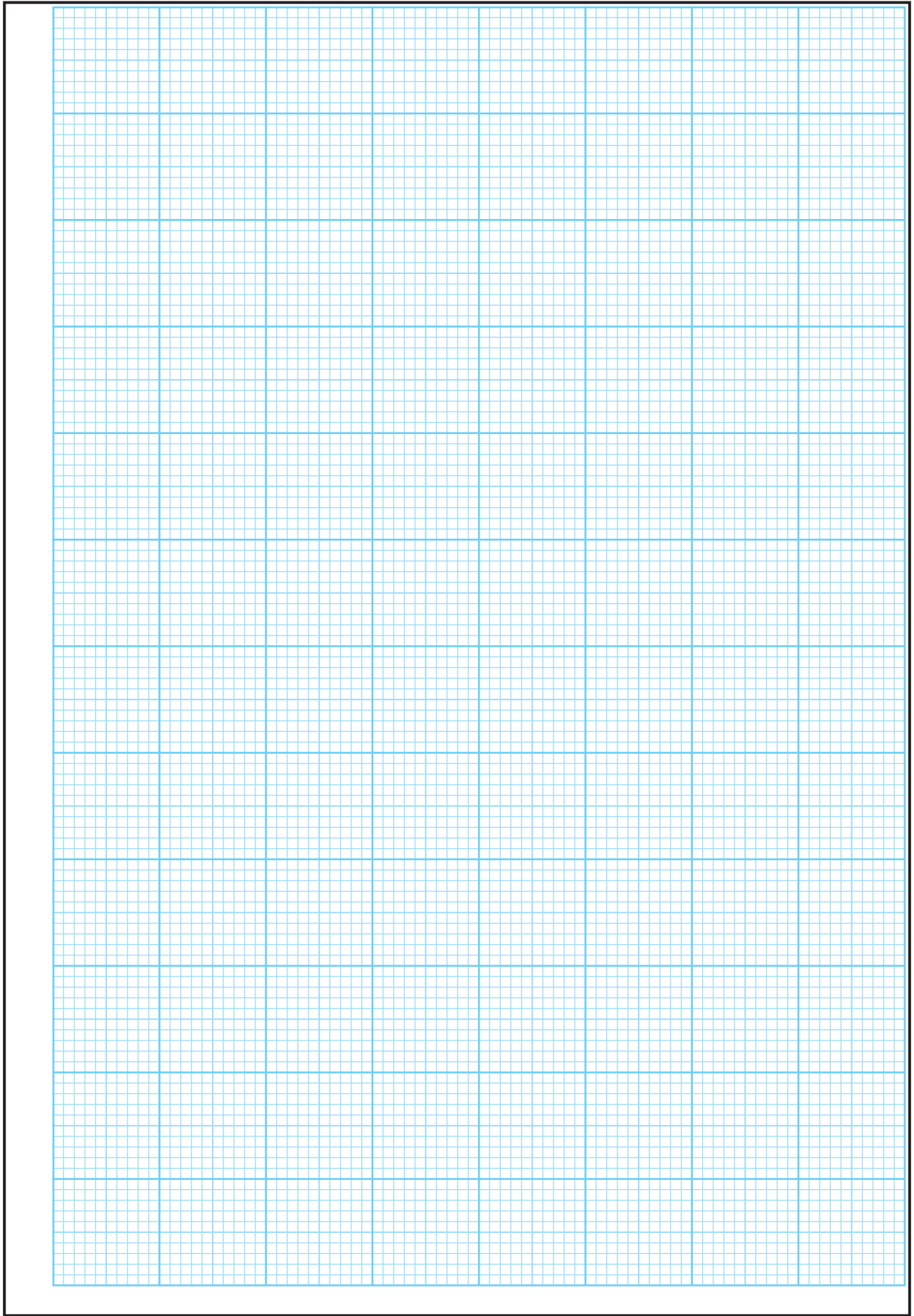
There are four pages of graph paper on the next four pages of this answerbook. On pages with graph paper, the box for the question number is at the bottom of the page.

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.

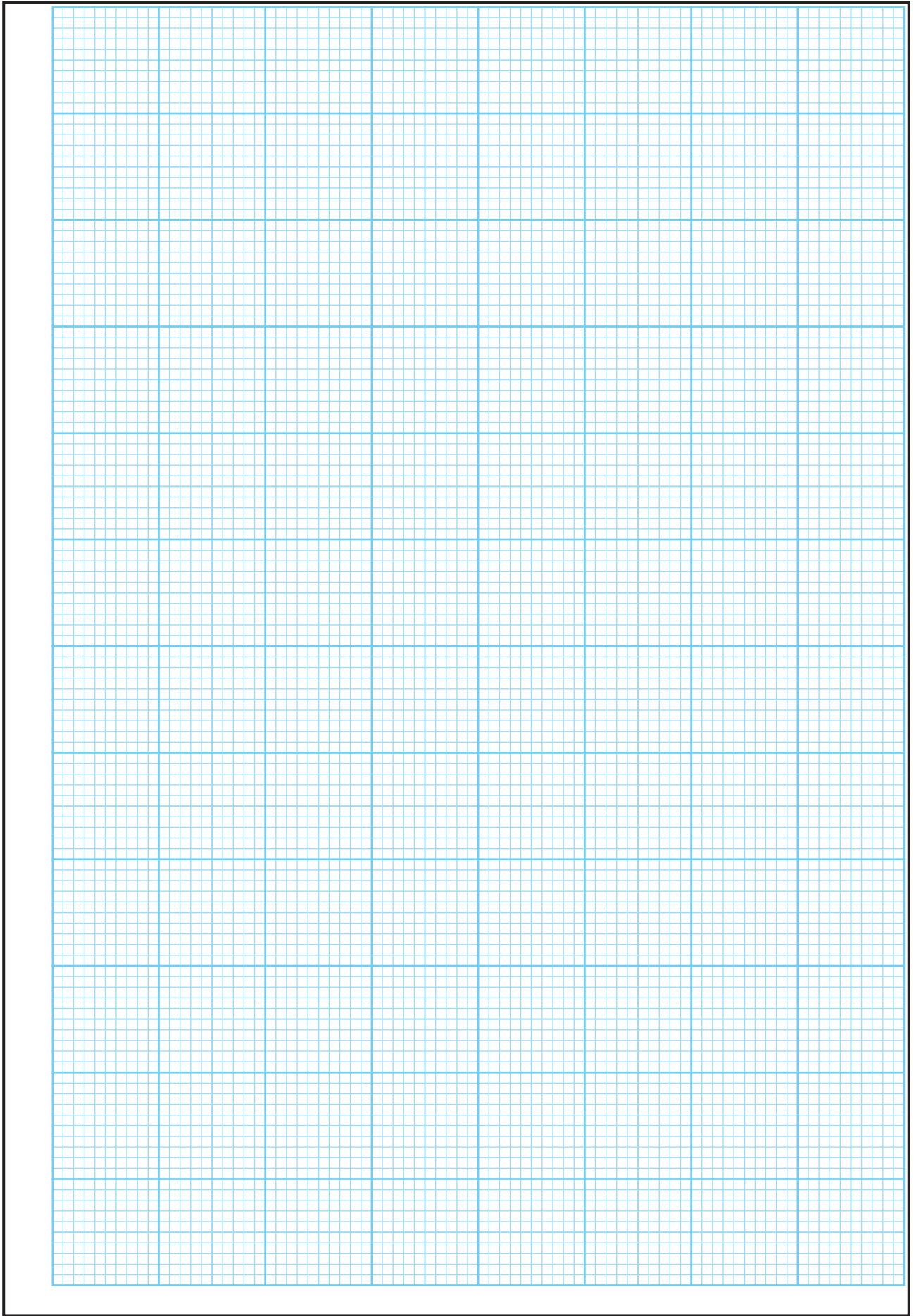
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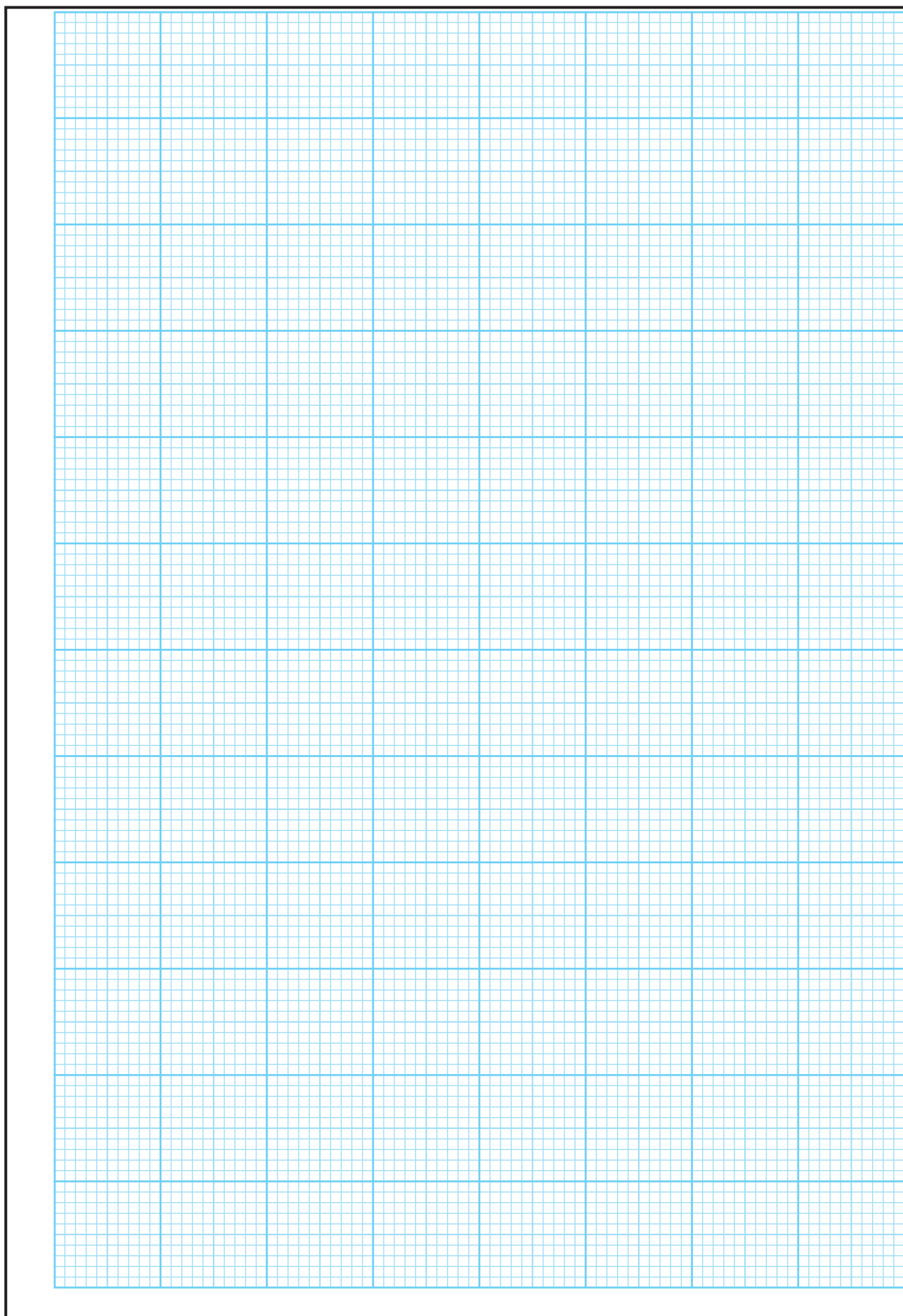
Question



Question



Question



Question

Part

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