2020.M44

2020L025A1EL

Coimisiún na Scrúduithe Stáit
State Examinations Commission

# Leaving Certificate Examination 2020

# Biology

## Sections A and B and Answerbook

## Higher Level

## Three hours

400 marks

**Examination Number**

**Day and Month of Birth**

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 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**.

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| Section **A** | Answer any **five** questions from this section.<br>Each question carries 20 marks. |
| Section **B** | Answer any **two** questions from this section.<br>Each question carries 30 marks. |
| Section **C** | Answer any **four** questions from this section.<br>Each question carries 60 marks. |

# Section A

**Answer any five questions.**
**Write your answers in the spaces provided.**

**1.** Answer any **five** of the following parts (a) to (f):

(a) Give **one** example of a trace element in the human diet.

(b) Name the **three** chemical elements found in all lipids.

(c) Name the basic unit that makes up lipids.

(d) Respiration is an example of a metabolic pathway in organisms. What type of metabolic pathway is in question?

(e) What is meant by the term *polysaccharide*?

(f) Name a storage polysaccharide found in animals.

**2.** Answer this question in relation to the principles of experimentation.

A scientist carried out a trial, to investigate the effect of herbal (plant) extract on the rate of recovery from the common cold.
Ten friends suffering from the common cold were chosen to participate in the trial. These were divided into two groups of five. Everyone in group A was given a glass of herbal extract to drink and everyone in group B given a glass of water to drink. Their rate of recovery was monitored over a 24 hour period.

(a) What is the purpose of carrying out an experiment?

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(b) Why is a control normally used when carrying out an experiment?

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(c) Which group was the control group?

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(d) Give **two** reasons why the method of selecting the participants reduces the reliability of the results.

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(e) Using examples from the text, other than the selection of participants, give **two** ways to show how the experimental design could be improved.

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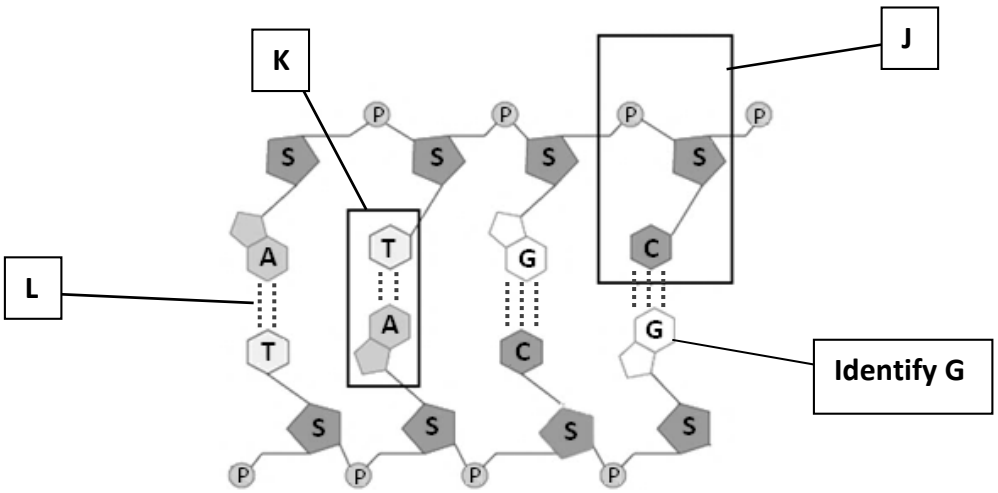
**3.** Indicate whether the following statements are true or false by placing a tick (✓) in the appropriate box in **each** case.

| | | True | False |
|---|---|---|---|
| (a) | Spindle fibres contract during metaphase of mitosis. | | |
| (b) | Glucose is produced by yeast cells during fermentation. | | |
| (c) | The process of translation results in a protein being made. | | |
| (d) | Prokaryotic cells contain a nucleus. | | |
| (e) | Darwin and Wallace proposed the Theory of Natural Selection. | | |
| (f) | A mutation to a cell's DNA always has a negative impact for the cell. | | |
| (g) | The ribosome of the cell contains the chromosomes. | | |

**4.** The diagram shows part of the structure of DNA.




(a) What do the letters DNA stand for?

(b) Identify molecule **G**.

(c) The structure labelled **J** is a sub-unit of DNA. Identify the structure labelled **J**.

(d) Name the part labelled **K**.

(e) What type of bonding occurs at **L**?

(f) State **one** structural difference between DNA and RNA, other than the number of strands.

(g) Give **one** non-nuclear location of DNA in cells.

**5**. Give **one** function of each of the following structures in the human body:

(a) Cones in the eye.

(b) The optic nerve.

(c) Iris in the eye.

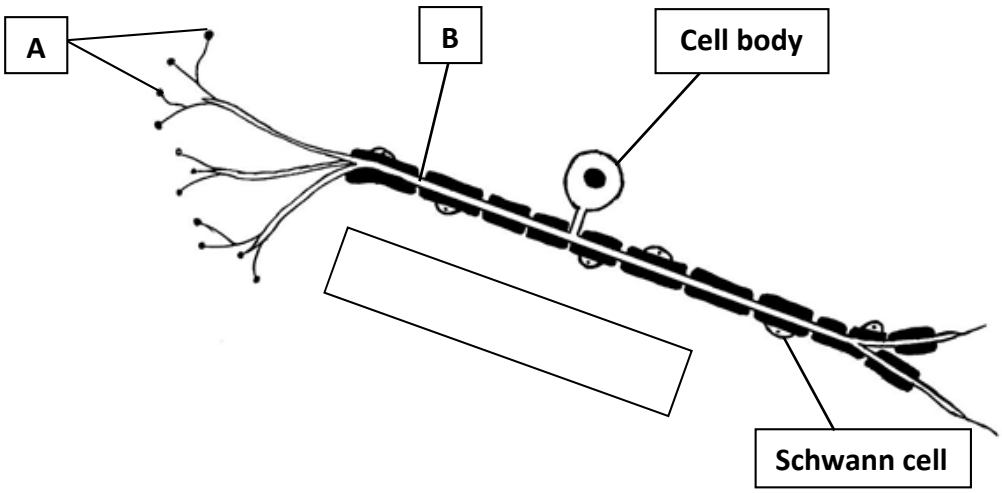
(d) The Eustachian tube in the ear.

(e) The semi-circular canals in the ear.

(f) Ligaments in joints.

(g) Cartilage around the ends of bones.

**6.** The diagram shows the structure of a sensory neuron in the human body.




(a) Identify the part of the neuron labelled **B**.

(b) Name the substance (or group of substances) released by **A** during a nerve impulse.

(c) Name the substance produced by the Schwann cell.

(d) What is the function of this substance named at (c) during a nerve impulse?

(e) **Draw an arrow**, in the box provided near the diagram, to show the direction of the impulse.

(f) Parkinson's disease and paralysis are two disorders of the human nervous system. Choose either Parkinson's disease **or** paralysis and suggest how it may be caused and treated.

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| Disorder: |
| Cause: |
| 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.**

**7.** (a) (i) What is an immobilised enzyme?

(ii) Give **one** advantage of using immobilised enzymes.

(b) Answer the following questions in relation to an investigation that you carried out to immobilise an enzyme or cell and examine its application.

Name the enzyme or cell that you used.

(i) Describe how you immobilised that enzyme or cell.

(ii) Outline how you used the immobilised enzyme or cell to examine its application.

**8.** (a) (i) What is meant by the term *germination*?

(ii) State **three** factors necessary for successful germination.

(b) Answer the following questions in relation to an investigation you carried out to show digestive activity during seed germination.

State whether your used starch agar or skimmed milk (protein) agar.

(i) Why were the seeds soaked in water prior to the investigation?

(ii) Describe how you further prepared the seeds and added them to the agar plate(s).

(iii) Under what conditions did you store the plate(s) containing the seeds to allow germination to occur?

(iv) How did you test to show that digestion had occurred?

(v) State the result that showed digestion had occurred.

**9.** (a) (i) Why is the blood in the right side of the heart kept separate from the blood in the left?

(ii) In relation to the heartbeat, what is meant by the term *diastole*?

(b) Answer the following in relation to an investigation you carried out to dissect, display and identify the parts of a sheep's or an ox's heart.

(i) How did you identify the right hand side from the left hand side of the heart?

(ii) On which surface of the heart did you observe the coronary artery (groove)?

(iii) Describe how you dissected the heart to identify the bicuspid valve.

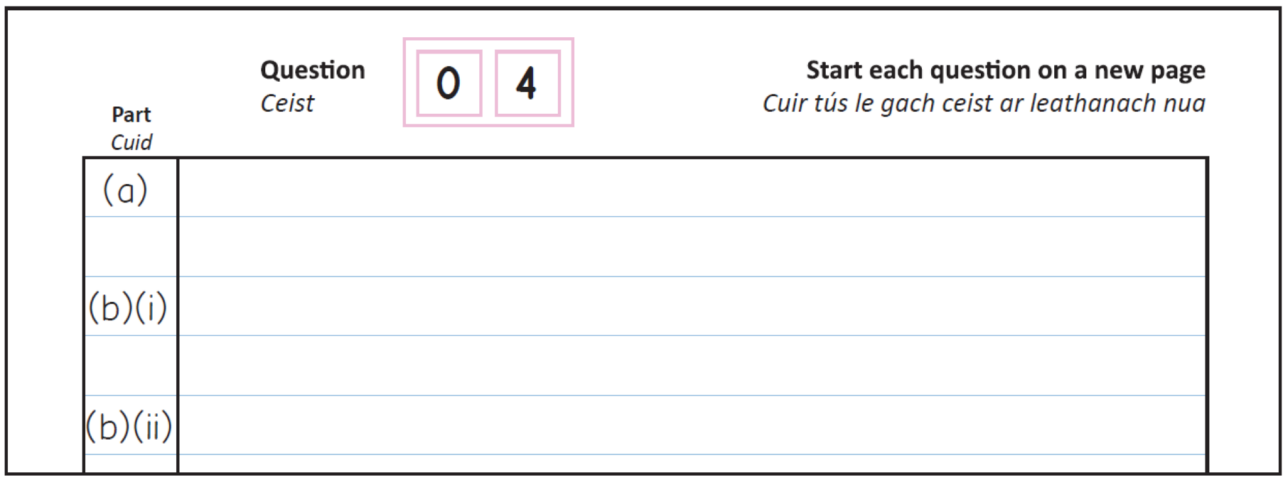
(iv) State the precise location of **one** semilunar valve **and** describe how you further dissected the heart to locate this valve.

# 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.




Four pages of graph paper are provided at the back 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.

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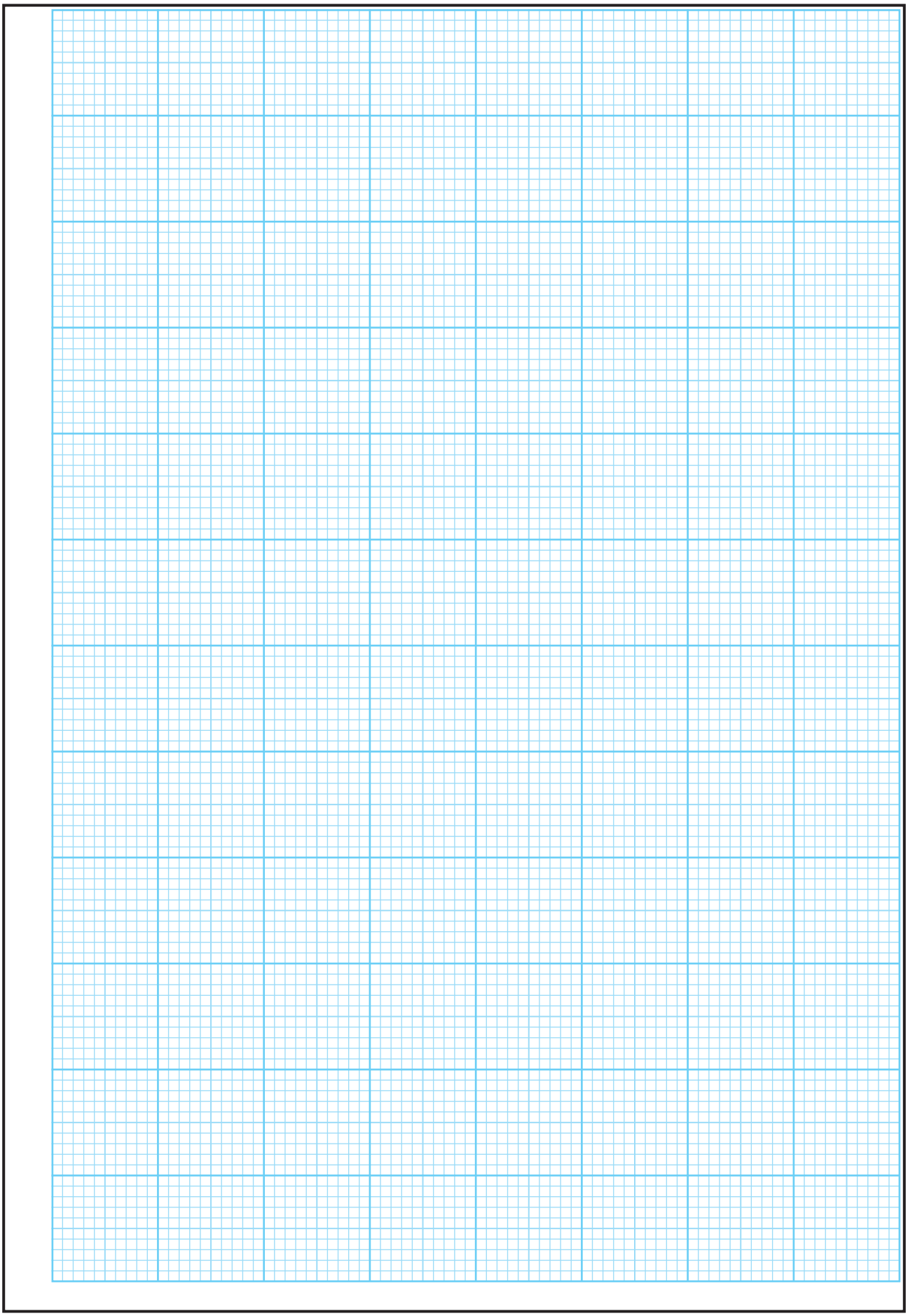

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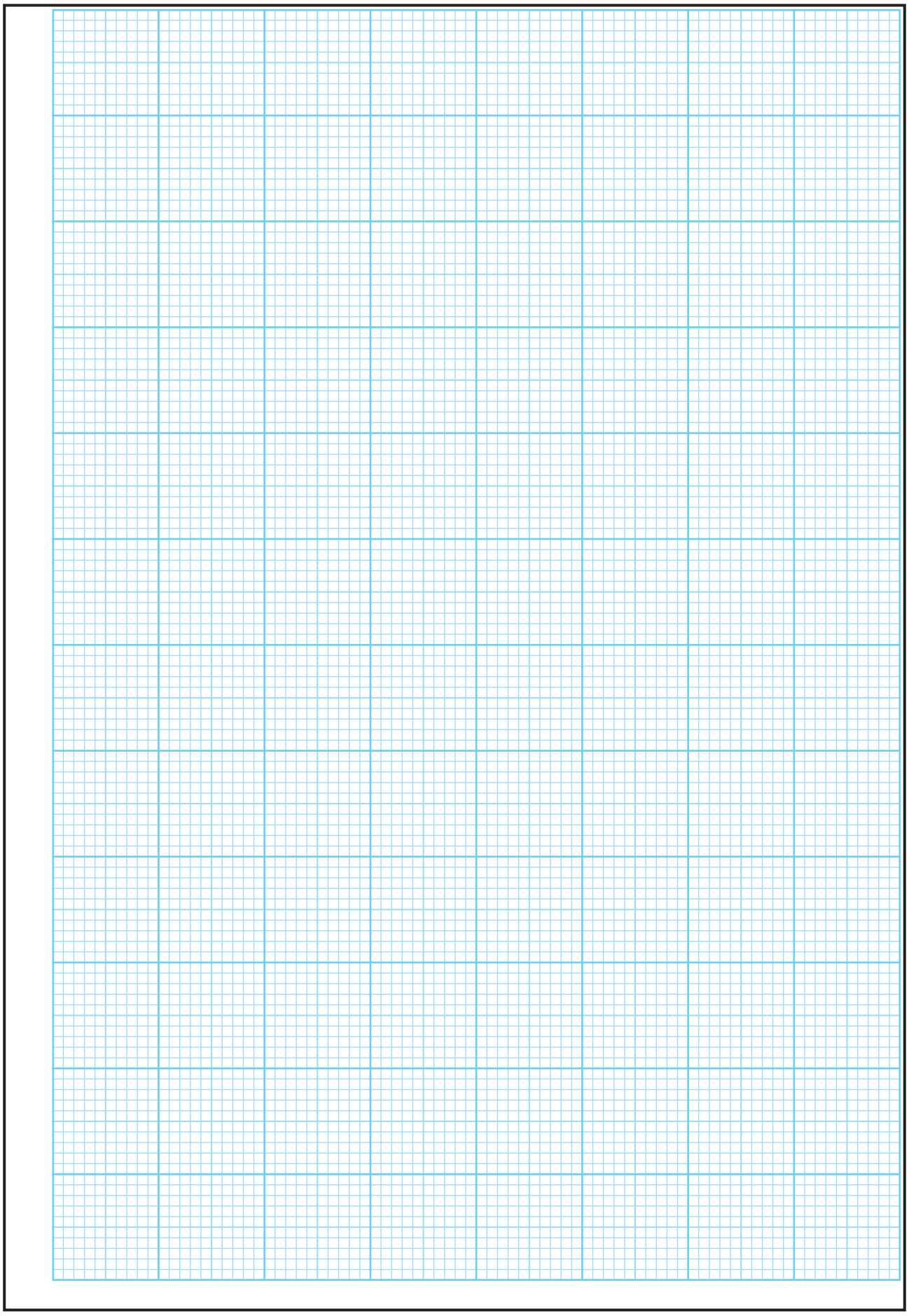

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Leaving Certificate – Higher Level

# Biology Sections A and B and Answerbook

Three hours