2024.M44K
(deferred examination)

2024L025A1EK

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2024

Biology

Sections A and B and Answerbook

Higher Level

3 hours

400 marks

Examination Number

Date of Birth

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

(a) Name the **three** chemical elements found in carbohydrates.

(b) Write down the general formula for carbohydrates.

(c) Write down any **three** elements present in foods as dissolved salts.

(d) Write down any **three** elements present in foods in trace amounts.

(e) Name **one** water-soluble vitamin.

(f) Name **one** fat-soluble vitamin.

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

		True	False
(a)	Interphase is the shortest stage of the cell cycle.	☐	☐
(b)	The yellow marrow in bone stores fats.	☐	☐
(c)	Contest competition ensures all get some of the resource.	☐	☐
(d)	*Amoeba* belongs to the Kingdom Protista.	☐	☐
(e)	Variation can result from mutation.	☐	☐
(f)	The morula forms before the blastocyst in human reproduction.	☐	☐
(g)	Response is a characteristic of life.	☐	☐

3. Enzymes are biological catalysts involved in metabolism. Enzyme structure is often represented using ribbon diagrams. The picture shows a ribbon diagram representing a common human enzyme.

(a) To which group of biomolecules do enzymes belong?

(b) Give **one** example of an enzyme.

(c) Enzymes such as the one shown in the picture have a folded shape and an active site.
What is the function of the active site of an enzyme?

(d) Enzymes show <u>specificity</u>. Explain the underlined term.

(e) Give **two** factors that affect the function of an enzyme.

1.

2.

(f) What is a denatured enzyme?

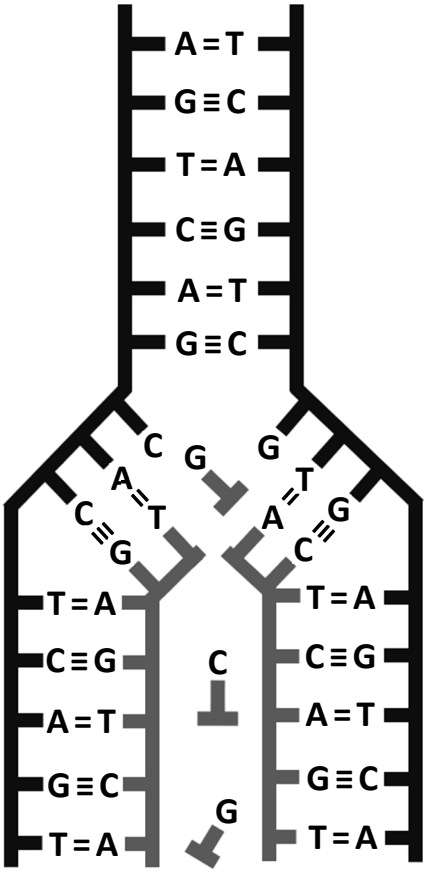
4. The diagram shows a piece of DNA undergoing replication.

(a) What name is given to the shape of a DNA molecule?

(b) Most DNA in a eukaryotic cell is found in the nucleus.
Name another cell organelle in which DNA is found.

(c) DNA is composed of nucleotides with purine and pyrimidine nitrogenous bases.
Name the **two** purine nitrogenous bases present in DNA.

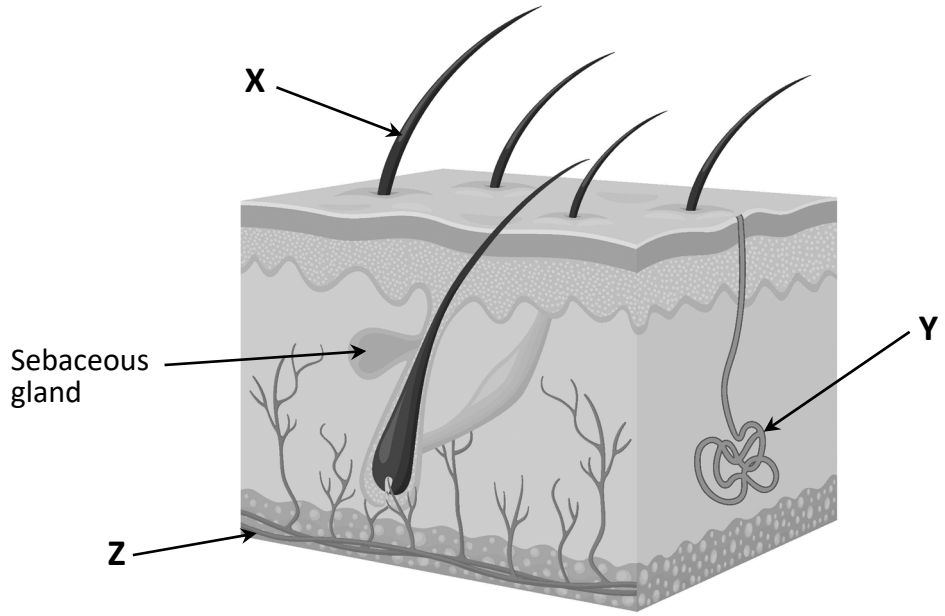
1.
2.



(d) The nitrogenous bases are paired together as complementary base pairs.
Explain how complementary base pairs are held together.

(e) DNA replication is an important biological process.
Briefly describe **two** events shown in the diagram above that show this piece of DNA is undergoing replication.

5. The diagram shows a vertical section of human skin.



(a) The parts labelled **X**, **Y** and **Z** are all involved in temperature regulation.

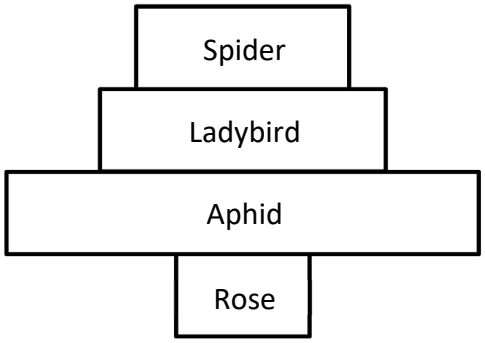
(i) Name parts **X**, **Y** and **Z**.

X:
Y:
Z:

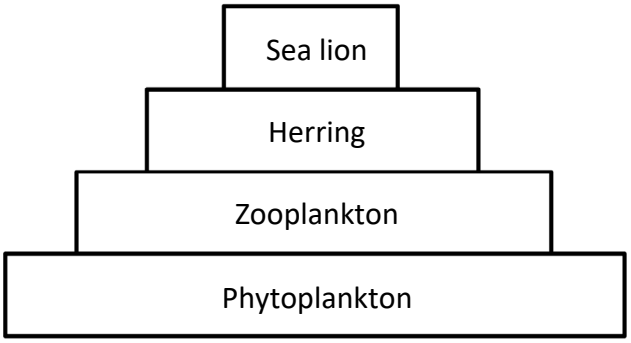
(ii) Explain in detail how any **two** of the parts **X**, **Y**, and **Z** help to regulate body temperature.

(b) What is the function of the sebaceous gland?

6. Two ecological pyramids are shown – one from a terrestrial ecosystem and one from an aquatic ecosystem.



Terrestrial ecosystem



Aquatic ecosystem

(a) What do you understand by the term *ecosystem*?

(b) Explain the difference in the shape of the ecological pyramids.

(c) What type of organism occupies the bottom of an ecological pyramid of numbers?

(d) What type of ecological relationship exists between the spider and the ladybird?

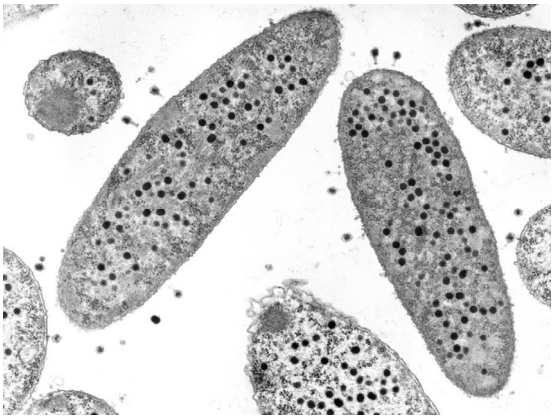
(e) Give **one** limitation of the use of ecological pyramids.

(f) Abiotic factors affect organisms in their habitats.

(i) Name any **one** abiotic factor present in an aquatic ecosystem.

(ii) Name any **one** abiotic factor present in a terrestrial ecosystem.

7. The image shows bacterial cells being infected with viruses.



(a) To which kingdom of living organisms do bacteria belong?

(b) Name the method by which bacteria reproduce.

(c) Explain why it is difficult to classify viruses into a kingdom of living organisms.

(d) Some species of bacteria are pathogenic. What is meant by the term *pathogenic*?

(e) Give **two** examples of the economic importance of bacteria.

1.

2.

(f) Many species of bacteria can survive in unfavourable environmental conditions. Name the structure that bacteria can form that helps them to survive these conditions.

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)** Explain the terms *hypothesis* and *double-blind testing*.

Hypothesis:
Double-blind testing:

(b) Answer the following questions based on your knowledge of practical activities completed.

(i) Describe how you tested a food for the presence of protein.

(ii) In preparing and examining an animal cell using the light microscope, describe how you prepared the slide.

(iii) As part of your habitat study, you collected organisms using various collection methods. Name **and** describe how you used any **two**.

1.
2.

9. **(a)** Water enters cells by osmosis. Explain the term *osmosis*.

(b) During your practical studies, you carried out an investigation to demonstrate osmosis. Using a labelled diagram, describe how you demonstrated osmosis. Include a description of the control **and** a safety precaution you took.

Labelled diagram:

10. **(a)** Distinguish between the terms, *systole* **and** *diastole*.

(b) Answer the following questions in relation to the dissection, display and identification of the parts of a sheep's or an ox's heart.

(i) Explain how you distinguished the front of the heart from the back.

(ii) Name **one** piece of equipment you used to make an incision.

(iii) During your dissection you located the tricuspid valve.
State the exact location of this valve.

(iv) What did you do to expose the semi-lunar valve?

(v) Describe **one** difference you observed between the right side of the heart **and** the left side after your dissection.

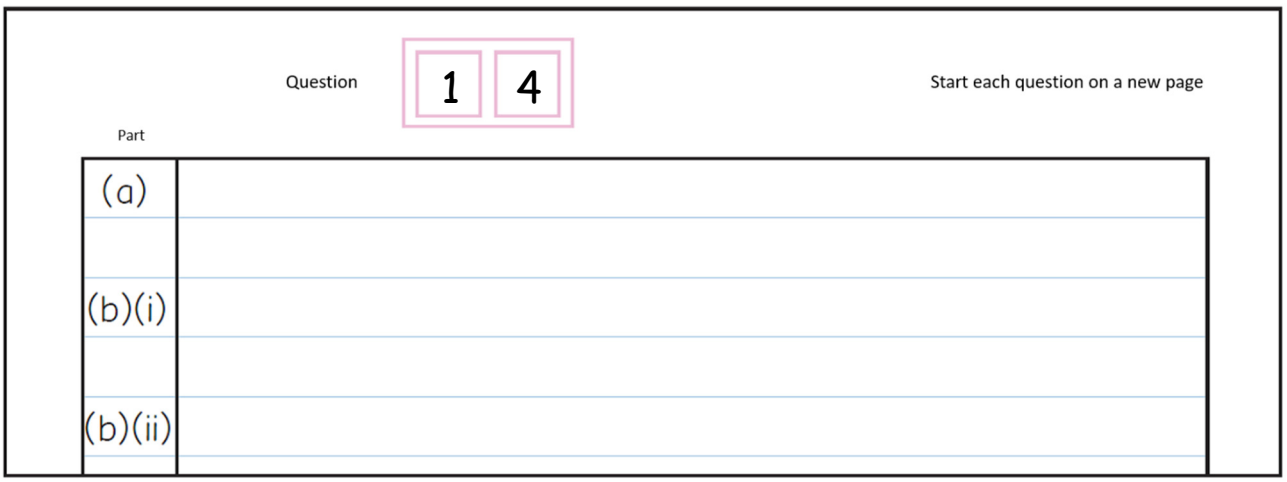
(vi) In the space provided below, sketch the internal structure of the heart dissection showing where you located the following: **septum**, **right ventricle**, **left atrium**.

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.

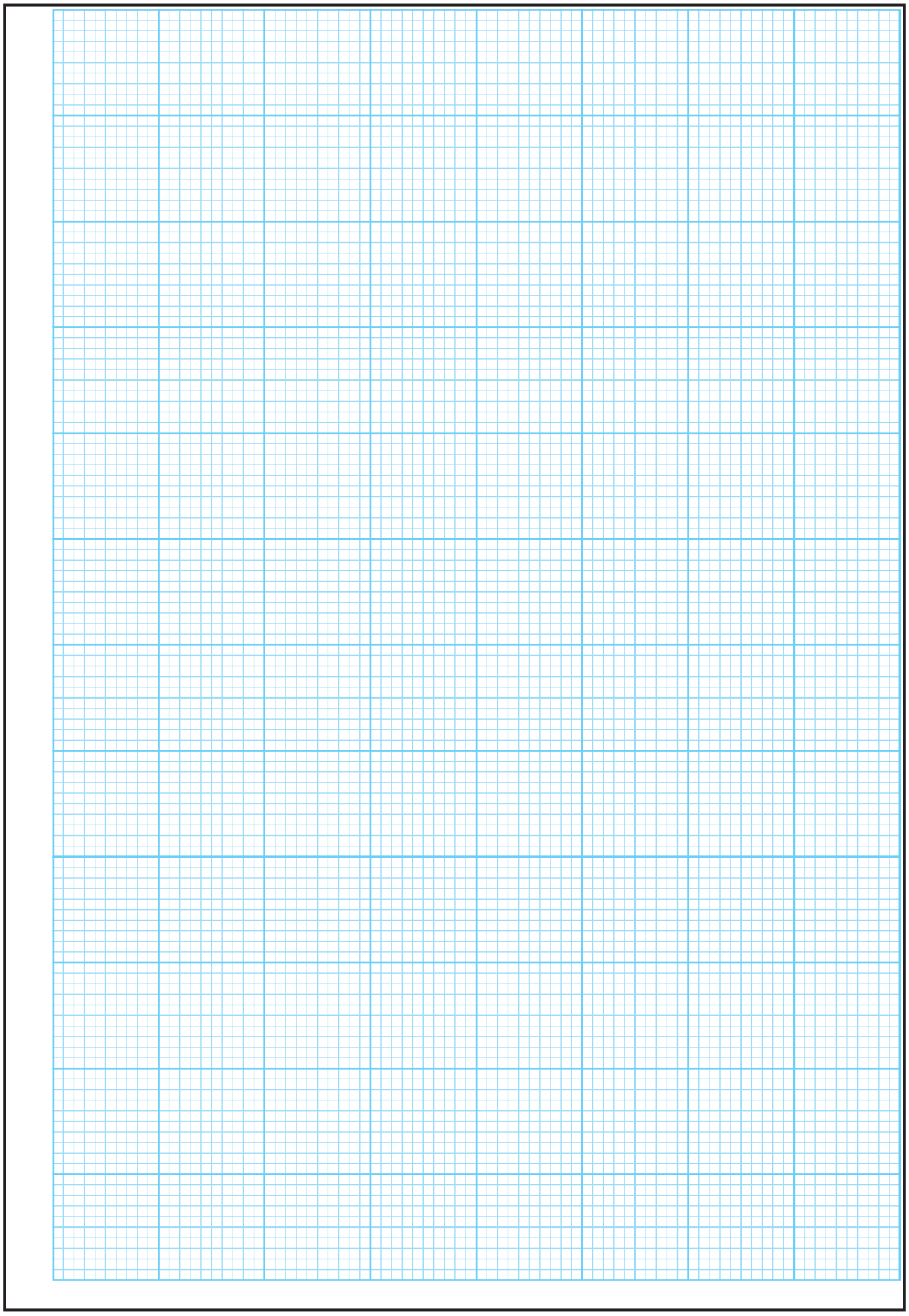


There are two pages of graph paper on the next two pages of this answerbook. On pages with graph paper, the box for the question number is at the bottom of the page.

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



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Leaving Certificate – Higher Level

Biology - Sections A and B and Answerbook

3 hours