2024.M44

2024L025A1EL

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2024

Biology

Sections A and B and Answerbook

Higher Level

Tuesday 11 June Afternoon 2:00 - 5:00

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) Which **three** chemical elements are present in **all** lipids?

(b) How do fats and oils differ at room temperature?

(c) Give **one** way phospholipids differ from triglycerides.

(d) Give **one** metabolic role of lipids in cells.

(e) Give **one** structural role of lipids in cells.

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

2. Answer the following questions based on your knowledge of the scientific method.

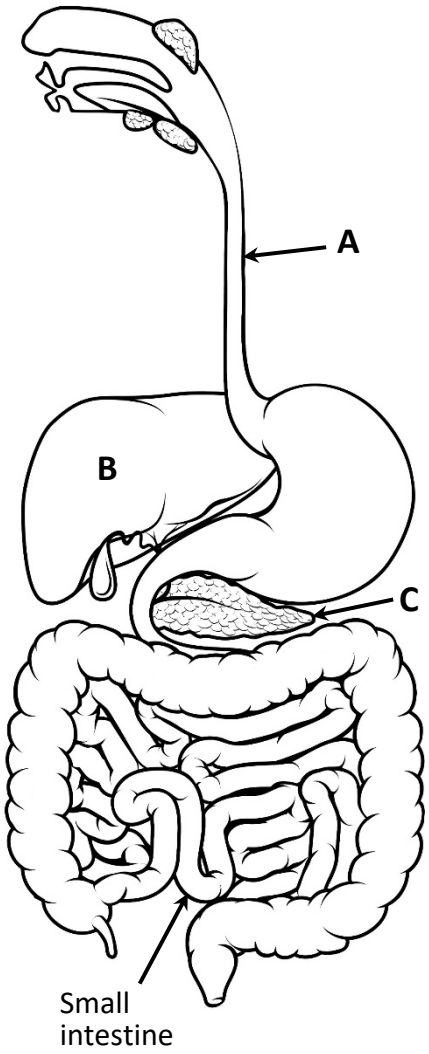
(a) After making an observation, a biologist often develops a hypothesis.
What is a hypothesis?

(b) A biologist tests their hypothesis by designing an experiment.
State **two** principles of good experimentation.

(c) Outline the steps of the scientific method that follow the design of an experiment.

(d) The scientific method also has limitations.
State any **one** limitation of the scientific method.

3. The diagram shows the human alimentary canal.



(a) Name tube **A**, organ **B** and gland **C**.

Tube A:
Organ B:
Gland C:

(b) Give **one** function of tube **A**.

Function:

(c) Give **one** function of organ **B**.

Function:

(d) Give **one** function of gland **C** in relation to the digestive system.

Function:

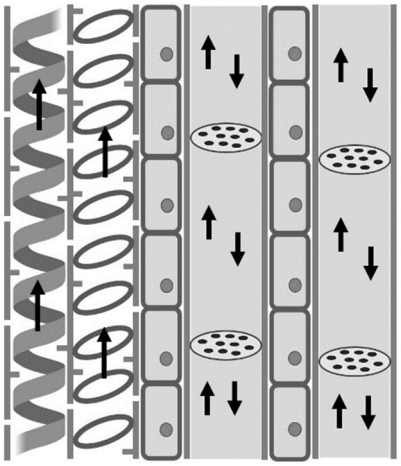
(e) State **one** structural feature of the small intestine that enables it to carry out its function.

(f) Symbiotic bacteria are present in the alimentary canal.
Give **two** functions of these symbiotic bacteria.

4. The diagram shows a longitudinal view of xylem vessels **and** phloem in plants.

(a) Label any **one** structure **on the diagram below** by writing in the box provided **and** draw an arrow from the box to the named structure.

Label:

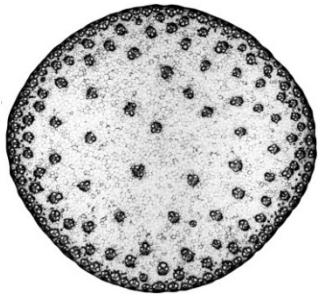


(b) To which type of plant tissue do xylem and phloem belong?

(c) Give **one** function of xylem.

(d) Give **one** function of phloem.

(e) The image shows how the tissue containing xylem and phloem is arranged in a transverse section (TS) of a stem.



(i) Is this stem a monocotyledonous (monocot) stem or a dicotyledonous (dicot) stem?

(ii) Justify your answer above.

(f) State the location of the tissue containing xylem and phloem in a transverse section of a root.

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

		True	False
(a)	Cell walls are only found in plant cells.	☐	☐
(b)	A turgid cell has lost a lot of water.	☐	☐
(c)	Fermentation does not use oxygen.	☐	☐
(d)	DNA is only found in the nucleus.	☐	☐
(e)	There are no hydrogen bonds in a molecule of DNA.	☐	☐
(f)	Adenine and guanine are purine bases.	☐	☐
(g)	Chromosomes are composed of DNA and protein.	☐	☐

6. Distinguish clearly between **each** member of the following pairs of terms.

(a) Ectotherm and endotherm

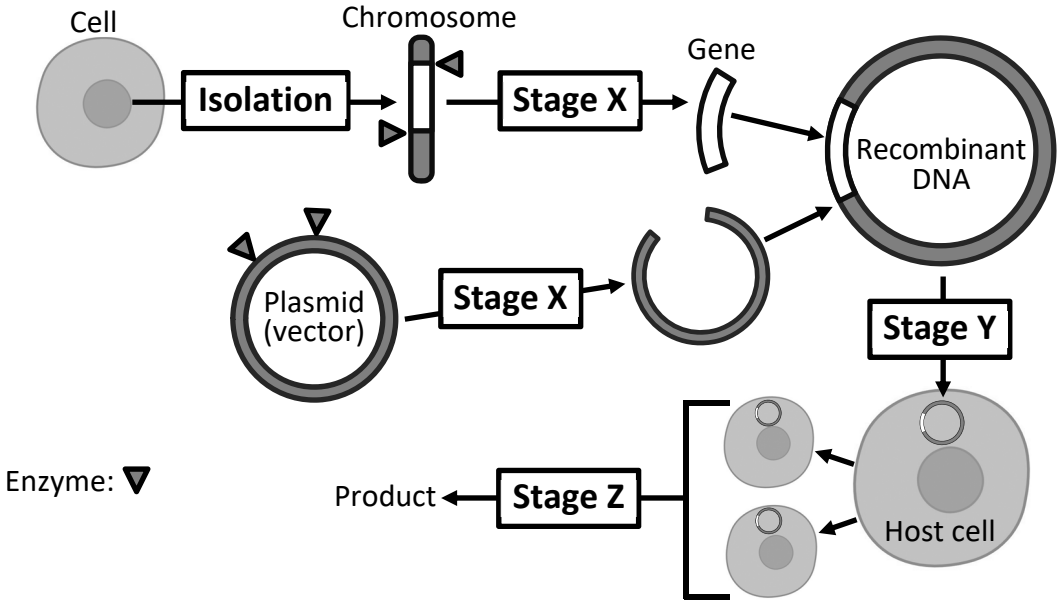
(b) Ligament and tendon

(c) Carpal and carpel

(d) Haploid and diploid

(e) Systole and diastole

7. Isolation of DNA is the first stage of genetic engineering.
Three of the **other** stages are labelled Stage **X**, Stage **Y** and Stage **Z** in the diagram.



(a) Explain the term *genetic engineering*.

(b) Name **each** stage **X**, **Y** and **Z**.

Stage X:
Stage Y:
Stage Z:

(c) Give **one** application of genetic engineering for **each** of the following:

(i) Plant

(ii) Animal

(iii) Micro-organism

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)** Distinguish between the terms *coding DNA* **and** *non-coding DNA*.

(b) As part of your practical studies you isolated DNA from plant tissue.
Describe how you isolated DNA from a **named** plant or **named** plant tissue.
You may include a labelled diagram if you wish.

9. **(a)** Answer the following in relation to enzymes and enzyme immobilisation.

(i) Briefly explain the term *enzyme*.

(ii) State **one** advantage of immobilising enzymes.

(b) During your practical studies, you prepared one enzyme immobilisation **and** examined its application.

(i) Name the enzyme **or** cell you immobilised.

(ii) Describe the procedure you used to immobilise the enzyme **or** cell.
You may include a labelled diagram if you wish.

(iii) Describe how you examined the application of the immobilised enzyme **or** cell.

10. **(a)** **(i)** What is meant by *dormancy* in seeds?

(ii) Give **one** advantage of seed dormancy for plants.

(b) During your practical studies you investigated the action of digestive enzymes in germinating seeds using either starch agar or skimmed milk plates.

(i) Describe how you set up the apparatus for this investigation.
You may include a labelled diagram if you wish.

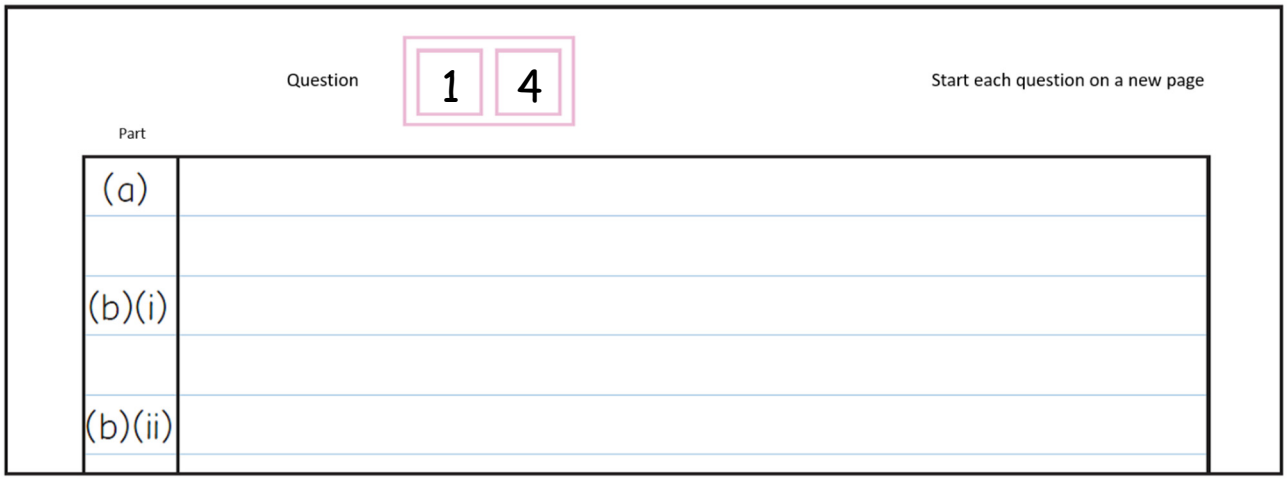
(ii) Explain how you knew digestion had occurred.

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.

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Leaving Certificate – Higher Level

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Tuesday 11 June

Afternoon 2:00 - 5:00