2022.M43

2022L025G1EL

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2022

Biology

Sections A and B and Answerbook

Ordinary Level

Tuesday 14 June Afternoon 2:00 - 5:00

290 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 a 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) Name any **three** elements found in fats.

(b) In a triglyceride, three molecules of fatty acids are joined to one molecule of …….

(c) Name a fat-soluble vitamin.

(d) Name a laboratory test used to detect fats in food.

(e) How do fats differ from oils?

2. (a) What is respiration?

(b) Name the **two** products of aerobic respiration.

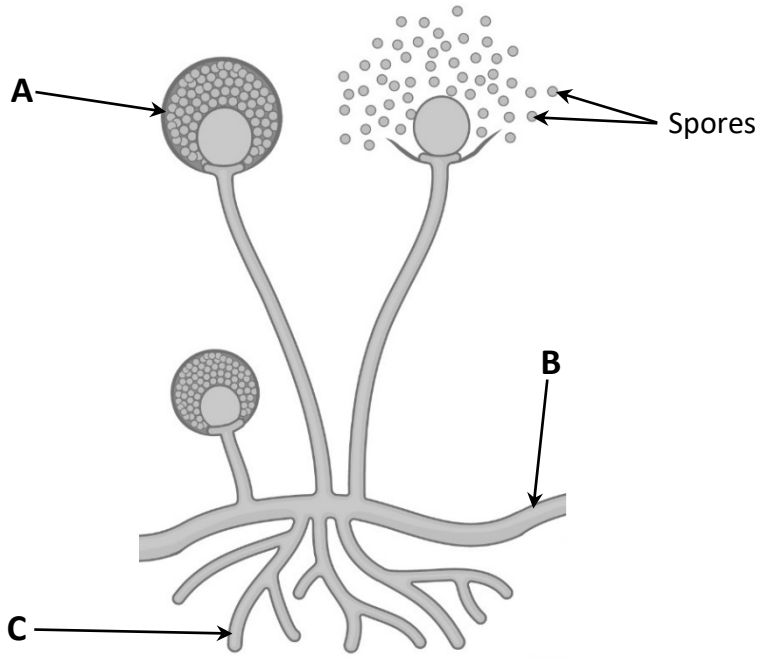
(c) Name the gas needed for aerobic respiration to occur.

(d) Aerobic respiration occurs in two stages.
Where in the cell does **each** stage occur?

Stage 1:
Stage 2:

(e) Which stage of aerobic respiration produces the most energy?

3. The diagram shows *Rhizopus*, a microorganism that causes food spoilage.



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

A:
B:
C:

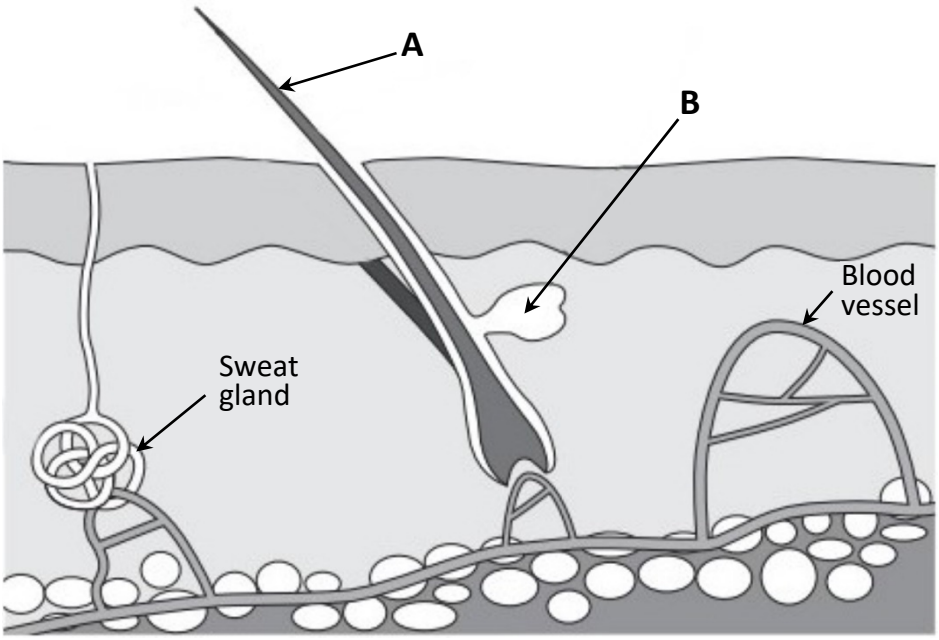
(b) What is the function of the spores produced by *Rhizopus*?

(c) *Rhizopus* is a saprophyte. What is meant by saprophytic nutrition?

(d) Name the kingdom in which *Rhizopus* is classified.

(e) State **one** other organism that belongs to the kingdom you named at part (d) above.

4. The diagram shows a section through human skin.



(a) Name the parts labelled **A** and **B** in the diagram.

A:
B:

(b) Sweat is produced by sweat glands. State **two** components of sweat.

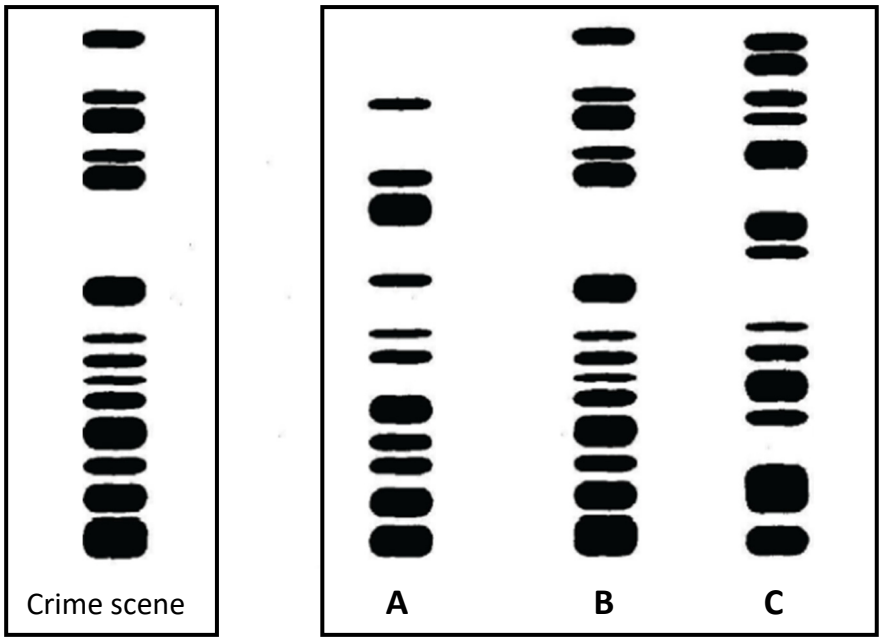
1:
2:

(c) Describe **two** ways the human body responds to cold conditions.

1:
2:

(d) Ectotherms are organisms that cannot easily control their own body temperature. Give **one** example of an ectotherm.

5. During an investigation a DNA profile was carried out in order to match a DNA sample from a crime scene with a sample from a suspect. The diagram shows the DNA profiles obtained.



(a) Which suspect DNA profile, **A** or **B** or **C** matches the DNA sample from the crime scene?

(b) Place each of the numbers **1**, **2**, **3**, **4** in the correct box below to show the correct sequence of events when creating a DNA profile.

(i) Separate DNA fragments based on their sizes

(ii) Analyse pattern of fragments

(iii) DNA is released from cells using detergent

(iv) DNA is cut into fragments using enzymes

(c) DNA strands are composed of linked pairs of bases. Name any **one** pair of these bases.

(d) State **one** other application for DNA profiling.

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

	True	False
Example:		
There are 12 thoracic vertebrae in the spine.	✓	
(a) Hormones are produced by endocrine glands.		
(b) Fertilisation usually occurs in the fallopian tube.		
(c) Hydrochloric acid is produced by the liver.		
(d) Bile is produced by the kidney.		
(e) Neurotransmitters are produced by nerve cells.		
(f) Antibiotics are produced by viruses.		
(g) Amylase is produced by the salivary glands.		

7. 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.

~~Theory~~ **Data** **Double blind test** **Variable** **Control** **Hypothesis**

Column A	Column B
An explanation for an observation supported by the results of an experiment	**Theory**
(a) A factor that can change during an investigation	
(b) An educated guess to explain an observation	
(c) Information and measurements collected during an investigation	
(d) A method used to prevent bias during an investigation	
(e) Comparison to an experiment	

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) Distinguish between a quantitative survey and a qualitative survey.

Quantitative:
Qualitative:

(b) A student conducted a survey in a habitat close to her home in order to estimate the percentage (%) frequency of different plants in the habitat.

(i) Describe the procedures she would have taken to carry out the survey.

The table below shows the data collected during the survey.

Plant	Station 1	Station 2	Station 3	Station 4	Station 5
Plantain		✓		✓	✓
Daisy	✓	✓	✓		✓
Dandelion	✓		✓		

(ii) Which plant had the highest % frequency?

(iii) What is the % frequency of the other **two named** plants in the table above?

Name:	Name:
%:	%:

(iv) What could the student have used to identify the plants correctly?

9. (a) (i) Fermentation is a process that does not use ……

(ii) Name the gas produced during alcohol fermentation.

(b) (i) Draw a labelled diagram in the space below of the apparatus that you used to prepare alcohol in the laboratory.

(ii) Describe **one** safety precaution you took during the activity.

(iii) Give a suitable temperature for this activity.

(iv) How did you know alcohol production had stopped?

(v) Briefly describe how you set up the control for this activity.

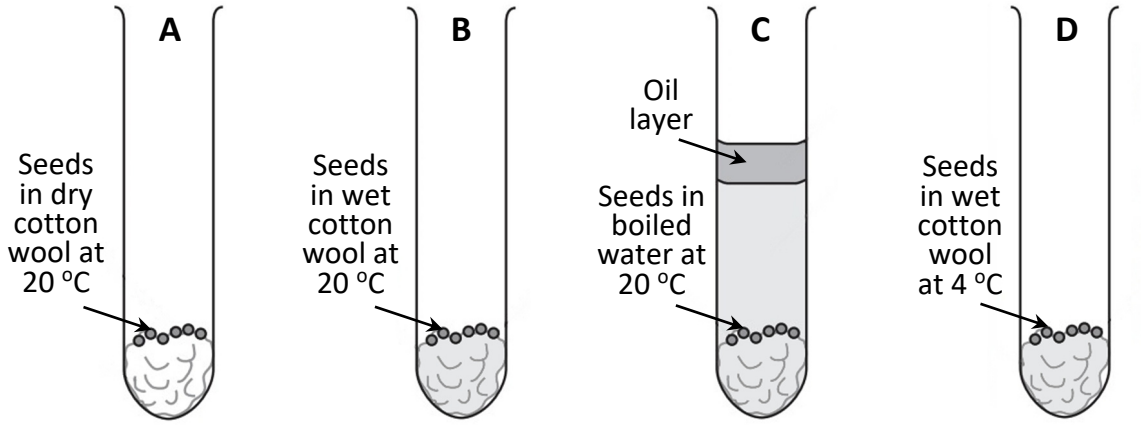
(vi) Name the test, or the chemicals you used, to show that alcohol was present.

10. (a) Germination is the regrowth of the plant embryo after a period of inactivity.

(i) What is the name given to this period of inactivity?

(ii) Give **one** location in a seed where food is stored.

(b) The diagram below shows an apparatus used to investigate the conditions needed for germination.



(i) Name a seed that could be used in this activity.

(ii) Why was dry cotton wool used in test tube **A**?

(iii) Why was boiled water and an oil layer used in test tube **C**?

(iv) How was a temperature of 4 °C maintained in test tube **D**?

(v) State the results observed for **each** test tube.

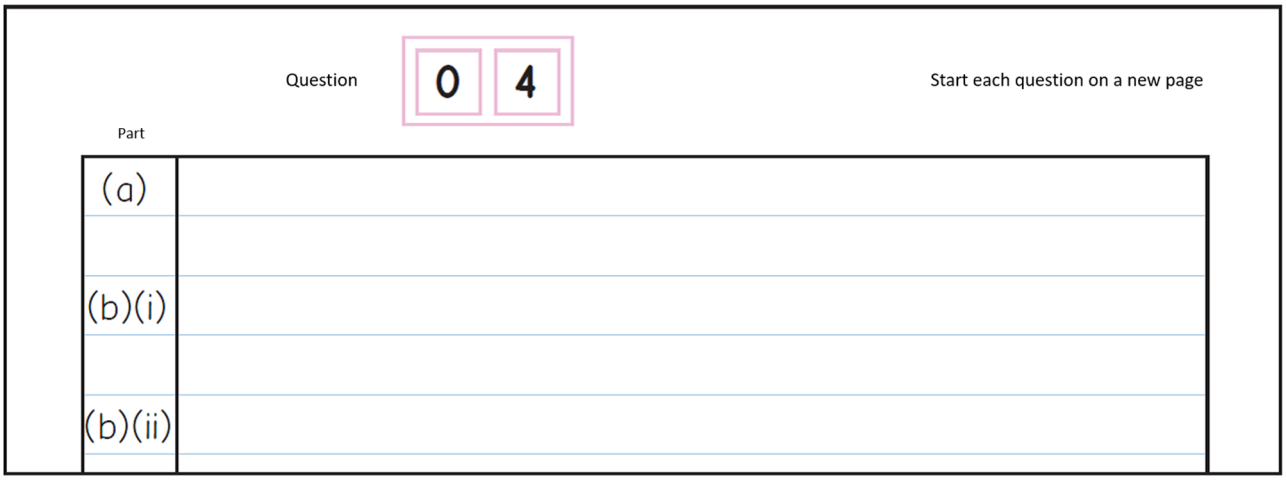
A:
B:
C:
D:

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 a pencil for sketches, graphs and diagrams only.

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Leaving Certificate – Ordinary Level

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Tuesday 14 June

Afternoon 2:00 - 5:00