



KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA



**NATIONAL
SENIOR CERTIFICATE**

GRADE 10

**LIFE SCIENCES
SEPTEMBER TEST**

2025

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Duration: 1 Hour

MARKS: 50

N.B. This question paper consists of 10 pages including this page.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answers to EACH question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. Make ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You must use a non-programmable calculator, protractor and a compass, where necessary.
11. Write neatly and legibly.

SECTION A**QUESTION 1**

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.4) in your ANSWER BOOK, for example 1.1.5 D.

1.1.1 Which ONE of the following factors have an influence on the history of life on earth?

- A Nitrogen levels
- B Carbon dioxide levels
- C Sea levels
- D Diseases

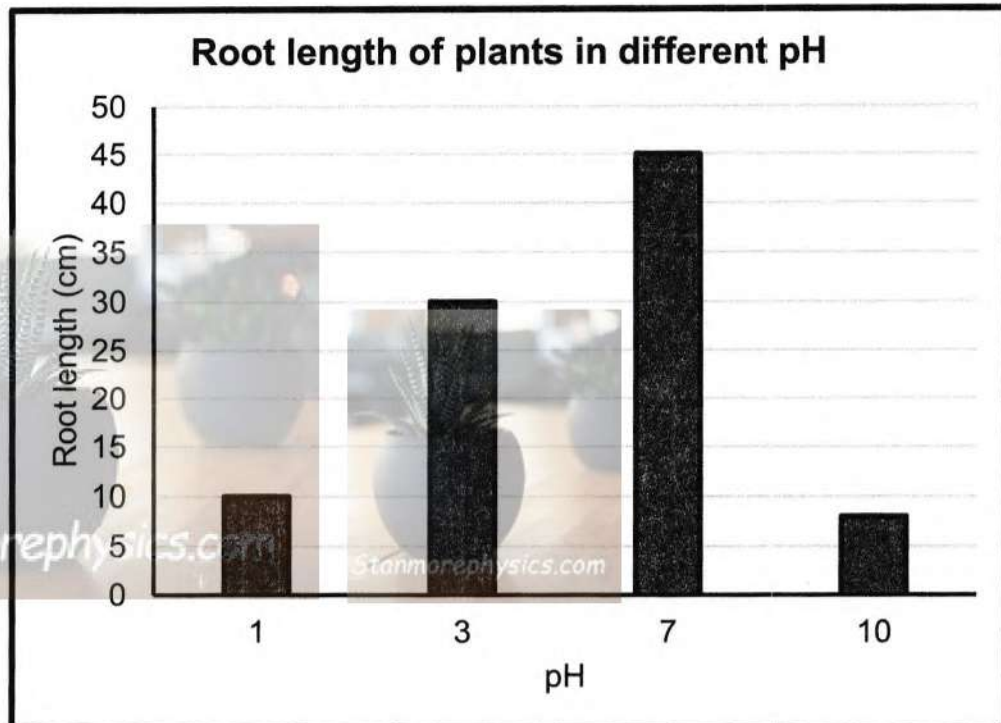
1.1.2 The largest super – continent before continental drift occurred was...

- A Pangea.
- B Africa.
- C Gondwanaland.
- D Laurasia.

QUESTIONS 1.1.3 AND 1.1.4 ARE BASED ON THE FOLLOWING INVESTIGATION.

An investigation was carried out to investigate the effect of alkaline pH on the growth of roots of young Austrian pine plants.

The graph below shows the results.



1.1.3 Which ONE of the following is the correct planning step for this investigation?

- A Planting seedlings of the same age
- B Deciding on the sample size
- C Measuring soil pH
- D Measuring root length

1.1.4 Based on the results, Austrian plants...

- A grow best in alkaline soil.
- B grow best in acidic soil.
- C are not affected by pH of the soil.
- D grow best in neutral soil pH.

(4 × 2) (8)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question numbers (1.2.1 to 1.2.4) in the ANSWER BOOK.

1.2.1 A large area with a certain climate and a variety of plants and animals

1.2.2 An organism that feeds on meat only as part of its diet

1.2.3 The study of fossils

1.2.4 The process by which populations change over time due to the changes in their environment

(4 × 1)

(4)

1.3 Indicate whether each of the statements in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B**, or **none** next to the question number (1.3.1 to 1.3.2) in the ANSWER BOOK.



COLUMN I	COLUMN II
1.3.1 The study of past and present distribution of biological organisms in the world	A: Biogeography B: Evolution
1.3.2 Long period where earth experienced extremely cold weather	A: Ice age B: Fossil

(2 X 2)

(4)

- 1.4 The table below shows the different amounts of CO_2 entering the atmosphere ($\blacktriangle$) and being removed from the atmosphere ($\blacktriangledown$). The numbers represent billions of tons of CO_2 per year.

ATMOSPHERE			
120	60	60	1.1
$\blacktriangledown$	$\blacktriangle$	$\blacktriangle$	$\blacktriangle$
			
Vegetation	P	Q	R
LITHOSPHERE			

- 1.4.1 Identify:

(a) Q

(1)

(b) R

(1)

- 1.4.2 Name the biological process that uses 120 billion tons of CO_2 from the atmosphere in vegetation.

(1)

- 1.4.3 Which source of carbon dioxide (P, Q or R) contributes the most net amount of CO_2 into the atmosphere?

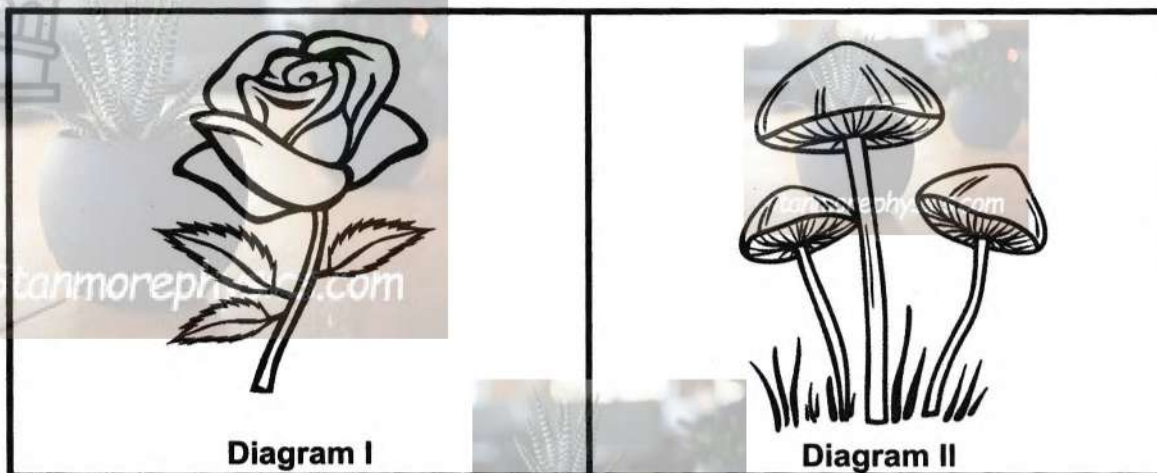
(1)

(4)

TOTAL SECTION A: 20

SECTION B**QUESTION 2**

- 2.1 The diagrams below show organisms belonging to different classification kingdoms.



- 2.1.1 Name the kingdom to which each of the organisms belong:

(a) **Diagram I**

(1)

(b) **Diagram II**

(1)

- 2.1.2 Some eukaryotic organisms do not fit into the plant, animal, or fungi kingdoms. Name the kingdom to which these organisms belong.

(1)

- 2.1.3 State ONE characteristic common to both organisms in the diagrams above.

(1)

- 2.1.4 The scientific name for the organism in **diagram I** is *Rosa rubiginosa*.

Write down the genus name for the organism in **diagram I**.

(1)

- 2.1.5 Name the kingdom to which all prokaryotic organisms belong.

(1)

- 2.1.6 The organism in **diagram II** feeds on dead and decaying organisms. What term describes this type of organism?

(1)

(7)

2.2 The passage below refers to mass extinction in the history of life.

Top Two Mass Extinctions

1. Permian-Triassic Extinction (252 million years ago): The "Great Dying" wiped out 96% of marine species and 70% of terrestrial species. Volcanic eruptions, climate change, and reduced oxygen levels contributed to this devastating event.
2. Cretaceous-Paleogene Extinction (66 million years ago): A massive asteroid impact, combined with volcanic activity and climate change, led to the extinction of dinosaurs and around 75% of all species. These events significantly impacted Earth's biodiversity and shaped the course of evolution.

2.2.1 What is Mass extinction?

(1)

2.2.2 Name the most recent mass extinction mentioned in the passage

(1)

2.2.3 From the passage, state:

(a) How many years ago did the greatest number of species become extinct.

(1)

(b) Two possible causes of dinosaurs becoming extinct.

(2)

2.2.4 If there were 82 500 marine species that existed before the Permian-Triassic extinction, calculate the number of species that would have survived the extinction. Show all workings.

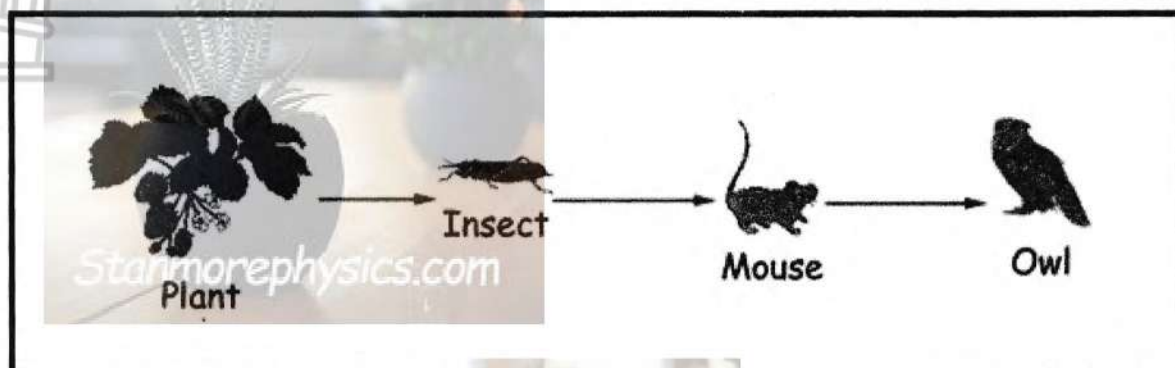
(3)

(8)

[15]

QUESTION 3

3.1 The diagrams below show a typical food chain.



3.1.1 From this food chain identify the:

(a) Producer

(1)

(b) Secondary consumer

(1)

3.1.2 State the organism that receives the least energy in this food chain.

(1)

3.1.3 Explain how the ecosystem would be affected if all the owls were removed from this ecosystem.

(3)

(6)

3.2 Grade 10 learners investigated the effect of nitrogen-fixing bacteria on plant growth in soil with low nitrogen levels.

The procedure was as follows:

- Prepared two pots of identical pots with soil that has low nitrogen levels.
- Pot **A**: Inoculated (infused) one set of pots with nitrogen-fixing bacteria.
- Pot **B**: no inoculation.
- Planted bean seeds in both pots of pots.
- Measured and recorded the initial height of the seedlings.
- Measure and record the final height of the seedlings after 5 weeks.

The results are shown in the table below.

Pots	Average heights (cm)	
	Initial	Final
Pot A	5	28
Pot B	5	12

3.2.1 Identify the independent variable for this investigation. (1)

3.2.2 What is the role of nitrogen-fixing bacteria in the nitrogen cycle? (1)

3.2.3 State ONE way in which the learners could have ensured validity of this investigation. (1)

3.2.4 Explain how the presence of nitrogen-fixing bacteria affects plant growth in soil with low nitrogen levels? (3)

3.2.5 State the role of set **B** in this investigation. (1)

3.2.6 What conclusion can be drawn from these results? (2)

(9)

[15]

TOTAL SECTIONB: 30
GRAND TOTAL: [50]



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GRADE 10

LIFE SCIENCES

**SEPTEMBER 2025
TEST**

MARKING GUIDELINES

MARKS: 50

This marking guidelines consists of 6 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES SEPTEMBER TEST 2025

1. **If more information than marks allocated is given**
Stop marking when maximum marks is reached and put a wavy line and 'max' in the right-hand margin.
2. **If, for example, three reasons are required and five are given**
Mark the first three irrespective of whether all or some are correct/incorrect.
3. **If whole process is given when only a part of it is required**
Read all and credit the relevant part.
4. **If comparisons are asked for but descriptions are given**
Accept if the differences/similarities are clear.
5. **If tabulation is required but paragraphs are given**
Candidates will lose marks for not tabulating.
6. **If diagrams are given with annotations when descriptions are required**
Candidates will lose marks.
7. **If flow charts are given instead of descriptions**
Candidates will lose marks.
8. **If sequence is muddled and links do not make sense**
Where sequence and links are correct, credit. Where sequence and links are incorrect, do not credit. If sequence and links become correct again, resume credit.
9. **Non-recognised abbreviations**
Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of the answer if correct.
10. **Wrong numbering**
If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.
11. **If language used changes the intended meaning**
Do not accept.
12. **Spelling errors**
If recognisable, accept the answer, provided it does not mean something else in Life Sciences or if it is out of context.
13. **If common names are given in terminology**
Accept, provided it was accepted at the national memo discussion meeting.
14. **If only the letter is asked for but only the name is given (and vice versa)**
Candidates will lose marks

15. **If units are not given in measurements**
Candidates will lose marks. Memorandum will allocate marks for units separately.
16. **Be sensitive to the sense of an answer, which may be stated in a different way.**
17. **Caption**
All illustrations (diagrams, graphs, tables, etc.) must have a caption.
18. **Code-switching of official languages (terms and concepts)**
A single word or two that appear(s) in any official language other than the learners' assessment language used to the greatest extent in his/her answers should be credited if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.



SECTION A

QUESTION 1

- 1.1 1.1.1 C✓✓
 1.1.2 A✓✓
 1.1.3 B✓✓
 1.1.4 D✓✓

(4 x 2) (8)

- 1.2 1.2.1 Biome✓
 1.2.2 Carnivore✓
 1.2.3 Paleontology✓
 1.2.4 Evolution✓

- 1.3 1.3.1 A only✓✓
 1.3.2 A only✓✓

1.4

- 1.4.1 (a) Fire✓/combustion

- (b) Fossil fuel✓

- 1.4.2 Photosynthesis✓

- 1.4.3 P✓

(4)

(4)

(1)

(1)

(1)

(1)

(4)

TOTAL QUESTION 1: 20

SECTION B

QUESTION 2

- 2.1 2.1.1 (a) Plantae✓ (1)
 (b) Fungi✓ (1)
 2.1.2 Protista✓ (1)
 2.1.3 Presence of a cell wall✓ (1)
 2.1.4 Rosa✓ (1)
 2.1.5 Monera✓ (1)
 2.1.6 Saprophytes✓ (1)
(7)
- 2.2 2.2.1 The complete dying out of many species within a short period of time✓ (1)
 2.2.2 Cretaceous-Paleogene Extinction✓ (1)
 2.2.3 (a) 252✓ mya (1)
 (b) -massive asteroid impact✓
 -volcanic activity✓ and Stanmorephysics.com
 - climate change ✓ (2)

Any

2.2.4 $(100-96 = 4) \checkmark\%$
 $4 \div 100 \times 82\,500 \checkmark$
 $= 3300 \checkmark^*$

OR

$96/100 \times 82\,500 \checkmark$
 $= 79\,200$
 $82\,500 - 79\,200 \checkmark$
 $= 3300 \checkmark^*$

(3)÷
(8)
[15]

QUESTION 3

- 3.1 3.1.1 (a) Plant✓ (1)
 (b) Mouse✓ (1)
 3.1.2 Owl✓ (1)
 3.1.3 - There will be less organisms feeding on the mice✓
 - resulting in mice population increasing✓
 - this will result in a decrease in insect population✓
 - and an overpopulation of plants✓ Any (3)
(6)
- 3.2 3.2.1 nitrogen fixing bacteria✓ (1)
 3.2.2 they convert free nitrogen gas into nitrates✓ (1)
 3.2.3 Same:
 - species of plants✓
 - age of plants✓
 - type of soil must be used✓
 - measuring instrument✓
 - person must take measurements✓
 - soil pH✓
 - light✓/temperature/humidity/water Any (1)
 3.2.4 - Bacteria convert free nitrogen gas from the atmosphere✓
 - into nitrates✓ for plant nutrition
 - to make more plant protein✓
 - resulting in rapid growth ✓ Any (3)
 3.2.5 To ensure that the results obtained are due to nitrogen-fixing bacteria only✓/ serves as a control (1)
 3.2.6 The presence of nitrogen fixing bacteria increases plant growth in soil with low nitrogen content✓✓ (2)
(9)
[15]

TOTAL SECTION B: 30
GRAND TOTAL: [50]