



# LIMPOPO

**PROVINCIAL GOVERNMENT**  
REPUBLIC OF SOUTH AFRICA

**DEPARTMENT OF  
EDUCATION**

**GRADE 11**

**AGRICULTURAL SCIENCE**

**CONTROLLED TEST NO :2**

**12 SEPTEMBER 2025**

**Marks : 100**

**Time : 2 Hours**

This question paper consists of 10 pages

**INSTRUCTIONS**

1. The question paper consists of TWO sections, namely SECTION A and SECTION B.
2. Answer ALL the questions in the ANSWER SHEET.
3. Read the questions carefully.
4. Answer ONLY what has been asked.
5. Start EACH question on a new page.
6. Number the answers correctly according to the numbering system used in this question paper.
7. You may use a non-programmable calculator.
8. show ALL the calculations, including formulae, where applicable.
9. Write neatly and legibly.

**SECTION A****QUESTION 1**

1. Various options are provided as a possible answers to the following questions. Choose the answers and write only the letter (A – D) next to the question number (1.1.1 to 1.1.5) on the ANSWER SHEET, for example 1.1.6 D

1.1.1 The process by which carbohydrates are oxidized, with the release of carbon dioxide, water and energy, is called .....

- A oxidation
- B transpiration
- C respiration
- D photosynthesis

1.1.2 Water molecules move in the plant through the.....

- A xylem tissue , in any direction
- B phloem tissue, in any direction
- C xylem tissue, upwards in the plant
- D phloem tissue, upwards in the plant

1.1.3 ..... is the carrier molecule that contains energy that is used during active transport.

- A NADPH
- B NADP
- C ADP
- D ATP

1.1.4 The following is an example of an organic fertilizer.

- A Ammonium nitrate
- B Compost
- C Urea
- D Limestone ammonium nitrate

1.1.5 The following leaf pigment is responsible for the green color in leaves.

- A Chlorophyll
- B Carotenes
- C Xanthophyll
- D Carotenoid

**(5 x 2 = 10)**

1.2 Choose the description in COLUMN B that best matches the term/phrase in COLUMN A. Write only the letter (A–G) next to the question number (1.2.1–1.2.5) in the ANSWER BOOK, for example 1.2.6 B

|       | <b>COLUMN A</b> |   | <b>COLUMN B</b>                                                                          |
|-------|-----------------|---|------------------------------------------------------------------------------------------|
| 1.2.1 | Turgor          | A | Leaves that turn yellow due to the non-production or breakdown of chlorophyll in plants. |
| 1.2.2 | Potassium       | B | Deficiency causes older leaves to turn yellow.                                           |
| 1.2.3 | Chlorosis       | C | Cell is soft, weak and flabby.                                                           |
| 1.2.4 | Nitrogen        | D | Deficiency causes internal corking and fruit, tubers and roots are deformed and cracked. |
| 1.2.5 | Boron           | E | Important for cation exchange in plants.                                                 |
|       |                 | F | Pressure in plant cells due to the absorption of water.                                  |
|       |                 | G | Necessary for cation exchange in plants.                                                 |

**(5x 2 = 10)**

1.3 Give ONE Word/term for each of the following descriptions. Write only the correct word/term next to the question numbers (1.3.1 to 1.3.5) in the ANSWER SHEET.

- 1.3.1 Living organisms that can produce their own organic food.
- 1.3.2 A solution containing many dissolved substances.
- 1.3.3 Movement of water from the roots to the stems and leaves, through the cell membrane and cytoplasm of adjacent cells.
- 1.3.4 The process by which excess water is removed from the leaves through the hydathodes.
- 1.3.5 The ploughing back of crops into the soil while they are still green and is juicy.

**(5x 2 = 10)**

1.4 Change the UNDERLINED WORD/S in each of the following statements to make it TRUE. Write only the answer next to the question numbers (1.4.1 to 1.4.2) in the ANSWER SHEET

- 1.4.1 Anabolic processes usually occur when molecules or compounds are broken down into simpler molecules.
- 1.4.2 Passive absorption occurs against the concentration gradient.
- 1.4.3 Gypsum fertilization neutralizes acidic soil.
- 1.4.4 The splitting of water molecules into hydrogen and oxygen atoms in the presence of light energy is called photophosphorylation.
- 1.4.5 Chlorosis is when plant tissue dies.

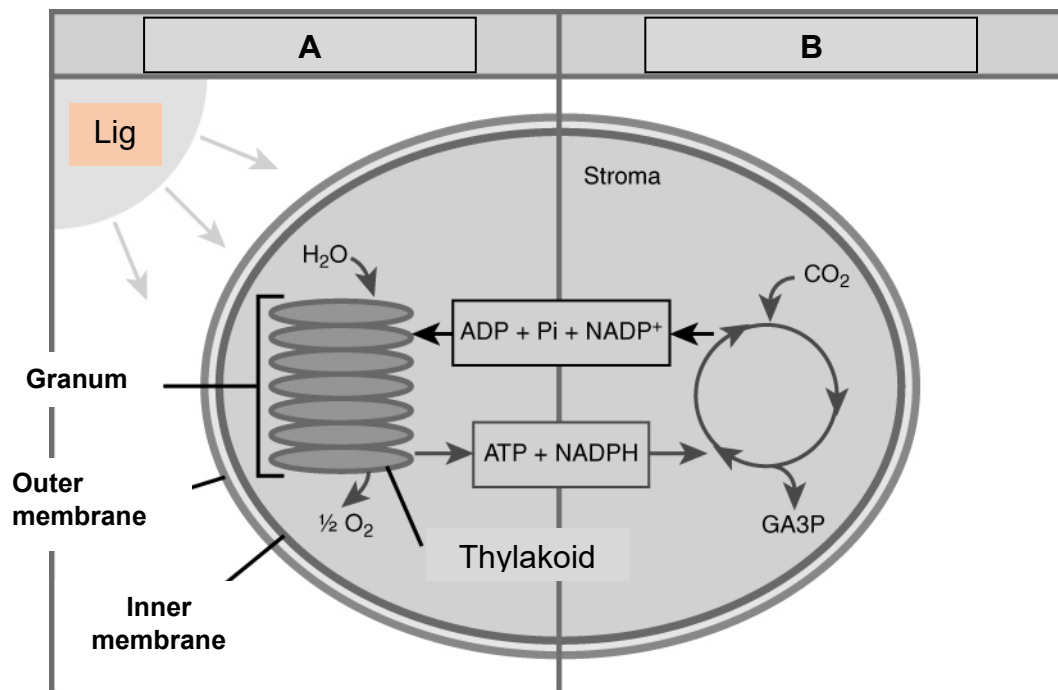
(5)

[35]

## SECTION B

### QUESTION 2

2.1 Study the following diagram and answer the questions that follow:

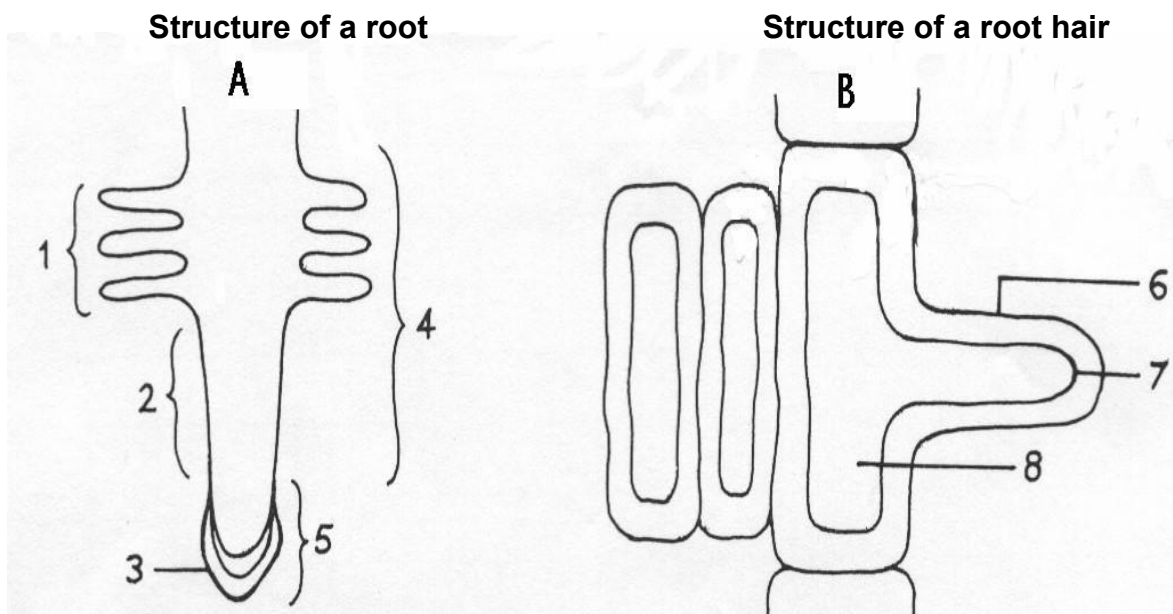


- 2.1.1 Name the process represented in the diagram above. (1)
- 2.1.2 Name phase A and phase B in the diagram above. (2)
- 2.1.3 Name the organelle in the plant where the process shown in the diagram takes place. (1)
- 2.1.4 Suggest THREE ways in which farmers can manipulate their crops to obtain a higher production yield by speeding up the process named in 2.1.1. (3)
- 2.1.5 The products of phase B are stored in different plant parts.  
Name TWO storage organs in plants where the product is stored. (2)
- 2.1.6 Name the process during which stored energy in living cells is released and are available for use in metabolic processes. (1)
- 2.1.7 Tabulate TWO differences between the process mentioned in 2.1.1 and 2.1.6. (4)

**[14]**

**QUESTION 3**

3.1 Study the information below and answer the questions that follow.



3.1.1 Name the following regions/parts in diagram A AND give ONE function of each.

- |       |   |     |
|-------|---|-----|
| (i)   | 1 | (2) |
| (ii)  | 2 | (2) |
| (iii) | 3 | (2) |
| (iv)  | 5 | (2) |

3.1.2 Name the type of groundwater that is available to plants. (1)

3.1.3 Explain the difference between diffusion and osmosis. (4)

3.2 Study the information below and answer the questions that follow.

A young farmer in Limpopo province notices that the leaves of his tomato plants, during the hot summer days, begins to wilt towards noon. However, he noticed that the leaves were turgid early in the morning. He also noticed that tomato plants growing in the shade wilted less than those growing in the sun.

The local agriculturalist explains that the observations can be attributed to osmotic flow and transpiration pull in plants. He helps the young farmer to conduct an experiment to understand the phenomenon. The results below are obtained.

| Time of day | Temperature (°C) | Rate of Water Absorption (mL/hour) |
|-------------|------------------|------------------------------------|
| 6:00 AM     | 15               | 3                                  |
| 9:00 AM     | 20               | 6                                  |
| 12:00 PM    | 28               | 10                                 |
| 3:00 PM     | 32               | 12                                 |
| 6:00 PM     | 25               | 8                                  |
| 9:00 PM     | 20               | 5                                  |
| 12:00 AM    | 18               | 4                                  |

- 3.2.1 Identify TWO pressures in plants, from the scenario above, which allows water to move from the roots to the stems and leaves. (2)
- 3.2.2 Name TWO functions of water in plants. (2)
- 3.2.3 Name the part of the plant that is modified for evaporation of water through transpiration to the atmosphere. (2)
- 3.2.4 Draw a line graph to show the results of the experiment in the scenario above about the relationship between the time of day versus the rate of water absorption. (6)
- 3.2.5 By using your knowledge about osmotic flow, transpiration pull and transpiration, explain to the young farmer why his tomato plants in full sunlight wilt faster than the tomato plants in the shade. (4)

**[29]**

## QUESTION 4

- 4.1 Explain the difference between macroelements and microelements. (4)
- 4.2 Study the photo below and answer the questions that follow.



- 4.2.1 What do the numbers 2:3:2 indicate? (3)
- 4.2.2 What is the percentage of macronutrients in the bag of fertilizer? (1)
- 4.2.3 Calculate the percentage of phosphorus in the mixture. Show all your calculations. (4)
- 4.3 Name TWO factors that affect the ability of plants to absorb minerals from the soil. (2)
- 4.4 Use the list of words below, and write down the one that best fits EACH of the descriptions that follow.

Fertigation, Band placement, Top-dressing, Broadcasting

- 4.4.1 Fertilizer is applied to the crops during the growing season. (1)
- 4.4.2 Fertilization is applied through irrigation water. (1)
- 4.4.3 Fertilizer is applied evenly as granular fertilizer on top of the ground. (1)
- 4.4.4 Fertilizer applied to one or both sides of a row of plants. (1)

4.5 Organic fertilization has many benefits for agriculture.

4.5.1 Name any TWO examples of organic fertilization. (2)

4.5.2 Name TWO disadvantages of organic fertilisation. (2)

**[22]**

**GRAND TOTAL ..... [100]**

