Province of the
EASTERN CAPE
EDUCATION

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Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2025

AGRICULTURAL SCIENCES P2

MARKS: **150**

TIME: **2½ hours**

This question paper consists of 14 pages.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of TWO sections, namely SECTION A and SECTION B.
2. Answer ALL the questions in the ANSWER BOOK.
3. Start each question on a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. You may use a non-programmable calculator.
6. Show ALL calculations, including formulae, where applicable.
7. Write neatly and legibly.

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SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1.1 to 1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 The energy needed for the process of photosynthesis is obtained from …

A respiration.
B sunlight.
C nutrients.
D carbon dioxide.

1.1.2 The following mechanisms are involved in the movement of water from the roots to stems and leaves.

A Transpiration pull and respiration pull
B Respiration pull and capillary action
C Capillary action and transpiration pull
D Root pressure and respiration pull

1.1.3 The leaf pigment responsible for the yellow colour in plants is/are …

A carotenoids.
B chlorophyll.
C xanthophylls.
D carotenes.

1.1.4 The following statements explain the process of diffusion.

(i) Molecules move from a region of lower concentration to a region of higher concentration.
(ii) Diffusion will continue until equilibrium is reached.
(iii) Diffusion is an active transport that needs energy.
(iv) Molecules move along the concentration gradient.

Choose the CORRECT combination:

A (i), (ii) and (iii)
B (i), (iii) and (iv)
C (i), (ii) and (iv)
D (ii) and (iv)

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1.1.5 Calculate the actual percentage of phosphorus in a bag of fertiliser marked 2 : 3 : 2 (21).

A 3 kg
B 9 kg
C 4,5 kg
D 12 kg

1.1.6 Fruit that develops from the ripened ovary and some other parts of the flower.

A Simple fruit
B Compound fruit
C Accessory fruit
D Multiple fruit

1.1.7 The following are natural vegetative propagation methods, except …

A rhizomes.
B bulbs.
C budding.
D corms.

1.1.8 Which ONE of the following is NOT a disadvantage of monoculture?

A High chances of crop total crop failure
B Provides an ideal environment for spread of diseases
C Only one type of machinery, knowledge and inputs are required
D Large amounts of pesticides are required

1.1.9 The following are biological control methods of weeds, except …

A natural enemies.
B systemic herbicides.
C use of other invertebrates.
D species specific insects.

1.1.10 The following are steps in physical soil survey analysis, except for …

A farm planning.
B digging soil pits.
C determining soil profile.
D determining physical and chemical properties. (10 x 2) (20)

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1.2 Choose a term/phrase from COLUMN B that matches a description in COLUMN A. Write only the letter (A–I) next to question numbers (1.2.1 to 1.2.5) in the ANSWER BOOK, for example 1.2.6 H.

COLUMN A		COLUMN B	
1.2.1	Green plants that produce their own food	A	Hypotonic
1.2.2	A solution with lower water potential	B	Heterotrophs
1.2.3	An example of a sucking pest	C	Cutworms
1.2.4	An example of synthetic fertiliser added to improve the nutritional status of soil	D	Hypertonic
1.2.5	Farming of marine organisms such as fish, especially for human consumption	E	Autotrophs
		F	Thrips
		G	Green manure
		H	Aquaculture
		I	Super phosphate

(5 x 2) (10)

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

1.3.1 The female reproductive organs of a flower

1.3.2 Physical or chemical treatment that weakens or softens the seed coat

1.3.3 Chemicals that are used to control weeds

1.3.4 The technique of altering the DNA of plants to create specific traits

1.3.5 The practice of growing different crops in succession on a piece of land to control weeds, pests and diseases (5 x 2) (10)

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1.4 Change the UNDERLINED WORD(S) in each of the following statements to make them TRUE. Write only the answer next to the question numbers (1.4.1 to 1.4.5) in the ANSWER BOOK.

1.4.1 Macro-elements are essential plant nutrients needed in small amounts.

1.4.2 Most ions reach the leaves of plants from the roots through the phloem.

1.4.3 The movement of water molecules from a region of lower to higher concentration is called diffusion.

1.4.4 Conventional tillage is an agricultural technique for growing crops without disturbing the soil through tillage.

1.4.5 Soil classification aims to produce a soil map that shows the different types of soil in a farming area. (5 x 1) (5)

TOTAL SECTION A: 45

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SECTION B

QUESTION 2: PLANT STUDIES (NUTRITION)

Start this question on a NEW page.

2.1 Photosynthesis is a very important process to plants, animals and to the environment.

2.1.1 State the role played by chlorophyll in the process of photosynthesis. (1)

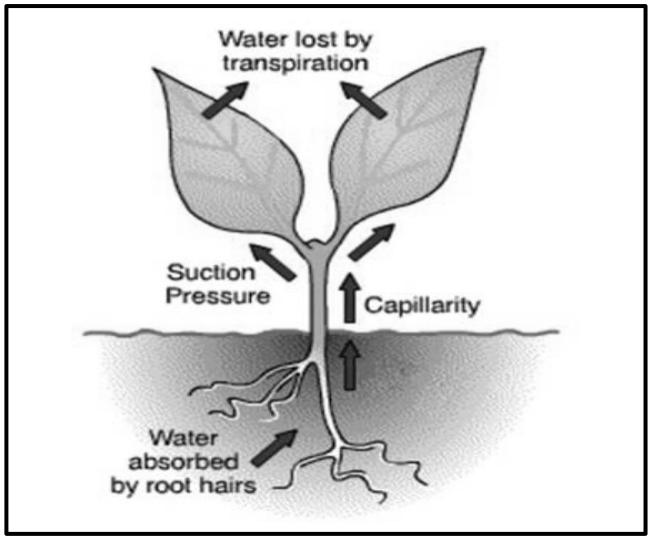
2.1.2 Define the *process of photosynthesis*. (2)

2.1.3 State TWO importance of the process of photosynthesis. (2)

2.1.4 Give TWO plant organs where the products of photosynthesis are stored. (2)

2.1.5 Suggest TWO measures farmers can take to optimise the process of photosynthesis. (2)

2.2 The picture below illustrates how water moves from soil to plants and to the atmosphere.



2.2.1 Suggest the mechanism through which roots absorb minerals against their concentration gradient. (1)

2.2.2 State TWO adaptation features of broad-leaved plants to reduce the rate of water loss. (2)

2.2.3 Supply THREE functions of water in plants. (3)

2.2.4 Define the term *translocation* in plants. (2)

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2.3 Plants need specific elements for healthy growth, metabolism and reproduction. Analyse the table below and answer the following questions.

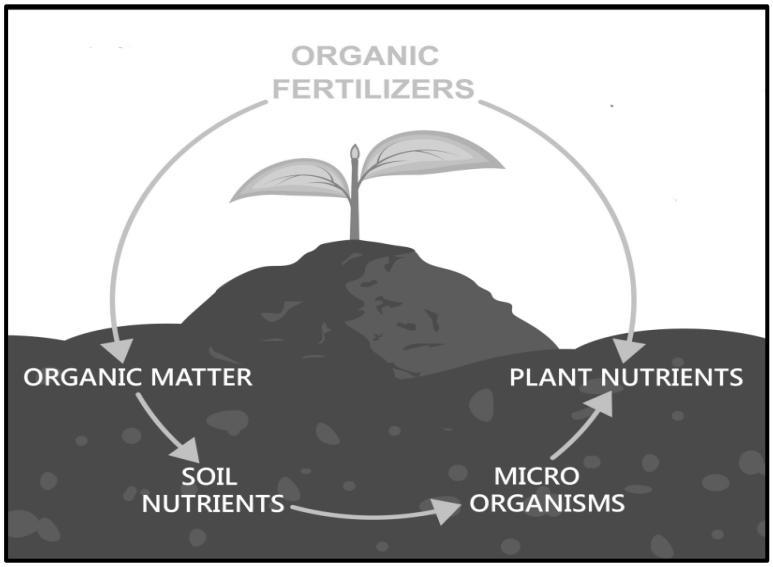
MINERAL	FORM IN WHICH IT IS ABSORBED BY PLANTS	MINERAL TYPE	DEFICIENCY SYMPTOM
Calcium	Ca^{2+}	**A**	Stunted growth
Potassium	**B**	Macro element	**C**
Zinc	**D**	**E**	Little leaf

2.3.1 Provide the labels for letters **A**–**E** to complete the table above. (5)

2.3.2 State TWO factors that affect the availability of minerals like nitrogen to plants. (2)

2.3.3 Give TWO methods farmers can use to determine the nutrient status of the soil. (2)

2.4 The picture below shows how organic fertilisers are made from excreta or animal organisms that have died.



2.4.1 Give ONE example of an organic fertiliser that farmers can apply to improve soil nutrients. (1)

2.4.2 State THREE physical benefits of organic fertilisers on the soil. (3)

2.4.3 Suggest TWO detrimental effects of continuous use of inorganic fertilisers on the environment. (2)

2.4.4 Provide THREE uses of gypsum to the soil. (3)

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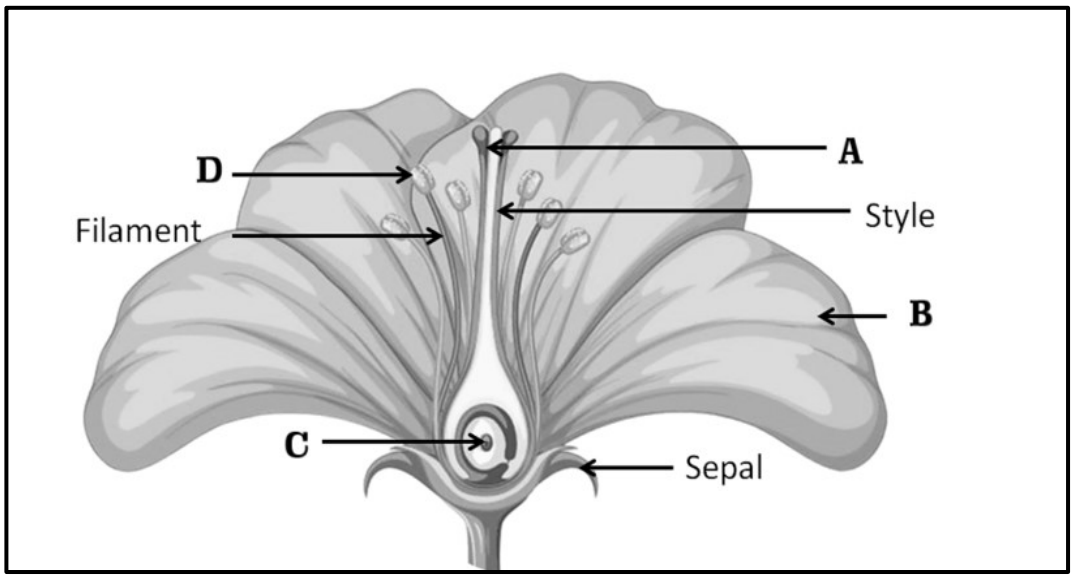
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QUESTION 3: PLANT REPRODUCTION AND PROTECTION

Start this question on a NEW page.

3.1 Study the diagram of a typical flower below and answer the questions that follow.



3.1.1 Identify flower parts **A**, **B** and **C**. (3)

3.1.2 State the function of part **D**. (1)

3.1.3 Deduce whether the flower above represents a unisexual or a bisexual flower. (1)

3.1.4 Motivate the answer to QUESTION 3.1.3 above. (1)

3.1.5 Name the process during which pollen grains are transferred from part **D** to part **A**. (1)

3.1.6 Give TWO examples of agents for the process described in QUESTION 3.1.5. (2)

3.2

Ablactation in plants occurs when plants drop many young flowers and fruitlets to reduce the amount of fruit set. This may occur when no <u>fertilisation</u> took place due to many other causes. If all flowers on an apple fruit tree form fruit, it will be too heavy for the tree to carry and the quality of the apples will be low.

3.2.1 State ONE advantage of ablactation to plants from the passage above. (1)

3.2.2 State TWO soil factors causing ablactation in plants. (2)

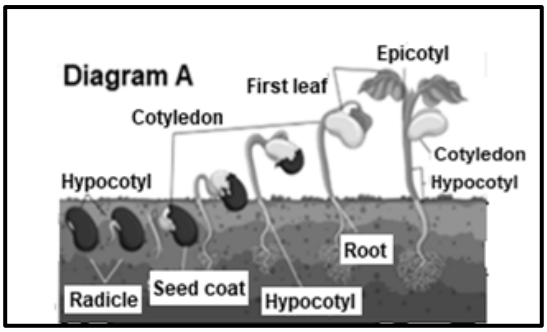
3.2.3 Classify apple fruits as fleshy simple fruit or accessory fruit. Support your answer. (2)

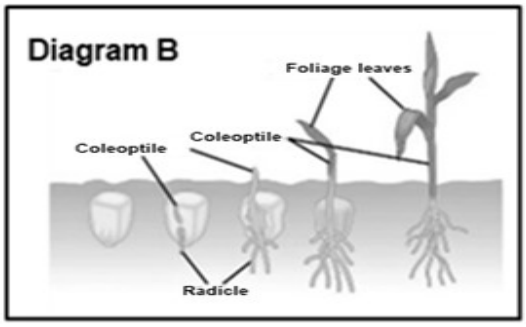
3.2.4 Define the underlined word in the passage above. (2)

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3.3 The diagrams below show the germination of a dicotyledonous and monocotyledonous plant.





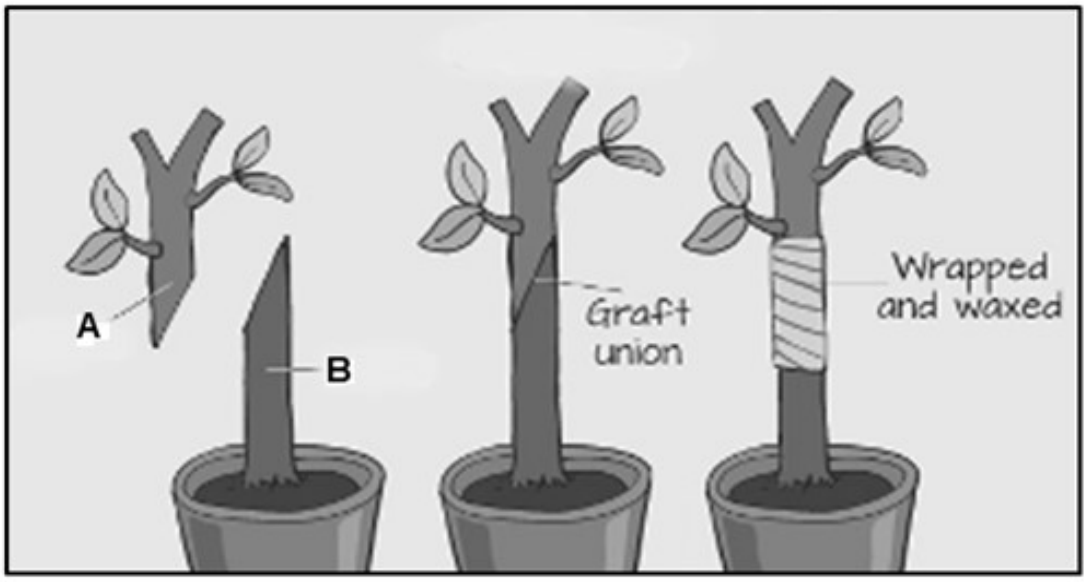
3.3.1 Identify the type of germination depicted in Diagram **A** and Diagram **B**. (2)

3.3.2 Describe the role played by cotyledons in Diagram **A** during seed germination. (2)

3.3.3 List TWO environmental conditions required for seed germination to be successful. (2)

3.3.4 Provide TWO methods that can be used to break seed dormancy of seed type in Diagram **B**. (2)

3.4 The diagrams below show a type of asexual propagation.



3.4.1 Identify the type of propagation illustrated above. (1)

3.4.2 Provide labels for **A** and **B** in the diagram above. (2)

3.4.3 State THREE disadvantages of the plant propagation identified in QUESTION 3.4.1 above. (3)

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3.5 Proper weed management and control of pests and diseases results in increased crop productivity.

3.5.1 State TWO mechanical weed control methods that farmers can apply. (2)

3.5.2 Supply the name given to chemicals used to control pests. (1)

3.5.3 Explain how the use of biotechnology can assist farmers to control pests and diseases. (2)

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QUESTION 4: OPTIMAL RESOURCE UTILISATION

Start this question on a NEW page.

4.1 Soil survey in agriculture helps farmers to determine the suitability of land for different agricultural activities.

4.1.1 Define the concept *soil survey*. (2)

4.1.2 Give TWO aims of soil survey in agriculture. (2)

4.1.3 List THREE physical characteristics of soil that can be collected from a soil profile test. (3)

4.2 Analyse the images below and answer the questions that follow.



4.2.1 Identify implement **1** and **2** above. (2)

4.2.2 Determine whether each of the implements **1** and **3** above is used for primary or secondary cultivation. (2)

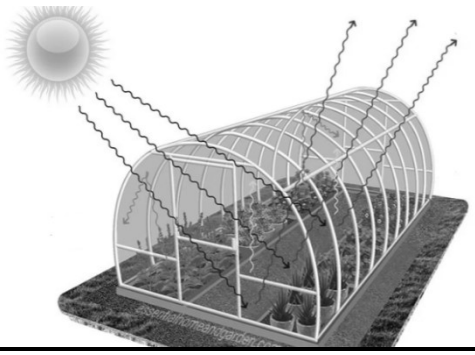
4.2.3 State the objective of secondary cultivation. (1)

4.2.4 Tabulate TWO advantages of conventional tillage and conservation tillage. (4)

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4.3

PICTURE A	PICTURE B
	

4.3.1 Name the structure in PICTURE **A**. (1)

4.3.2 Identify ONE material used to make the structure in PICTURE **A**. (1)

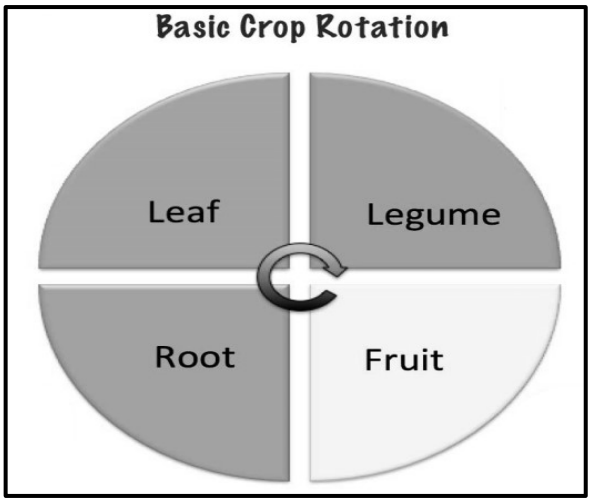
4.3.3 State TWO advantages of using the structure in PICTURE **A**. (2)

4.3.4 Indicate the plant growing technique in PICTURE **B**. (1)

4.3.5 Explain how the technique in PICTURE **B** operates. (2)

4.3.6 Suggest a reason why the technique in PICTURE **B** is not common to subsistence farming. (1)

4.4 The schematic diagram below shows crop rotation practice used by farmers.



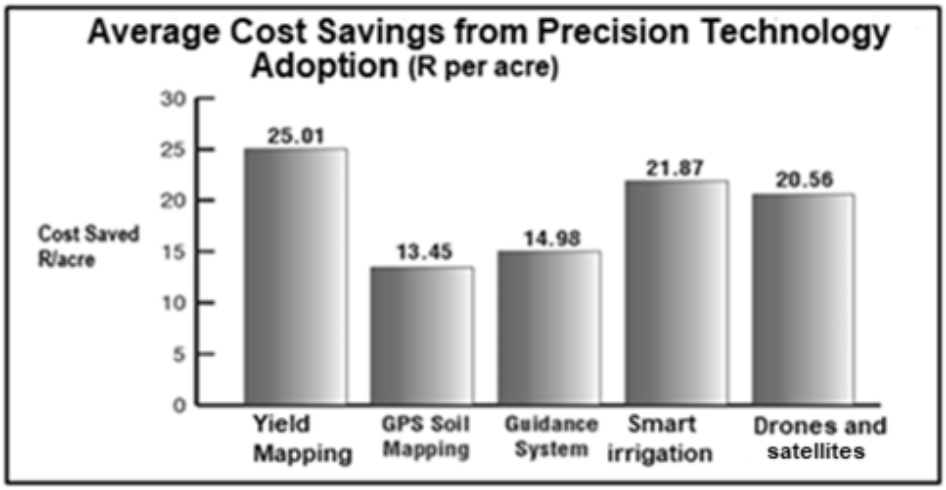
4.4.1 Suggest TWO advantages of crop rotation. (2)

4.4.2 Give a reason for including legume and root crop in the crop rotation program. (2)

4.4.3 Give TWO principles to consider when designing a crop rotation program. (2)

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4.5 The graph below shows how much farmers can save on the average cost of inputs per acre if they adopt various precision farming techniques.



4.5.1 Translate the data on the graph above to a table. (4)

4.5.2 Identify from the graph above the technology that saves more cost of inputs per acre. (1)

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TOTAL SECTION B: 105
GRAND TOTAL: 150

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