



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

AGRICULTURAL SCIENCE/P2

EXEMPLAR 2007

MARKS: 150

TIME: 2 hours

This question paper consists of 13 pages and a 1-page answer sheet.

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions in SECTION A and SECTION B.
2. SECTION A (QUESTION 1) must be answered on the attached ANSWER SHEET.
3. SECTION B (QUESTIONS 2 to 4) must be answered in the ANSWER BOOK.
4. Start each question of SECTION B on a NEW page.
5. Read ALL the questions carefully and answer only what is asked.
6. Number the answers correctly according to the numbering system used in this question paper.
7. Write neatly and legibly.

SECTION A**QUESTION 1**

1.1 Various options are provided as answers for the following questions. Choose the correct answer and make a cross (X) over the letter A - D next to the question number (1.1.1 - 1.1.10) on the attached answer sheet.

1.1.1 Which ONE of the following factors affects the rate of photosynthesis?

- A Soil water
- B Age of the plant
- C Soil colour
- D Soil structure

1.1.2 Plants absorb minerals in the form of ...

- A anions.
- B auxins.
- C atoms.
- D ions.

1.1.3 Water in plants is responsible for the ...

- A improvement of the quality of the crop.
- B improvement in the taste of the crop.
- C development of growth areas.
- D mechanical rigidity of cells.

1.1.4 Which ONE of the following statements is INCORRECT?

Soil is a growth medium for plants because it ...

- A supplies nutrients to plants.
- B supplies carbon dioxide to plants.
- C serves as a substrate for plants to anchor themselves.
- D supplies water to plants.

1.1.5 Which ONE of the following conditions does NOT pollute the environment?

- A The use of pesticides in too high concentrations
- B The unnecessary use of pesticides
- C Conventional cultivation
- D Overgrazing

- 1.1.6 A ... is used to measure soil moisture tension in soil.
- A monometer
 - B tensiometer
 - C nanometer
 - D pentameter
- 1.1.7 The system of crop production where a growth medium other than soil is used, is known as ...
- A hydroponics.
 - B aquaculture.
 - C viniculture.
 - D tunnel production.
- 1.1.8 The following cultivation practice is NOT beneficial to the optimal use of the soil:
- A Crop rotation
 - B Mulching
 - C Monoculture
 - D Intercropping
- 1.1.9 A change in the genetic characteristics of a plant is known as ...
- A runners.
 - B layering.
 - C cuttings.
 - D mutation.
- 1.1.10 Pollen is transferred to the stigma by the process of ...
- A pollination.
 - B germination.
 - C reproduction.
 - D selection.
- (10 x 2) (20)

1.2 In the table below, a statement and two answers are given. Decide whether the statement in COLUMN B relates to ONE, BOTH or NONE of the items in COLUMN A. Choose the correct answer and make a cross (X) over the appropriate block next to the question number (2.1.1 - 2.1.15) on the answer sheet.

EXAMPLE:

	COLUMN B
A: O-Horizon B: C-Horizon	Contains solid rock

ANSWER:

The statement refers to:			
ONLY A	ONLY B	A and B	NONE
	X		

	COLUMN B
1.2.1 A: No soil B: Vermiculite	Growers do not use soil media
1.2.2 A: Building costs B: Crop out of season	Disadvantage of growing crops in greenhouses
1.2.3 A: Ladybird B: Bee	Natural enemies to keep pest numbers down
1.2.4 A: Self-pollination B: Cross-pollination	Pollination by different plants of the same species
1.2.5 A: Micronutrients B: Trace elements	Elements that are needed in large quantities

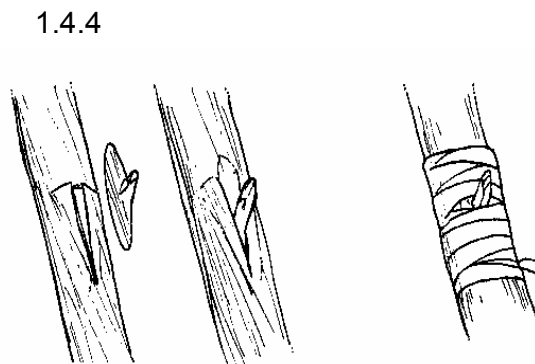
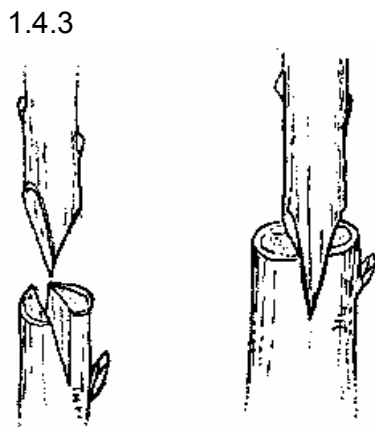
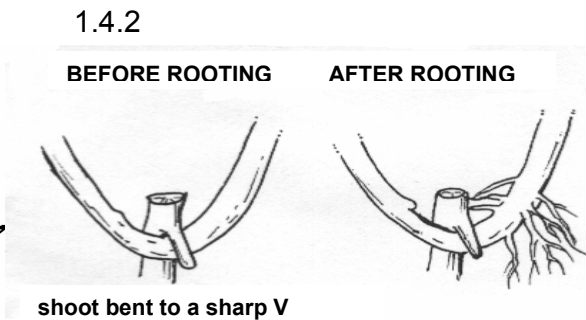
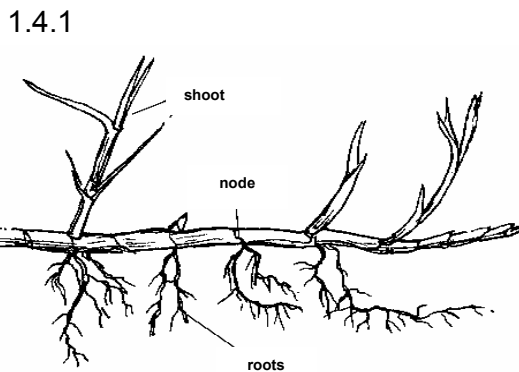
(5 x 2) (10)

1.3 Change the underlined word/term to correct each statement given below. Write the correct answer next to the question number (1.3.1 - 1.3.10) on the answer sheet.

- 1.3.1 The meiotic cell division takes place just after fertilisation.
- 1.3.2 Matrix pressure develops in a plant cell because of water uptake by the plant.
- 1.3.3 Physically modified crops are resistant to pests and diseases and thus reduce the need for chemical sprays.

- 1.3.4 International biotechnology is when the farmer brings together different control methods to optimise pest control.
- 1.3.5 A form of agriculture that relies on organic sources, amongst other practices, to create a naturally balanced ecosystem, is known as monoculture.
- 1.3.6 Flood irrigation can easily be used, as the water is delivered exactly where it is needed.
- 1.3.7 When a farmer practises mulching, it results in a decrease in water infiltration.
- 1.3.8 Veld management deals with the utilisation and conservation of trees to ensure maximum production.
- 1.3.9 The gynoecium represents the male sex organs. (10)
- 1.3.10 Organic fertilisers have been blamed for environmental damage, including the poisoning of birds and animals.

1.4 Identify the methods of asexual reproduction in the illustrations below. Write the correct answer next to the question number (1.4.1 - 1.4.5) on the attached answer sheet.



1.4.5



(5)

TOTAL SECTION A: 45

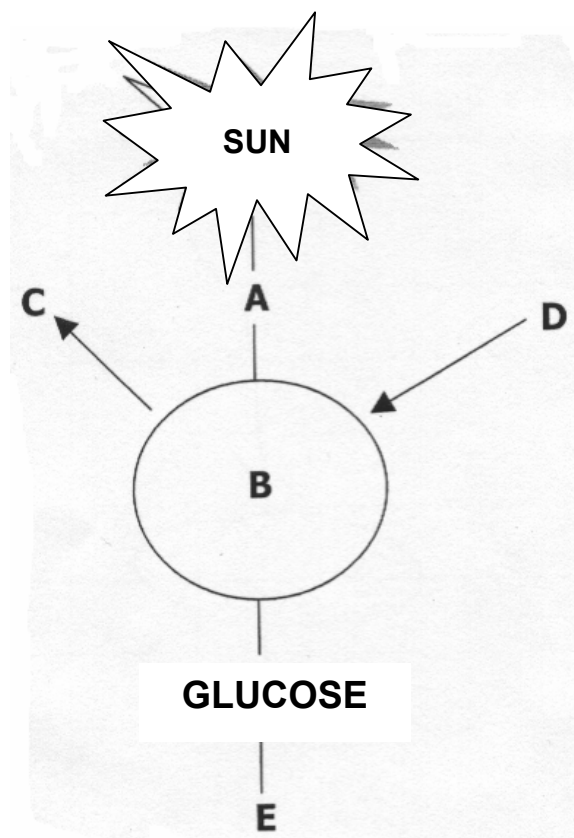
SECTION B

Start each question in this section on a NEW page in the answer book.

QUESTION 2: PLANT NUTRITION

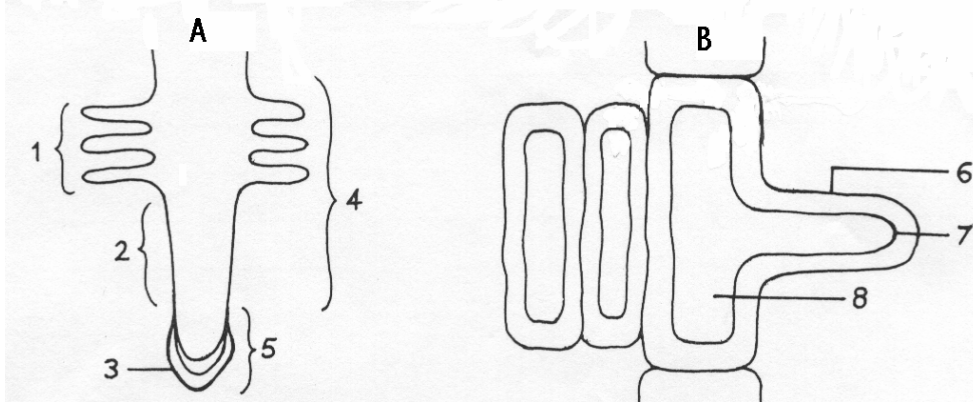
- 2.1 Read the following passage and study the illustration below. Answer the questions that follow:

Plants are the key to life on earth. All agricultural practices are based on plants in some way, whether it is involved in crop production or pastures for animals. The ability of plants to be self-sufficient in the production of their own feed, is an important aspect of crop production.



- 2.1.1 Give the definition for the illustrated process above. (3)
- 2.1.2 Identify the parts labelled A, B, C, D and E. (5)
- 2.1.3 Explain why this process is so important in animal production. (2)
- 2.1.4 List the requirements that will enhance this process. (4)

2.2 Refer to the diagrams below and answer the following questions:



2.2.1 What is the function of the following regions in the diagrams:

- (a) 1
 - (b) 5
 - (c) 8
- (3 x 2) (6)

2.2.2 Name THREE forces involved in the upward movement of water in the plant. (3)

2.3 Modern inorganic fertilisers are produced to deliver the precise amount of nutrients. Use the information on the bag of fertilisers below to answer the questions that follow:



2.3.1 Describe what the numbers 3:2:1 (25) stand for, as seen on the fertiliser bag. (4)

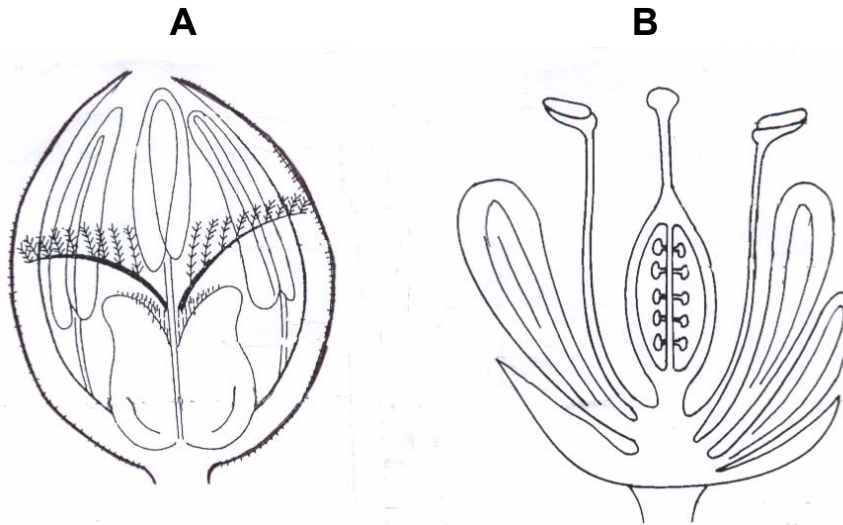
2.3.2 The numbers on the bag supply important information on the plant nutrients. Calculate the percentage quantity of each nutrient in this mixture. Show ALL calculations. (6)

2.3.3 If a farmer wants to apply 10 kg of potassium, how many kilograms of this mixture should he apply? (2)

[35]

QUESTION 3: PLANT REPRODUCTION

- 3.1 The diagrams below refer to the sexual reproduction of different crops used in crop production:



Answer the following questions:

- 3.1.1 Which diagram illustrates the following:
- A dicotyledonous flower
 - A monocotyledonous flower
- (2)
- 3.1.2 Give an appropriate example of an agricultural crop that fits the following illustrations:
- A
 - B
- (2)
- 3.1.3 Which ONE of the two flowers shows above adaptations for insect pollination? Explain your answer.
- (5)
- 3.1.4 Tabulate the morphological differences between illustration A and illustration B.
- (6)
- 3.2 Read the case study and answer the questions that follow:

Why do farmers plant Bt maize?

The use of Bt maize, which uses a bacterial gene to provide resistance to the stalk borer larvae, continues to increase globally. To date most genetically manipulated crops have delivered benefits primarily to farmers. The key result is that insect resistant Bt maize has production benefits for farmers, health advantages for humans and animals and reduces the impact of insecticide on the environment.

- 3.2.1 Identify THREE advantages that Bt maize has for the environment. (3)
- 3.2.2 Name TWO methods of cultivating genetically modified plants. (2)
- 3.2.3 Explain, in your own words, how genetically modified plants are created. (4)
- 3.2.4 Stipulate THREE public concerns about genetically modified plants. (3)

3.3 Farmers suffer great losses in production because of plant insects and diseases. The following table indicates the infestation rates identified at the beginning of the vegetative period of a crop, duration of infestation and potential loss in yield:

Yield loss (% of total yield)	Duration of infestation (weeks)	Infestation rates			
		1 larvae colony/ 10 000 plants	3 larvae colonies/ 10 000 plants	6 larvae colonies/ 10 000 plants	9 larvae colonies/ 10 000 plants
	1	0,01%	0,08%	0,25%	0,59%
	2 - 3	0,06%	0,65%	1,55%	4,88%
	3 - 4	0,28%	1,80%	9,05%	22,69%
	4 - 5	0,75%	3,95%	35,60%	79,85%
	5 and more	2,50%	12,50%	87,50%	100%

- 3.3.1 State the guidelines for pest control which you can deduct from this table? (2)
- 3.3.2 Give an outline of the economic feasibility of a control treatment. (2)
- 3.3.3 Draw a graph to indicate the rate of growth of the infestation where most colonies of infestation have attacked the crop. (Use the x-axis for time (weeks) and the y-axis for total yield loss.) (4)

[35]

QUESTION 4: OPTIMAL RESOURCE UTILISATION

4.1 Read the below and answer the following questions:

Mrs Mbuza and Mrs Gerard are neighbouring maize producers living in Polokwane. Mrs Mbuza uses conventional tillage whilst Mrs Gerard is using zero or no tillage to produce her maize. Each year Mrs Mbuza loses 8,9 tons of soil to erosion whilst Mrs Gerard only loses 2,4 tons.

4.1.1 Explain the loss of soil experienced by both farmers. (4)

4.1.2 Differentiate between *conventional tillage* and *zero/no tillage*. (4)

4.1.3 Which ONE of the two tillage practices will lead to the soil retaining more water? Motivate your answer. (4)

4.1.4 List TWO other cropping systems that can be used that are beneficial to the fertility status of the soil. (2)

4.2 Read the following and answer the questions that follow:

A small group of farmers in your area have invited you to their meeting to inform them about the basics of greenhouse farming and how it could improve their production capacity.

Prepare a presentation for these farmers under the following headings:

4.2.1 Basic principles of greenhouse production (4)

4.2.2 An alternative to greenhouse production (2)

4.3 Soil cultivation is an important aspect of farming. Provide a group of farmers with the FIVE aims of soil cultivation. (5)

- 4.4 Diagrams A and B show TWO different primary implements on a farm in South Africa. Briefly describe to a group of local farmers what they are used for.

DIAGRAM A



DIAGRAM B



(4)

- 4.5 When there is no rain, the farmer has to supply his plants with water. To do this correctly, he has to know how much water to apply. Name the TWO instruments that can assist him in this regard.

(2)

- 4.6 Subsistence and commercial farming still exist in the agricultural sector in South Africa. Compare the differences between *subsistence* and *commercial* farming.

(4)

[35]

TOTAL SECTION B: 105

GRAND TOTAL: 150

NAME/EXAMINATION NUMBER:

ANSWER SHEET

SECTION A

QUESTION 1

1.1.1	A	B	C	D
1.1.2	A	B	C	D
1.1.3	A	B	C	D
1.1.4	A	B	C	D
1.1.5	A	B	C	D
1.1.6	A	B	C	D
1.1.7	A	B	C	D
1.1.8	A	B	C	D
1.1.9	A	B	C	D
1.1.10	A	B	C	D

(10 x 2) (20)

1.3.1	_____
1.3.2	_____
1.3.3	_____
1.3.4	_____
1.3.5	_____
1.3.6	_____
1.3.7	_____
1.3.8	_____
1.3.9	_____
1.3.10	_____

(10)

	ONLY A	ONLY B	A + B	NONE
1.2.1				
1.2.2				
1.2.3				
1.2.4				
1.2.5				

(5 x 2) (10)

1.4.1	_____	(1)
1.4.2	_____	(1)
1.4.3	_____	(1)
1.4.4	_____	(1)
1.4.5	_____	(1)

TOTAL SECTION A: 45