



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATION - 2006

AGRICULTURAL SCIENCE PAPER 1

STANDARD GRADE

OCTOBER/NOVEMBER 2006

802-2/1E

AGRICULTURAL SCIENCE SG: Paper 1

MARKS: 150

TIME: 2 hours



802 2 1E

SG

This question paper consists of 8 pages.



INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. This question paper consists of TWO sections: SECTION A and SECTION B.
3. Answer ALL the questions in the agricultural science context in the ANSWER BOOK provided.
4. Start each question on a NEW page.
5. Number the answers as the questions are numbered.
6. Read the questions carefully and answer what is asked.
7. Write neatly and legibly.
8. Non-programmable calculators may be used.

SECTION A**QUESTION 1**

1.1 Various possible options are provided as answers for the following questions. Write only the letter (A – D) next to the question number (1.1.1 – 1.1.5) in the answer book, for example 1.1.6 D.

- 1.1.1 A soil horizon that is usually enriched with soluble salts leached from the upper horizon is ...
- A horizon R.
 - B horizon C.
 - C horizon A.
 - D horizon B.
- (2)
- 1.1.2 The type of soil water that the soil receives after heavy rainfall that penetrates deep into the soil under the influence of gravity:
- A Soaking water
 - B Hygroscopic water
 - C Capillary water
 - D Free water
- (2)
- 1.1.3 Potatoes are usually propagated by using ...
- A tubers.
 - B slips.
 - C runners.
 - D bulbs.
- (2)
- 1.1.4 In the ovule the ripe ovum is situated between the ...
- A auxiliary cells.
 - B endosperm cells.
 - C antipodal cells.
 - D vegetative nuclei.
- (2)
- 1.1.5 *Rhizobium* bacteria require ... for nitrogen fixation.
- A nitrogen
 - B copper
 - C zinc
 - D molybdenum
- (2)

- 1.2 Choose a/an item/word from COLUMN B that matches a description in COLUMN A. Write only the letter (A – H) next to the question number (1.2.1 – 1.2.5) in the answer book, for example 1.2.6 I.

COLUMN A		COLUMN B	
1.2.1	Berry fruit	A	pear
1.2.2	Dry fruit	B	raspberry
1.2.3	Accessory fruit	C	fig
1.2.4	Multiple fruit	D	nut
1.2.5	Compound fruit	E	grape
		F	peach
		G	apricot
		H	plum

(5 x 2)

(10)

- 1.3 Write the correct agricultural term for each of the following descriptions in the answer book next to the question number:

- 1.3.1 The chemical weathering process where a mineral reacts with water to form a new softer and more easily erosive mineral (2)
- 1.3.2 The organic matter in soil which occurs as colloidal material (2)
- 1.3.3 The force responsible for the upward movement of water through the micro pores of the soil (2)
- 1.3.4 The vertical exposure of the different soil layers (2)
- 1.3.5 The structure used for the cultivation of plants that has a transparent fibreglass roof that transmits sunlight for photosynthesis (2)

TOTAL SECTION A: 30

SECTION B**QUESTION 2: SOIL SCIENCE**

Answer this question on a NEW page.

- 2.1 Name the THREE basic groups into which soil particles are classified based on their diameter and indicate the diameter ranges of each class. (6)
- 2.2 Water found in soil can be lost in various ways. State FOUR of these ways in which water can be lost. (4)
- 2.3 State THREE factors that influence soil water retention capacity. (3)
- 2.4 Soil consists of TWO types of pore spaces. Name them. (2)
- 2.5 Briefly explain each of the following classifications of soil structure:
- 2.5.1 Platy structure (3)
- 2.5.2 Prism-like structure (3)
- 2.5.3 Blocky structure (3)
- 2.6 Explain how dark coloured soils will differ from light coloured soils in terms of the following:
- 2.6.1 Heat absorption (2)
- 2.6.2 Day and night temperatures (2)
- 2.7 You move along a newly constructed road and you observe clearly distinguishable soil horizons in the open soil profile.
- 2.7.1 What can you deduce in terms of the age of this soil? (1)
- 2.7.2 Identify the possible horizon at the bottom of this soil. (1)

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QUESTION 3: SOIL SCIENCE

Answer this question on a NEW page.

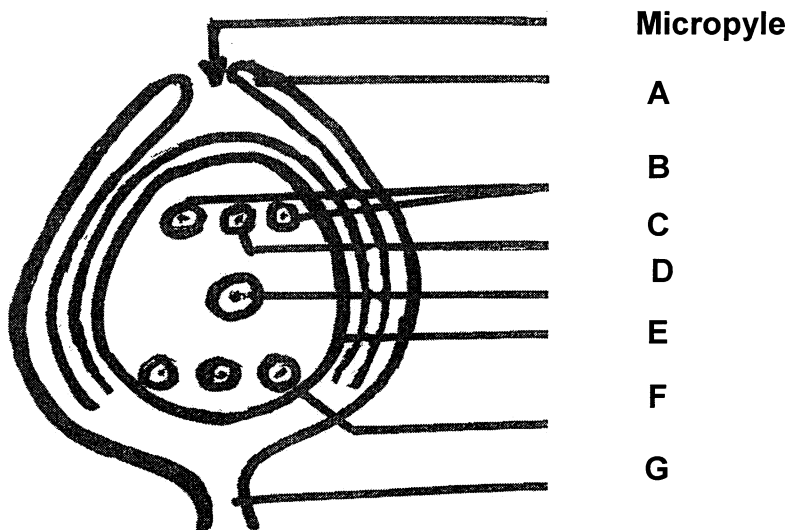
- 3.1 Name FIVE ways in which soil temperature could influence plant growth and crop production. (5)
- 3.2 Oxygen plays an important role in soil. State FIVE functions of oxygen in the soil. (5)
- 3.3 'Organic farming is a fast growing enterprise.' Describe FIVE ways in which organic matter in the soil influences physical properties of the soil. (5)
- 3.4 Give the sequence (procedure) for the classification of soil. (5)
- 3.5 Briefly explain FIVE characteristics of saline soils (white brack). (5)
- 3.6 Briefly explain how water influences weathering during freezing. (2)
- 3.7 In a simple analysis to determine soil reaction, a particular soil is found to have a pH value of more than 7. Indicate the THREE cations that could possibly be more dominant in this soil. (3)

[30]

QUESTION 4: PLANT REPRODUCTION

Answer this question on a NEW page.

4.1 Study the following diagram which represents the structure of an ovule and answer the questions that follow:



4.1.1 Name the parts labelled A to G. (7)

4.1.2 Indicate which of the above structures will develop to form the testa of the seed and give a function of the testa. (2)

4.1.3 Briefly explain the function of micropyle. (2)

4.2 Name TWO grafting techniques. (2)

4.3 Flowers and fruitlets from a peach tree sometimes fall on the ground. This is called abscission. State FOUR factors which may cause this condition. (4)

4.4 Differentiate between pollination and fertilisation in plant reproduction. (4)

4.5 Briefly explain how double fertilisation takes place in plants. (5)

4.6 What would you say is the aim of artificial cross-pollination in agricultural crop production? (1)

4.7 Define the term *budding* and give the main reason for this technique (method). (3)

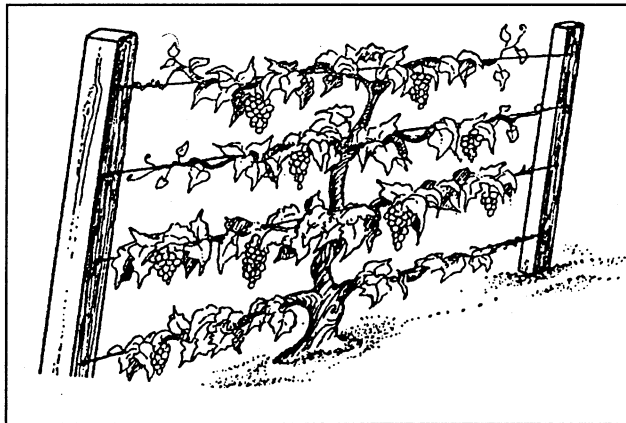
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QUESTION 5: PLANT NUTRITION

Answer this question on a NEW page.

- 5.1 State FIVE requirements for photosynthesis. (5)
- 5.2 State FIVE functions of water in plants. (5)
- 5.3 Study the following diagram which illustrates a technique (method) that is applied by farmers in plant production and answer the questions that follow:



- 5.3.1 Identify the technique illustrated above. (1)
- 5.3.2 What is the purpose of using this method? (1)
- 5.3.3 Give ONE example of a crop for which the technique illustrated above can be used. (1)
- 5.4 State FIVE functions of potassium in plants. (5)
- 5.5 Soils can be acidic, neutral or alkaline. State FIVE harmful effects of acid soil on plant growth. (5)
- 5.6 Roots absorb mineral ions in the soil either passively or actively. Discuss this uptake of nutritional elements by distinguishing between the following:
- 5.6.1 Passive ion uptake (3)
- 5.6.2 Active ion uptake (4)
- [30]**

TOTAL SECTION B: 120

GRAND TOTAL: 150