education

Department:
Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATION – 2008

AGRICULTURAL SCIENCE P1

STANDARD GRADE

MAY/JUNE 2008

MARKS: 150

TIME: 2 hours

This question paper consists of 8 pages.

INSTRUCTIONS AND INFORMATION

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

SECTION A

QUESTION 1

1.1 Various possible options are provided as answers to the following questions. Choose the answer and 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 blocky structure type ...

A usually settles on horizontal plates.
B resembles square cubes (block-shaped).
C has a flattened appearance.
D overlaps other angular blocky structures.

1.1.2 Clay soil has a ...

A very small water-holding capacity.
B very rapid water-movement potential.
C very small aeration ability.
D very large capacity to conduct heat.

1.1.3 If the cost of a ton of urea (46% N) is R552, then its unit price will be …

A R9.
B R10.
C R11.
D R12.

1.1.4 Nitrogen gas makes up …% of the gases in soil air.

A 0,03
B 79
C 20,7
D 20,9

1.1.5 When … clay erodes, the mineral illite is formed.

A muscovite
B montmorillonite
C biotite
D vermiculite (5 x 2) (10)

1.2 Write the agricultural term/phrase for each of the following descriptions next to the question number (1.2.1 – 1.2.5) in the ANSWER BOOK.

1.2.1 A state or condition in extremely dry soils where plants are unable to satisfy their transpiration requirements even during cool evenings

1.2.2 A physical soil characteristic which refers to individual soil particles which group together to form stable aggregates

1.2.3 The form in which nitrogen is most accessible to plants

1.2.4 The smallest soil particles with a diameter of less than 0,002 mm

1.2.5 A combination and succession of diagnostic horizons (5 x 2) (10)

1.3 Choose a word/term from COLUMN B that best matches a description in COLUMN A. Write only the letter (A – M) next to the question number (1.3.1 – 1.3.5) in the ANSWER BOOK, for example 1.3.6 N.

COLUMN A		COLUMN B	
1.3.1	Fruit that develops directly from the ovary	A	stigma
1.3.2	Attracts pollinating birds and insects	B	ovary
1.3.3	Male reproductive organ, which consists of a filament and an anther	C	starch-free fruit
		D	simple fruit
1.3.4	First organs to develop where they envelop and protect the flower bud	E	anther
1.3.5	The slender stalk that supports the stigma	F	petals
		G	ovum
		H	sepals
		I	pistil
		J	filament
		K	style
		L	stamen
		M	dry fruit

(10)

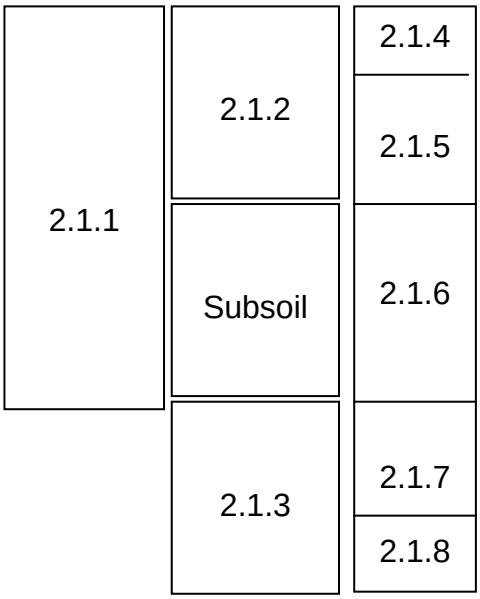
TOTAL SECTION A: 30

SECTION B

QUESTION 2: SOIL SCIENCE

Start this question on a NEW page.

2.1 The following diagram represents an ideal soil profile. Identify the sections numbered 2.1.1 to 2.1.8.



(8)

2.2 Briefly give the deductions that could be made from each of the following soil colours:

2.2.1 Grey (2)

2.2.2 Red (2)

2.2.3 Yellow (2)

2.3 Name FIVE soil characteristics that are influenced by the soil particle size. (5)

2.4 Suggest THREE measures that can be taken to reduce run-off. (3)

2.5 Name the type of soil water that is referred to in each of the following cases:

2.5.1 Water mainly found in the micro-pores (1)

2.5.2 Water found in the macro-pores (1)

2.6 Deduce THREE factors that will mainly influence the water-retention capacity of soil. (3)

2.7 Briefly explain how the prismatic structure type could be identified. (3)

[30]

QUESTION 3: SOIL SCIENCE

Start this question on a NEW page.

3.1 Name FIVE factors that influence the decomposition of organic matter. (5)

3.2 Give an explanation for the following phenomena occurring in the soil with regard to temperature:

3.2.1 When it is hot, wet soil heats up much more slowly than dry soil. (2)

3.2.2 Dark-coloured soil has a higher average temperature than to light-coloured soil. (2)

3.2.3 There is less variation between day and night temperatures in a soil with plant cover. (2)

3.2.4 Under cloudy conditions soil has a higher night temperature than under dry, clear weather conditions. (2)

3.3 Suggest the THREE characteristics of inorganic colloids. (3)

3.4 What are the FOUR effects of salinity in the soil? (4)

3.5 Soil series (soil families) are used in the binomial classification of soil. Indicate FIVE criteria that are used to describe them. (5)

3.6 How does organic matter influence the physical nature of soil? List FIVE ways. (5)
[30]

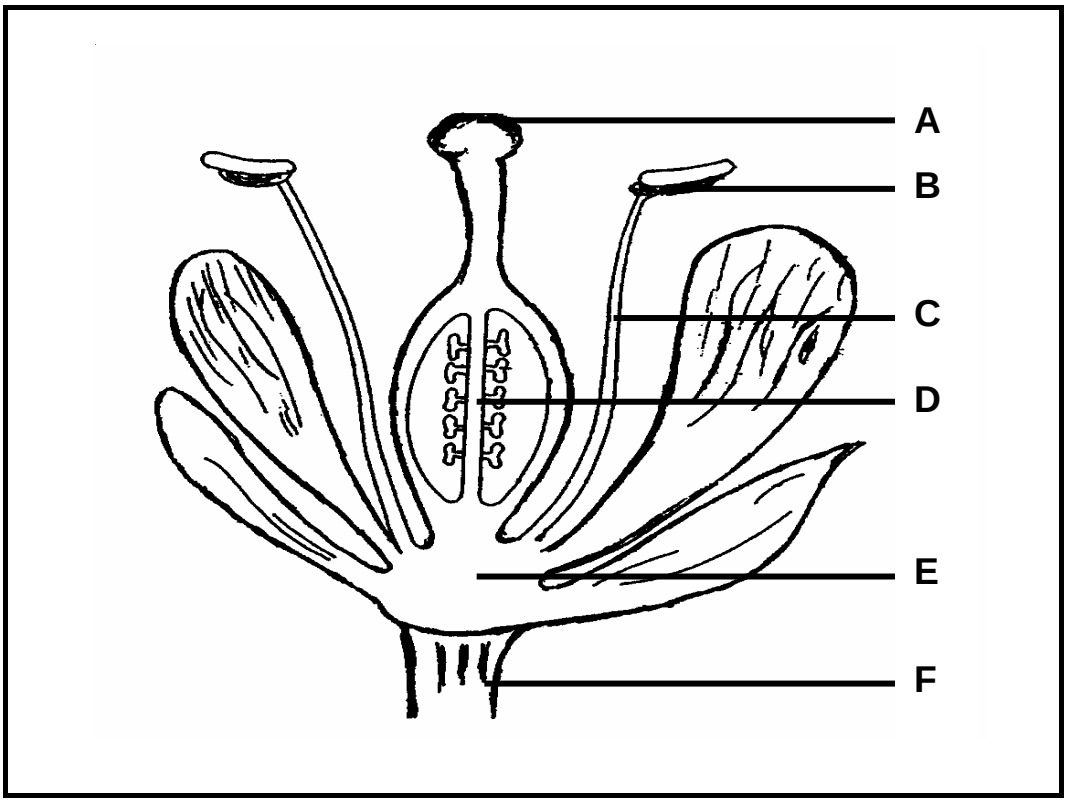
QUESTION 4: PLANT REPRODUCTION

Start this question on a NEW page.

4.1 Name FIVE asexual reproduction methods and in each case give ONE example of a plant that can be propagated through that method. (10)

4.2 Name FIVE factors that can cause ablactation of fruit trees. (5)

4.3 The diagram below represents the generalised structure of the flower of a dicotyledonous plant.



4.3.1 Illustrate in words in your ANSWER BOOK the parts on the diagram labelled A – F. (6)

4.3.2 Briefly explain the functions of the parts labelled E and F. (2)

4.4 Briefly differentiate between self-pollination and cross-pollination. (4)

4.5 Critically discuss how double fertilisation occurs in plant reproduction. (3)
[30]

QUESTION 5: PLANT NUTRITION

Start this question on a NEW page.

5.1 A tree was uprooted and fell on a lucerne pasture. The tree covered some lucerne plants for four weeks. The fallen tree was removed. The leaves of the lucerne plants underneath had turned yellow in colour.

5.1.1 What environmental factor/variable was eliminated (taken away) on the lucerne plants that turned yellow for a month? (1)

5.1.2 What caused the lucerne plants to turn yellow? (1)

5.1.3 Which biochemical process did the yellow leaves of the lucerne plant affect negatively? (1)

5.2 A fertiliser mixture 2:1:3 (20) is applied to the soil. Calculate the percentage N and K that it contains. Show ALL the calculations. (6)

5.3 Distinguish between passive and active ion absorption. (6)

5.4 Name the elements that cause the following deficiency symptoms:

5.4.1 Black heart in root crops (1)

5.4.2 Boiling water disease in wheat (1)

5.4.3 Green inverted V-pattern on leaf bases (1)

5.4.4 Saucer leaf in climbing plants (1)

5.5 List FOUR logical steps to reclaim brackish soil. (4)

5.6 Name FOUR factors that influence the composition of farm manure. (4)

5.7 Name THREE methods through which plants can be manipulated to increase photosynthesis. (3)
[30]

TOTAL SECTION B: 120
GRAND TOTAL: 150