



# education

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Department:  
Education  
**REPUBLIC OF SOUTH AFRICA**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 11**

**AGRICULTURAL SCIENCES P1**

**EXEMPLAR 2007**

**MEMORANDUM**

**This memorandum consists of 7 pages.**

## SECTION A / AFDELING A

### QUESTION 1.1 / VRAAG 1.1

1.1.1	<b>A</b>	<b>B</b>	<b>C</b>	<b>X</b>
1.1.2	<b>A</b>	<b>X</b>	<b>C</b>	<b>D</b>
1.1.3	<b>A</b>	<b>B</b>	<b>X</b>	<b>D</b>
1.1.4	<b>X</b>	<b>B</b>	<b>C</b>	<b>D</b>
1.1.5	<b>A</b>	<b>B</b>	<b>C</b>	<b>X</b>
1.1.6	<b>A</b>	<b>B</b>	<b>C</b>	<b>X</b>
1.1.7	<b>X</b>	<b>B</b>	<b>C</b>	<b>D</b>
1.1.8	<b>A</b>	<b>B</b>	<b>X</b>	<b>D</b>
1.1.9	<b>A</b>	<b>X</b>	<b>C</b>	<b>D</b>
1.1.10	<b>A</b>	<b>X</b>	<b>C</b>	<b>D</b>

### QUESTION 1.2 / VRAAG 1.2

1.2.1	<b>A</b>	<b>B</b>	<b>X</b>	<b>D</b>
1.2.2	<b>X</b>	<b>B</b>	<b>C</b>	<b>D</b>
1.2.3	<b>X</b>	<b>B</b>	<b>C</b>	<b>D</b>
1.2.4	<b>A</b>	<b>B</b>	<b>X</b>	<b>D</b>
1.2.5	<b>X</b>	<b>B</b>	<b>C</b>	<b>D</b>

### QUESTION 1.4 / VRAAG 1.4

1.4.1	displace other in sequence of liotrope series divalent ions like $\text{Ca}^{2+}$ replace two monovalent ions	(2)
1.4.2	Al $3^+$ Aluminium	(1)
1.4.3	a)hydrogen ions ( $\text{H}^+$ ) b)Calcium ions ( $\text{Ca}^{2+}$ ) Magnesium ions ( $\text{Mg}^{2+}$ )	(2)
		[5]

### QUESTION 1.3 / VRAAG 1.3

- 1.3.1 silt
- 1.3.2 Field water capacity
- 1.3.3 ions
- 1.3.4 Bacteria or protozoa
- 1.3.5 cellulose
- 1.3.6 autotrophic
- 1.3.7 Maltose/ disaccharide
- 1.3.8 Haematite / Iron
- 1.3.9 glycogen
- 1.3.10 physical/mechanical weathering

**START THIS QUESTION OF SECTION B ON A NEW PAGE**

## SECTION B

### QUESTION 2: BASIC CHEMISTRY.

- 2.1.1 Ionic bond-Transfer of one electron from the one atom to the other. (2)
- 2.1.2 Covalent bonds- Atoms share a pair of bonding electrons (2)  
**[4]**
- 2.2.1 A – Glucose  
B – Fat molecule  
C – Glycerol  
D – Amino acid  
E – Butanic acid (5)
- 2.2.2 Glycerol and butanic acid (alcohol) (2)
- 2.2.3 A (2)
- 2.2.4 Starch  
Glycogen  
Dextrin  
Cellulose (4)
- 2.2.5 D – Carboxyl group (4)  
E – Amino and Carboxyl group (4)  
**[17]**
- 2.3.1 A - Colloidal solution  
B – Suspension  
C - True solution (3)
- 2.3.2 C (2)
- 2.3.3 Tyndall effect (3)  
Light beam travel through the colloidal system path can be seen clearly with out deflection of light. (2)
- 2.3.4 B
- 2.3.5 Hydrochloric acid will dissociate in water  
 $H^+$  ions attaches to negative pole of  $H_2O$  Hydrated cations  $H_3O^+$  and  $H^+$  ions bind colloids – flocculation take place (4)  
**[35]**

### QUESTION 3: SOIL SCIENCE: Classification, Profiles and properties

3.1.1 I. O-horizon  
II. A- horizon  
III. B- horizon  
IV. C- horizon (4)

3.1.2 Illuvial-Mineral salts are washed in or carried from the O/A horizon to the B-horizon (2)

Eluvial - Export of soil minerals are washed out from the A horizon in to the B horizon. (2)

3.1.3

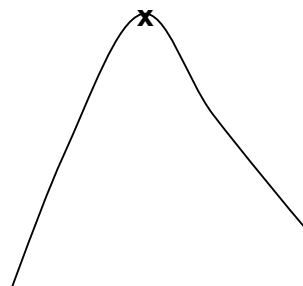
- climate
- vegetation
- topography
- man and his activities
- age (four only) (4)

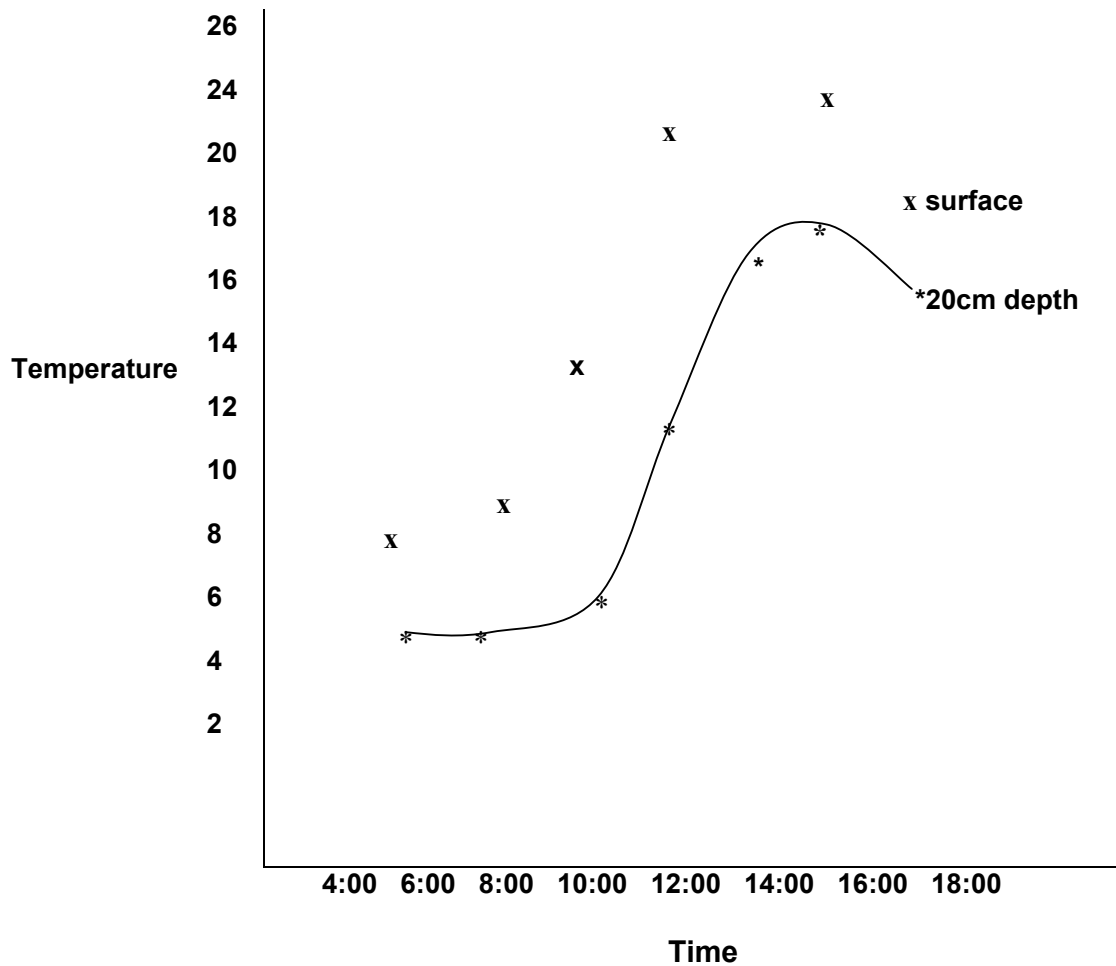
3.1.4

- occurs usually at the surface
- developed through accumulation of organic matter
- mixed with mineral fraction (3)

3.1.5 Irrigation –structural development for water capacity  
Drainage- soil forms  
Chemical adjustments- soil samples  
Soil preparation- creates favourable physical conditions. for germination  
Crop adaptation- better adapted under specific conditions. (2)

3.2.1





Use the following rubric to mark this question:

CRITERIA	INDICATORS		
	<b>Use of space</b>	Not in proportion, incorrect size and wrong scale. 0	In perfect proportion or correct size or correct scale 1
<b>Correctness</b>	Not a lines graph, incorrect values and no headings 0	Line graph or correct headings. 1	Line graph and correct values and correct headings. 2
<b>Neatness</b>	No neat lines and did not use a ruler for lines and no measured distances 0	Neatly drawn lines or used a ruler for lines or measured distances. 1	Neatly draw lines and used a ruler for lines and measured distances. 2
<b>TOTAL</b>			

(6)

3.2.2 Surface-14:00  
20 cm depth-16:00

(2)

- 3.2.3
- Daily variation in the soil temperatures decreases with increase in depth in the soil (2)
  - Minerals –higher heat conductivity as air (1)
  - The denser the particles are packed , the less air there is, (1)
  - The more heat conducted to the deeper layers of soil (1)
  - Moist air will therefore heat up much slower than dry so (1)

- 3.2.4
- Day and night temperature variation will be reduced
  - the denser the plant cover, the less radiation /heat energy will be received by the soil,
  - less heat will be lost during the night due to radiation
  - Vegetation acts as a buffer to temperature variation in the soil (4)

**[35]**

**QUESTION 4: SOIL SCIENCE: Chemical, Colloidal properties and soil microbiology.**

- 4.1.1 a. Clay (2)  
b. Sand (2)
- 4.1.2
- Darker in colour becomes warmer
  - Promoted a crumb structure
  - Water absorption improved
  - Water holding capacity is improved
  - Well aerated and well drained,
  - Easily cultivated
  - Does not become compacted
  - Less water and wind erosion
- (8)
- 4.1.3
- Kaolinite
  - Montmorillonite
  - Illite
  - Vermiculite
  - Chloride
- (4)
- 4.2.1 Soil flora
- protozoa
  - bacteria
  - fungi
- Soil fauna
- earthworms
  - ants
  - termites
- (6)
- 4.2.3
- nitrogen
  - sulphate
- (2)
- 4.2.4
- Decomposition of plant and animal residues
  - Liberation of nutrients
  - Liberation of carbon dioxide
  - Improvement of soil structure
  - Transformation of other essential mineral elements (any two) (2)
- 4.3.1 Alkalinity (Black brack)
- Sodium carbonate
- Salinity (White brack)
- Chlorides and Sulphates of sodium and calcium (2)
- 4.3.2
- Salts can be toxic to plants
  - Soil surface becomes powdery
  - Causes plasmolysis in plant cells (3)

- 4.3.3
- Absorbs water with difficulty
  - Poorly drained and aerated
  - Difficult to cultivate
  - Usually cold

(4)

**[35]**

**TOTAL SECTION B: 105**  
**TOTAL PAPER: 150**