Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2015

AGRICULTURAL SCIENCES P1 MEMORANDUM

MARKS: **150**

This memorandum consists of 6 pages.

SECTION A

QUESTION 1

1.1 **MULTIPLE-CHOICE QUESTIONS**

1.1.1 C √√
1.1.2 C √√
1.1.3 D √√
1.1.4 B √√
1.1.5 A √√
1.1.6 D √√
1.1.7 C √√
1.1.8 A √√
1.1.9 B √√
1.1.10 A √√ (10 x (20)

1.2 **COLUMN A/COLUMN B**

1.2.1 B √√
1.2.2 A √√
1.2.3 B √√
1.2.4 Both A and B √√
1.2.5 None √√ (5 x 2) (10)

1.3 **ONE WORD/TERM**

1.3.1 Molecule √√
1.3.2 Solubilisation √√
1.3.3 Saturation point √√
1.3.4 Soil imbalances √√
1.3.5 Platy √√ (5 x 2) (10)

1.4 **CHANGE THE UNDERLINED WORDS**

1.4.1 Polysaccharide √
1.4.2 Isomers √
1.4.3 Trans-amination √
1.4.4 Non-homogeneous √
1.4.5 Exchange capacity √ (5 x 1) (5)

TOTAL SECTION A: 45

SECTION B

QUESTION 2: BASIC AGRICULTURAL CHEMISTRY

2.1 2.1.1 (a) B √ (1)
(b) C √ (1)
(c) A √ (1)
(d) D √ (1)

2.1.2 Its burning produces a greenhouse gas √ which contributes to global warming √ (2)

2.1.3 It produces fewer √ air pollutants than petrol or diesel √ (2)

2.1.4 B – Hydroxyl/OH √
C – Carboxyl/COOH √ (2)

2.2 2.2.1 Name – Sodium chloride √
Formula – NaCl √ (2)

2.2.2 Ionic bond √ (1)

2.2.3
- It was used as a preservative to stop bacteria in food √
- Used for the treatment of skins and hides √
- To enhance flavour √ (3)

2.3 2.3.1

Acid	Base
Donates H+ ion when reacting with water √	Accepts H+ ion when dissolves in water √
Taste sour √	Taste bitter √
High concentration of hydrogen ion √	High concentration of hydroxide ion (OH) √
Turns litmus paper red √	Turns litmus paper blue √ (Any 2 x 2)

(4)

2.3.2 Neutralisation √ (1)

2.3.3
- Water √
- Salt √ (2)

2.4 2.4.1 Amino acid √ (1)

2.4.2 (a) B √ (1)
(b) A √ (1)

2.4.3 Condensation √ (1)

2.4.4
- Needed for growth and repair worn out tissues √
- For the production of hormones and enzymes √
- They produce antibodies in animals √
- They are involved in the process of cell signalling √
- They transport other substances in the body √ (Any 3) (3)

2.5 2.5.1 Fructose √ (1)
2.5.2 Galactose √ (1)
2.5.3 Sucrose √ (1)
2.5.4 Lignin √ (1)
2.5.5 Cellulose √ (1)

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QUESTION 3: SOIL SCIENCE

3.1 3.1.1 Farm B √ (1)

3.1.2
- Grey colour is a sign of water logging √
- Texture is clayey with micro-pores which limit water movement √ (2)

3.1.3 Farm A √ (1)

3.1.4
- Increased soil depth√ to encourage a well-established root system √
- Crumb structure √ ideal for soil cultivation √ (4)

3.1.5
- Favourable porosity and aeration √
- No soil compaction/reduced soil crusting √
- Improved root penetration √
- Reduced soil erosion √
- Improved emergence of seedlings √
- Greater water infiltration, retention and availability √
- Improved biological activity √ (Any 3) (3)

3.2 3.2.1 (a) Soil depth – pore space decreases with the increase in soil depth √ (1)

(b) Soil cultivation – soil which is constantly cultivated have a lowered pore space √ (1)

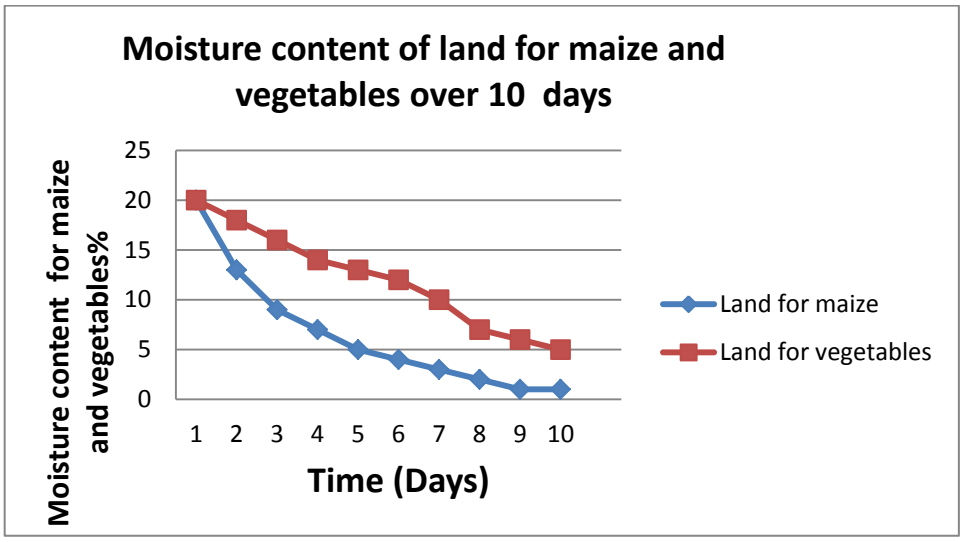
3.2.2
- Soil texture √
- Soil structure √ (2)

3.3 3.3.1 Dark/black √ (1)

3.3.2 Red √ (1)

3.3.3 Light √ (1)

3.4 3.4.1



Marking graph with the following checklist		
Criteria	**Yes : 1 mark**	**No : 0 mark**
1. Line graph	1	0
2. Y-axis labelled (with units)	1	0
3. X-axis labelled	1	0
4. Points correctly plotted	1	0
5. Correct heading	1	0
6. Key	1	0

(6)

3.4.2
- Ground cover/mulch √
- Wind breakers √
- Minimum tillage √
- Application of organic matter √ (Any 3) (3)

3.5 3.5.1 Radiation and reflection of sun's energy √ (1)

3.5.2 (a) Under moist and cloudy conditions, sun rays which are reflected up from the land√ will be reflected back down to the earth again √ (2)

(b) Light coloured soils reflect much more light and heat √ and dark coloured soils absorb more light √ (2)

3.5.3
- Soil microbes are activated √
- Seeds germinate faster√
- Optimum plant growth and production √ (3)

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QUESTION 4: SOIL SCIENCE

4.1 4.1.1
- The rock expands and contract leading to physical weathering. √
- Small pieces of rocks formed C-horizon. √
- Weathered rock undergo chemical weathering to form soil which become the medium for vegetation to grow. √
- Through the process of littering, plants will drop leaves and twigs onto soil to form O-horizon. √
- Micro-organisms convert organic debris on the soil through the process of humification. √
- A-horizon is formed. √ (6)

4.1.2 Removal of particles due to leaching/low clay content/poor in organic matter √ (1)

4.1.3
- Accumulation of organic matter √
- Accumulation of clay √
- Accumulation of minerals √ (3)

4.2 4.2.1
- Demarcate master horizons √
- Identify diagnostic horizons √
- Establish the soil form √
- Identify the series characteristics √
- Determine the soil series √ (5)

4.2.2
- For optimal utilisation of a country's natural resources √
- For scientific planning of a farm √
- The development of new regions √
- For valuation of soil √ (Any 2) (2)

4.3 4.3.1 (a) K^+ √ and Na^+ √ (2)
(b) H^+ √ and Al^{+3} √ (2)
(c) Ca^{+2} √ and Mg^{+2} √ (2)

4.3.2
- Toxic quantities of aluminium stops the root growth √
- Phosphorus become fixated √
- Molybdenum become less available √
- Exchangeable calcium and magnesium ion is small √ (Any 2) (2)

4.3.3 Add agricultural lime/$CaCO_3$ √ (1)

4.4 4.4.1
1 Photosynthesis √
3 Feeding √
4 Respiration √
5 Decomposition √
6 Combustion √ (5)

4.4.2 Bacteria √ Fungi √ (2)

4.4.3
- Soil moisture √
- Mineral nutrients √
- Soil air √
- Optimum temperature √
- Optimum pH √ (Any 2) (2)

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TOTAL SECTION B: 105
GRAND TOTAL: 150