



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2013

**AGRICULTURAL SCIENCES P1
MEMORANDUM**

MARKS: 150

This memorandum consists of 8 pages.

ANSWER SHEET**AGRICULTURAL SCIENCES P1****NAME AND SURNAME:** _____**SECTION A****QUESTION 1.1**

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)

QUESTION 1.2

	ONLY A	ONLY B	BOTH A and B	None
1.2.1	A	B	C	D
1.2.2	A	B	C	D
1.2.3	A	B	C	D
1.2.4	A	B	C	D
1.2.5	A	B	C	D

(5 x 2) (10)

QUESTION 1.3

1.3.1	Radioactive ✓✓
1.3.2	Saturation point ✓✓
1.3.3	Lignin ✓✓
1.3.4	Hydrolysis ✓✓
1.3.5	Compaction ✓✓

(5 x 2) (10)

QUESTION 1.4

1.4.1	Protons ✓
1.4.2	Liquid ✓
1.4.3	Electrostatic ✓
1.4.4	Mineralisation ✓
1.4.5	Evaporation ✓

(5 x 1) (5)

45

SECTION B

QUESTION 2

2.1 2.1.1 Biofuel can be used to make oilcake meal for livestock. ✓ (1)

2.1.2 Rural and small scale farmers can benefit from higher crop prices and from the value added products. ✓ (Any 1) (1)

2.1.3 Less pollution and reduction of the greenhouse effect as biofuel crops use up carbon dioxide. ✓ (Any 1) (1)

2.1.4 It is a renewable source of energy and limits the pollution of the environment. ✓ (1)

2.2 2.2.1 Hydrogen ✓ (1)

2.2.2 Noble gases ✓
Examples are helium, ✓ neon, ✓ argon, ✓ krypton, ✓ xenon ✓ or radon ✓ (Any 2 gases) (3)

2.2.3

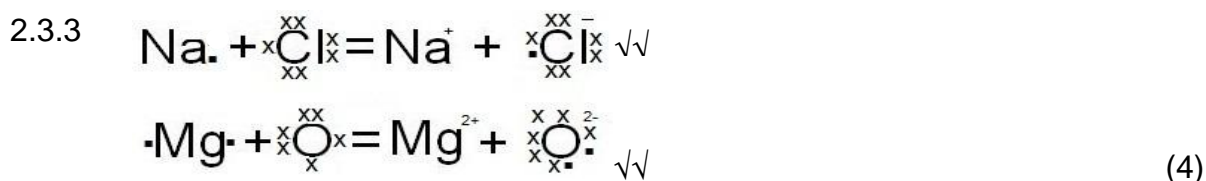
ELEMENT	VALENCE ELECTRONS	ATOMIC NUMBER	MASS NUMBER
Magnesium	2 ✓	12 ✓	24,31 ✓
Sulphur	6 ✓	16 ✓	32,06 ✓

(6)

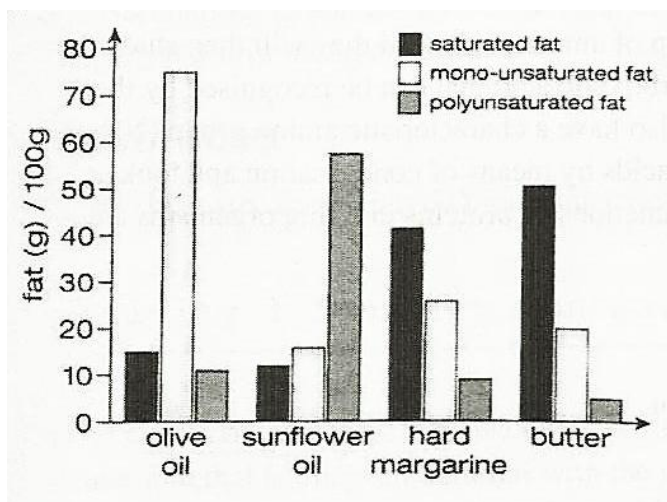
2.3 2.3.1 A = Covalent bond ✓
B = Ionic bond/Electron transfer ✓ (2)

2.3.2 Covalent bond is when the valence electrons are shared between atoms. ✓

Ionic bonding is when one atom gain or lose a valence electron from a different atom. ✓ (2)



2.4 2.4.1



Criteria to mark:	
Graph heading/caption	1 ✓
Correct graph type drawn	1 ✓
Labelled x-axis and y-axis	1 ✓
Correct plotting/accuracy	1 ✓
Correct scale	1 ✓
Key/legend	1 ✓

(6)

2.4.2 Saturated fats have only single bonds between the carbon atoms in fatty acids. ✓

Unsaturated fats have one or more double bonds between atoms in a fatty acid. ✓

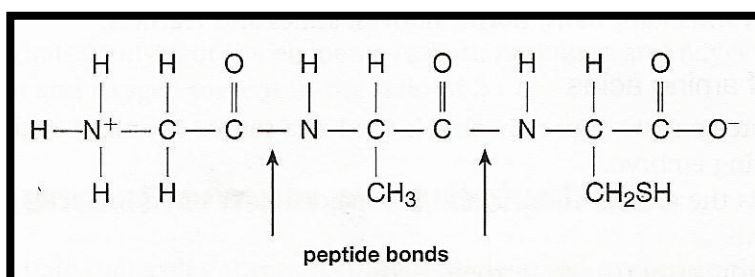
(2)

- 2.4.3
- Structural material that is part of the cell membrane ✓
 - Storage of seeds ✓
 - Energy reserves ✓
 - Source of water ✓
 - Insulation ✓
 - Protection ✓
 - Absorption of vitamins ✓
 - Waterproofing ✓

(Any 2)

(2)

2.5 2.5.1



✓✓

(2)

2.5.2 Polypeptides are the simplest types of proteins which consist of long chains of amino acids. ✓

(1)
[35]

QUESTION 3

3.1 3.1.1 Total weight = 1 700 g + 1 200 g + 900 g
= 3 800 g ✓

$$\text{Percentage sand} = \frac{1\,700\text{ g} \times 100}{3\,800\text{ g}} \checkmark$$

$$= 44,7\% \checkmark \quad (3)$$

- 3.1.2
- Field method ✓
 - Texture diagram of RSA ✓ (2)

- 3.1.3 To ensure appropriate management option of soil. ✓
- To decide a crop that should be cultivated on that land. ✓ (Any 1) (1)

- 3.2. 3.2.1
- A = Platy/flattened structure ✓
 - B = Single grain/amorphous structure ✓
 - C = Columnar structure ✓
 - D = Prismatic structure/prism like ✓
 - E = Blocky structure/angular/sub-angular ✓
 - F = Granular structure/spheroid/crumb ✓ (6)

- 3.2.2
- Soil textures especially the clay content ✓
 - Activity of soil mycorrhizae, earthworm, and other micro-organisms ✓
 - Organic content of soil ✓
 - Soil moisture ✓
 - The freezing/thawing cycle ✓
 - Cultivation ✓
 - Soil compaction ✓ (Any 2) (2)

- 3.2.3
- Minimum tillage ✓
 - Mulching and residue management ✓
 - Manuring ✓
 - Compost ✓
 - Fertiliser and nutrients ✓
 - Avoiding tillage when soil is too wet ✓
 - Cultivating early and use herbicides only where necessary ✓
 - Crop rotation ✓
 - Planting cover crops ✓
 - Agroforestry (inclusion of legumes) ✓
 - Rotational grazing (Any 2) (2)

- 3.3 3.3.1 E ✓ (1)
 3.3.2 B ✓ (1)
 3.3.3 O ✓ (1)
 3.3.4 A ✓ (1)
 3.3.5 C ✓ (1)
 3.3.6 R ✓ (1)



- 3.4.2
 - Carbon dioxide combines with soil water to form a weak carbonic acid. ✓
 - Helps to dissolve rocks and minerals to form soil. ✓
 - Plants nutrients are released in a soluble form. ✓
 - Reacts with inaccessible compounds in the soil and make them accessible to plant roots. ✓ (Any 3) (3)

3.5 3.5.1	DARK COLOURED SOIL	LIGHT COLOURED SOIL
	Indicates high fertility ✓	Indicates low fertility ✓
	More ion compounds ✓	Less or no ion compounds ✓
	Warm type of soil ✓	Varies with temperature ✓
	Suitable for any type of crop ✓	Only deep rooted crops can grow well ✓
	High percentage of organic matter ✓	Low percentage of organic matter ✓
(Any 4) (4)		

3.6.1 Bulk density = $\frac{\text{Mass of soil sample}}{\text{Total volume of soil sample}} \checkmark$

$$= \frac{560 \text{ g}}{75 \text{ cm}^3} \checkmark$$

$$= 7,47 \text{ g/cm}^3 \checkmark \quad (3)$$

- 3.6.2
 - Volume of pore space ✓
 - Volume of solid particles ✓
 - Compaction of soil particles ✓
 - Presence of organic matter ✓ (Any 1) (1)

[35]

QUESTION 4: SOIL SCIENCE

- 4.1 4.1.1 Nitrification/Denitrification ✓ (1)
- 4.1.2 Mineralisation/Ammonification ✓ (1)
- 4.1.3 Assimilation ✓ (1)
- 4.1.4 When lightning strikes, nitrogen in the atmosphere split and combine with oxygen to form nitrogen oxide. ✓ The nitrogen oxide dissolves in rainwater to form nitrates. ✓ Some of the nitrate rich rain drops fall into water and stimulates the growth of algae which makes water to turn green in colour. ✓ (Any 2) (2)
- 4.1.5 Nitrification is the microbial conversion of ammonium to nitrates. ✓ Denitrification is microbial conversion of nitrate to nitrogen gas. ✓ (2)
- 4.2 4.2.1 25 cm ✓ (1)
- 4.2.2 At 1 cm depth fluctuation between day and night is very high. ✓ At 10 cm depth the fluctuation between day and night is very low. ✓ (2)
- 4.2.3 Variation in soil temperatures decreases with an increase in soil depth. ✓ Mineral soil particles have higher heat conductivity than soil air, therefore, the more densely the soil particles are packed, the more heat is conducted to the deep layers of soil. ✓ (2)
- 4.2.4
- Orientation of the land ✓
 - Soil water content ✓
 - Radiation and the reflection of the sun's rays ✓
 - Vegetation/ground cover ✓ (Any 3) (3)

4.3	Human activities increases the organic matter on soil ✓	Human activities decreasing the organic matter content on soil ✓
	Controlled grazing ✓	Overgrazing ✓
	Cover or green manure crops ✓	No vegetation cover ✓
	Returning crop residue to the field ✓	Removal of crop residues in field ✓
	Conservation tillage ✓	Intensive tillage ✓
	Surface mulching ✓	Burning of vegetation ✓
	High plant productivity ✓	Low plant productivity ✓
	Application of compost and manure ✓	Application of inorganic material only ✓
	Low temperatures and shading ✓	High temperatures and exposure to the sun ✓
	Appropriate nitrogen gas level ✓	Excessive inorganic nitrogen gas ✓

(Any 3) (6)

- 4.4 4.4.1
- Valuation of the farm ✓
 - Optimal utilisation of the land ✓
 - Homogenous production units ✓
 - Choice of crop ✓
 - Planning of farm activities ✓
 - Allocation of land ✓
 - Regional planning and mapping ✓
- (Any 4) (4)

- 4.4.2
- Dig the soil profile or clean an existing soil profile ✓
 - Demarcate master horizon ✓
 - Identify diagnostic horizon ✓
 - Establishment of soil form ✓
 - Identify the series characteristic of soil ✓
 - Determine soil series ✓
- (6)

- 4.5 4.5.1
- Collect household material such as dead leaves, branches, kitchen waste, grass cuttings, papers and cardboards. ✓
 - Dig a hole that is 1 meter deep and 2 meters wide. ✓
 - Bring the organic material you have collected at home to the hole. ✓
 - Cut the organic material into pieces and add layer of the material to the compost hole. ✓
 - Add a little water if needed and make a heap which will be ready in three weeks' time. ✓
- (Any 4) (4)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150