



Education and Sports Development

Department of Education and Sports Development
Department van Onderwys en Sport Ontwikkeling
Lefapha la Thuto le Tlhabololo ya Metshameko
NORTH WEST PROVINCE

PROVINCIAL ASSESSMENT

GRADE 11

AGRICULTURAL SCIENCES

MARKING GUIDELINE JUNE 2019

MARKS : 150

TIME : 2 ½ hours

This MARKING GUIDELINE consists of 08 pages

SECTION A

QUESTION 1

1.1 MULTIPLE CHOICE:

1.1.1 C ✓

1.1.2 B ✓

1.1.3 A ✓

1.1.4 D ✓

1.1.5 D ✓

1.1.6 B ✓

1.1.7 C ✓

1.1.8 A ✓

1.1.9 D ✓

1.1.10 B ✓

(10 x 2)

(20)

1.2 MATCHING COLUMNS:

1.2.1 A only ✓✓

1.2.2 A only ✓✓

1.2.3 B only ✓✓

1.2.4 Both A and B ✓✓

1.2.5 None ✓✓

(5 x 2) (10)

1.3 **AGRICULTURAL TERMS/ PHRASES:**

- 1.3.1 Isomer ✓✓
- 1.3.2 Atom ✓✓
- 1.3.3 Adsorption/ Cation Adsorption ✓✓
- 1.3.4 Atomic number ✓✓
- 1.3.5 Haematite/ Iron ✓✓

(5 x 2) (10)

1.4 **CHANGING THE UNDERLINED WORD(S):**

- 1.4.1 Polysaccharide ✓
- 1.4.2 Electrons ✓
- 1.4.3 Organic matter ✓
- 1.4.4 Reserve acidity ✓
- 1.4.5 Ammonification ✓

(5 x 1) (5)

TOTAL SECTION A: [45]

SECTION B

QUESTION 2

2.1.1 Organic Compounds

- A. Water Molecule ✓ (1)
- B. Hydrogen Molecule ✓ (1)

2.1.2 A water molecule

- Polar covalent bond ✓ (1)
- Unequal sharing of valence electrons/ Sharing of pair of electrons between atoms ✓ (1)

B hydrogen molecule

- Non – polar covalent bond ✓ (1)
- Equal sharing of pair of electrons between atoms ✓ (1)

2.1.3 Chemical formula for compound A (Water)

- H_2O ✓✓ (2)

2.1.4 Functions of Compound A (Water)

- Water is a solvent/ dissolve mineral salts to be absorbed by plants ✓✓
- Chemical reactions take place in water eg. Photosynthesis ✓✓
- Transport medium/ Substances dissolved in water can be transported around the body ✓✓
- Body form or shape and support/ Cytoplasm of cells consists mainly water ✓✓
- Regulate or control body temperature ✓✓
- Needed for reproduction ✓✓

any 3

(3 x 2 = 6)

2.2.1 Difference between

- Hydrophobic: means something that does not like water/ will not readily mix or bond with water ✓✓
- Hydrophilic: means something that likes water/ will readily mix or be attracted to water ✓✓

(2 x 2 = 4)

2.2.2 Types of fatty acids

- Saturated ✓✓
- Poly – unsaturated ✓
- Mono – unsaturated ✓

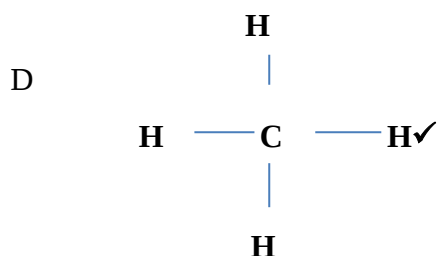
(3 x 1 = 3)

2.3. Table of Organic and Inorganic compounds

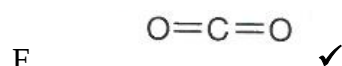
A NH_3 ✓

B Inorganic compound ✓

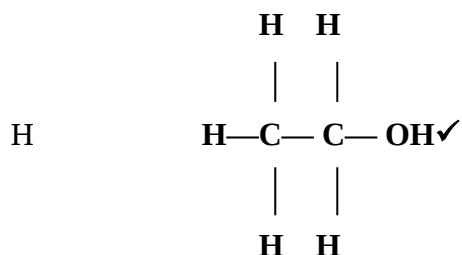
C Methane ✓



E Carbon dioxide ✓



G $\text{C}_2\text{H}_5\text{OH}$ ✓



I Ethanoic Acid ✓

J CH_3COOH ✓

(1 x 10 = 10)

2.4.1 Disaccharides

- Maltose ✓ (1)
- Sucrose ✓ (1)
- Lactose ✓ (1)

2.4.2 Glycosidic bond ✓ (1)

[35]

QUESTION 3 (SOIL SCIENCES)

3.1 Using texture triangle to determine soil textural class

- A. Silt – Loam ✓✓
- B. Loam ✓✓
- C. Sand Clay – loam ✓✓
- D. Clay – Loam ✓✓ (8)

3.2.1 Soil structure

- A. Platy ✓ : Thin, flat plates of soil that lie horizontally/ and usually found in compacted soil ✓ (2)
- B. Prismatic ✓ : Columns or units which are vertically longer than they are broad/usually found in lower horizon ✓ (2)
- C. Blocky ✓ : Irregular blocks that are having sharp angles and sides/ mostly found in the B - Horizon ✓ (2)

3.2.2 Factors influencing the development and stability of soil structure:

- Soil structure and the colloidal matter of the soil ✓
- Type of clay mineral ✓
- Climate ✓
- Alternating moisture and drought ✓
- Plant roots ✓

Any 3 (3)

3.3 Bulk Density

3.3.1 Calculation of bulk density

$$\text{Bulk density} = \frac{750 \text{ g}}{500 \text{ cm}^3} \checkmark$$

$$\text{Bulk density} = 1,5 \text{ g / cm}^3 \checkmark \quad (3)$$

3.3.2 Low bulk density✓ because it is below 1.6 g/ cm³ the bulk density is ideal for plant growth✓✓/
or
low bulk densities✓ are an indication of favourable soil condition for cultivation✓✓ (3)

3.4.1 **Movement of water and air in sand and clay soil**

- Sand – water movement very rapidly downward✓, aeration is good✓ (2)
- Clay – water movement extremely slow✓, aeration very limited✓ (2)

3.4.2 **Ways to increase the percentage of pore space in the top soil**

- Ensure a good soil texture/ the coarser the soil texture, the more total pore space✓
- Ensure a good soil structure✓
- Limit the cultivation of soil✓ Any 2 (2)

3.4.3 **The type of water in point labelled A**

- Gravitational water✓ (1)

3.4.4 **Forms of water present in the soil**

- Adhesion water✓ (1)
- Cohesion water✓ (1)

3.5. Soil colour

3.5.1 Light colour or whitish colour (1)

3.5.2 Yellow colour (1)

3.5.3 Mottled colour (1)

[35]

QUESTION 4: SOIL SCIENCES

4.1.1 **Factors that influence soil temperature labelled A – D**

- A Slope/ topography/ orientation of the land/ aspect (1)
- B Degree of cloud covers (1)
- C Vegetation/ plant cover (1)
- D Soil depth (1)

4.1.2 **Ways in which soil temperature influence plant growth**

- Seed germination is affected by soil temperature✓✓
- Root growth depends on soil temperature✓✓
- Soil microbes are active if temperatures are favourable/ release more nutrients for crops✓✓ any two (2 x 2 = 4)

4.2.1 **Soil horizon which consists of clay/ or iron, manganese and aluminium oxides**

- B – horizon ✓ (1)

4.2.2 **Properties of G – horizon**

- G – horizon results from waterlogged condition✓
- Soil which reflects permanent waterlogging✓
- Wet or waterlogged horizon✓ any 2 (2)

4.2.3 **Reasons for the classification of soil**

- Optimal utilisation of land/ effective use of land✓
- Homogeneous production units✓
- Choice of crop✓

- Planning of farming activities/ scientific farm planning✓
- Allocation of land/ for agricultural purpose/ forestry/ game reserves✓
- Valuation of soil/ used to value land when applying for a loan✓ **any two** (2)

4.2.4 Levels of taxonomic soil classification system used in South Africa

- Soil forms✓ (1)
- Soil families✓ (1)

4.3.1 Group of micro – organisms in the soil

- Bacteria✓
- Fungi✓
- Algae✓
- Protozoa✓
- Actinomycetes✓ **any 2** (2)

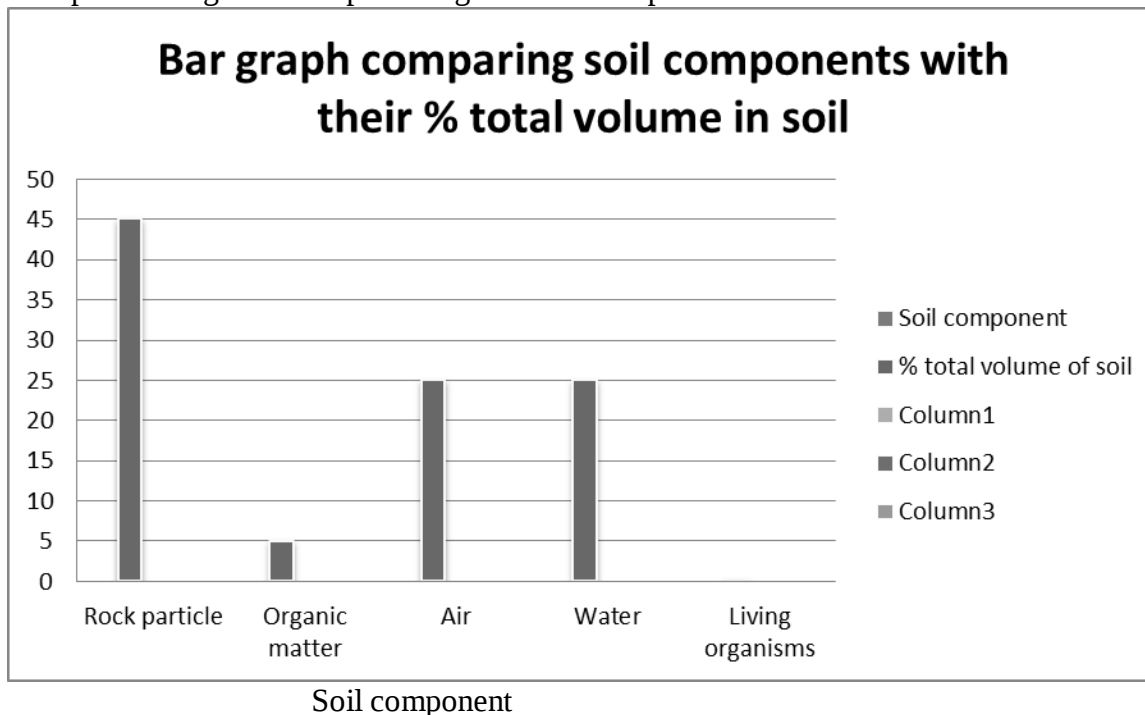
4.3.2 Beneficial effects of micro – organisms

- Breakdown plant and animal remains to release plant nutrients✓
- Form humus which improve soil structure and water retention✓
- Release CO₂ in the atmosphere during decay of plant materials✓
- Help to turn milk into dairy products – sour milk, yoghurt, cheese✓
- Help during fermentation of grape sugar to produce wine✓ **any 2** (2)

4.3.3 Micro – organism that plays a role in denitrification

- Species of bacteria (Pseudomonas and achromobacter) ✓ (1)

4.4.1 Graph showing different percentages of soil components



Marking of Bar graph:		
Criteria	Yes	No
Bar graph	1✓	0
Heading/ Title	1✓	0
Correct labelling of X-axis	1✓	0
Correct labelling of Y-axis	1✓	0
Indication of unit	1✓	0
Accuracy	1✓	0

4.4.2 Component that forms the most part of the soil

- Rock particles✓

(1)

4.5.1 **Identifying the acidity and alkalinity of soil colloid based on adsorbed cations:**

A. Acid soil✓

(1)

B. Brackish✓

(1)

4.5.2 **Table to compare the saline and sodic soils under:**

	Saline soil	Sodic soil
pH condition	Less than 8, 5✓	Between 8, 5 and 10✓
Dominant salts	Ca ⁺⁺ and Mg ⁺⁺ ✓	Na ⁺ ✓
Surface appearance	White brack or salt crystal crust✓	Black crust✓
Corrective measures	Over – irrigation to leach Out salts✓	Over – irrigation to leach out salts✓
	Improve drainage✓	Apply gypsum✓

Any three of the above mentioned

(3 x 2 = 6)

[35]

TOTAL SECTION B

[105]

GRAND TOTAL

[150]