



Access fun Grade 8–12 quizzes, matric past papers, K53 learner mock tests, and NBT prep!

All in one easy-to-use app.

DOWNLOAD GO STUDY NOW



Tap on the buttons above to download the app

 www.gostudy.club



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2020

**AGRICULTURAL SCIENCES P1
MARKING GUIDELINE
(EXEMPLAR)**

MARKS: 150

This marking guideline consists of 9 pages.

SECTION A**QUESTION 1**

- | | | | | |
|-----|--------|--------------------|----------|------|
| 1.1 | 1.1.1 | C ✓✓ | | |
| | 1.1.2 | D ✓✓ | | |
| | 1.1.3 | C ✓✓ | | |
| | 1.1.4 | A ✓✓ | | |
| | 1.1.5 | C ✓✓ | | |
| | 1.1.6 | D ✓✓ | | |
| | 1.1.7 | A ✓✓ | | |
| | 1.1.8 | B ✓✓ | | |
| | 1.1.9 | D ✓✓ | | |
| | 1.1.10 | B ✓✓ | (10 x 2) | (20) |
| 1.2 | 1.2.1 | B only ✓✓ | | |
| | 1.2.2 | A only ✓✓ | | |
| | 1.2.3 | None ✓✓ | | |
| | 1.2.4 | B only ✓✓ | | |
| | 1.2.5 | Both A and B ✓✓ | (5 x 2) | (10) |
| 1.3 | 1.3.1 | Halogen ✓✓ | | |
| | 1.3.2 | Lewis structure ✓✓ | | |
| | 1.3.3 | Loam ✓✓ | | |
| | 1.3.4 | Nitrogen ✓✓ | | |
| | 1.3.5 | Colloid ✓✓ | (5 x 2) | (10) |
| 1.4 | 1.4.1 | Cation ✓ | | |
| | 1.4.2 | Hygroscopic ✓ | | |
| | 1.4.3 | Acid ✓ | | |
| | 1.4.4 | Mycorrhiza ✓ | | |
| | 1.4.5 | Illuviation ✓ | (5 x 1) | (5) |

TOTAL SECTION A: 45

SECTION B**QUESTION 2: BASIC AGRICULTURAL CHEMISTRY****2.1 Compounds****2.1.1 Classification of compounds**

A – Organic ✓

B – Inorganic ✓

(2)

2.1.2 Reason

A – Presence of carbon atom ✓

B – Absence of carbon atom ✓

(2)

2.1.3 Name of compounds with the same molecular formula but different structure

Isomers ✓

(1)

2.1.4 Chemical formula of a compound represented by structure A• C_4H_{10} ✓✓**OR**• $CH_3(CH_2)_2CH_3$ ✓✓

(2)

2.1.5 Identification of the letter

(a) C ✓

(b) B ✓

(2)

2.2 Matter/elements/compounds/mixtures**2.2.1 Identification of substances****A** – Compound ✓**B** – Homogeneous mixture ✓**C** – Heterogeneous mixture ✓

(3)

2.2.2 Difference between an element and a compound

Element is a substance that cannot be broken down by chemical means ✓

Compound is a substance formed when two or more elements are chemically combined ✓

(2)

2.2.3 Distinguishing between homogeneous and heterogeneous mixtures**Homogeneous** – mixture in which the dissolved solute cannot be separated from the solvent by physical means ✓**Heterogeneous** – mixture in which the components can be separated by physical means ✓

(2)

2.3 Fatty acids**2.3.1 Identification of the fatty acid**

A – Unsaturated fatty acid ✓

B – Saturated fatty acid ✓

(2)

2.3.2 Indication of the letter representing the fatty acid

(a) Originating from plants – A ✓

(b) Solid at room temperature – B ✓

(c) Has a high melting point – B ✓

(d) Liquid at room temperature – A ✓

(4)

2.3.3 TWO importance of fats in living organisms

• Provide a source of stored energy ✓

• Source of insulation and temperature control ✓

• Vital part of membrane structure ✓

• Play a role in the flow of energy in and out of living cells ✓

• Assist in signal transduction ✓

(Any 2)

(2)

2.4 pH values**2.4.1 Indicating the pH of substances****Baking powder** – Alkaline ✓**Orange juice** – Acidic ✓**Milk** – Neutral ✓**Battery acid** – Strongly acidic ✓

(4)

2.4.2 Indicating the substance with a high concentration of(a) **Hydroxide ion** – Baking powder ✓(b) **Hydrogen ion** – Battery acid ✓

(2)

2.5 Monosaccharide**2.5.1 Names of the structures**

A – Fructose ✓

B – Glucose ✓

(2)

2.5.2 Indication of the compound formed from fructose and glucose

Sucrose ✓

(1)

2.5.3 TWO elements that are basic composition of carbohydrates

• Carbon ✓

• Hydrogen ✓

• Oxygen ✓

(Any 2)

(2)

[35]

QUESTION 3: SOIL SCIENCE**3.1 Soil texture****3.1.1 Indication of the sample**

- (a) Sample B ✓
- (b) Sample A ✓
- (c) Sample B ✓
- (d) Sample A ✓

(4)

3.1.2 Commenting on the pore space of soil sample B by referring to bulk density

Soil sample B has a high bulk density / 3,2 g/cm³ ✓ and therefore lower pore space ✓

(2)

3.2 Soil structure**3.2.1 Identification of the structure**

- A – Platy ✓
- B – Prism-like/columnar/prismatic ✓
- C – Crumb/spheroid ✓

(3)

3.2.2 Indicating the letter representing the structure

- (a) A ✓
- (b) C ✓

(2)

3.2.3 TWO malpractices leading to the destruction of structure

- Flood irrigation ✓
- Cultivation of soil when it is too dry or wet ✓
- Ploughing and other tilling methods ✓
- Overgrazing / burning / removal of plant material ✓
- Movement of animals and equipment over wet soil ✓
- Irrigation leading to salt accumulation ✓

(Any 2) (2)

3.3 Soil moisture**3.3.1 Naming the term**

- A – Saturation point ✓
- B – Field water capacity ✓

(2)

3.3.2 Reason

- A – Soil is completely filled with water ✓
- B – Amount of water held in soil after saturation and drainage ✓

(2)

3.3.3 Plant response grown in soils in Container C and D

- (a) B – Plants will grow optimally ✓
- (b) C – Plants will wither/die ✓

(2)

3.3.4 Differentiation between *temporal* and *permanent wilting points*

Temporal wilting – The point when plants appear wilted only during the hottest part of the day and recover ✓

Permanent wilting – Plants do not recover from wilting ✓

(2)

3.4 Soil colour**3.4.1 Differentiation between *homogeneous* and *non-homogeneous* soil colour****Homogeneous** – Single dominant colour in soil ✓**Non-homogeneous** – Mixture of soil colours ✓ (2)**3.4.2 TWO factors determining the colour of soil**

- Presence of water ✓
- Gleying conditions ✓
- Organic material ✓
- Presence of oxides ✓
- Presence of carbonates ✓

(Any 2) (2)

3.5 Soil gas**3.5.1 Indication of the gas deficient in experiment 1**

Oxygen ✓

(1)

3.5.2 Role the gas could have played if not deficient

Influenced seed germination ✓

(1)

3.5.3 Gas high in soil as a result of activities in experiment 2

Carbon dioxide ✓

(1)

3.5.4 Reason for the high amount of carbon dioxide

Released during respiration ✓ of plant roots and soil micro-organisms ✓

(2)

3.6 Soil temperature**3.6.1 Indication of the letter**

(a) A ✓

(b) C ✓

(c) A ✓

(3)

3.6.2 TWO methods to manipulate soil temperature

- Irrigation ✓
- Mulching ✓
- Clear plastic covers ✓
- Shading ✓

(Any 2) (2)

[35]

QUESTION 4: Soil science**4.1 Soil horizons****4.1.1 Sketching the soil profile**
$$\begin{array}{c} \underline{A} \\ \underline{B} \\ \underline{C} \\ \underline{R} \end{array} \checkmark \checkmark$$

(2)

4.1.2 Indication of the horizon

- (a) E ✓
(b) G ✓

(2)

4.1.3 TWO diagnostic horizons of A horizon

- Humic ✓
- Vertic ✓
- Melanic ✓
- Orthic ✓

(Any 2) (2)

4.2 Soil classification**4.2.1 THREE reasons for classification of soil**

- Optimal utilisation of country's natural resources ✓
- Scientific planning of farm ✓
- Determining the crop production potential of the soil ✓
- Improved soil science communication ✓
- Development of new regions ✓
- Valuation of soils ✓

(Any 3) (3)

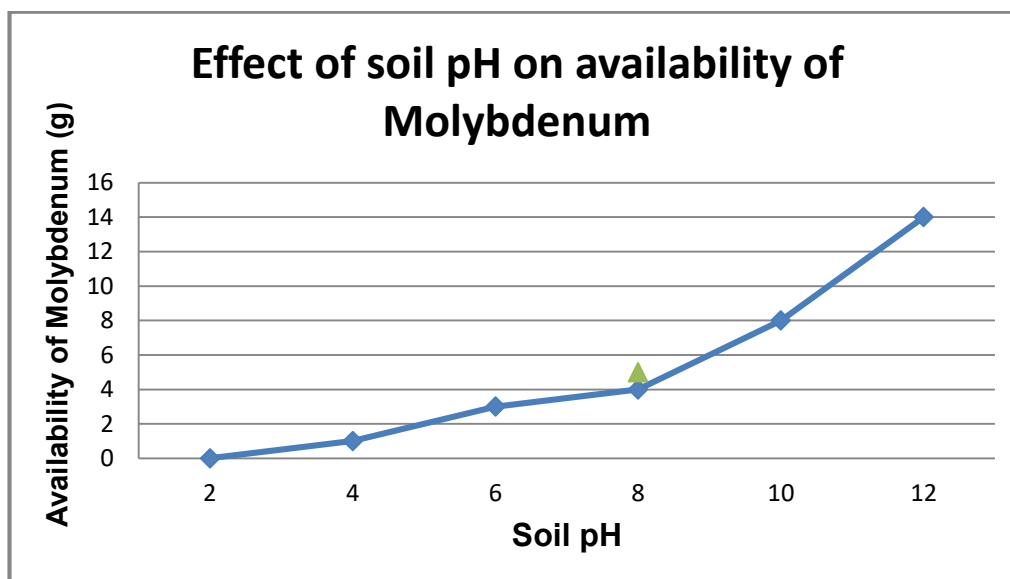
4.2.2 System used in South Africa to classify soil

Binomial system ✓

(1)

4.3 Soil pH

4.3.1 Line graph



Criteria/rubric/marketing guideline

- Correct heading ✓
- X-axis: Correctly calibrated and labelled (Soil pH) ✓
- Y-axis: Correctly calibrated and labelled (Availability of molybdenum) ✓
- Line graph ✓
- Accuracy ✓
- Correct unit (g) ✓

(6)

4.3.2 Deduction of the influence of acidity and alkalinity on the availability of molybdenum

In acid soil/low pH molybdenum is not available ✓

In alkaline soil / high pH molybdenum is more available ✓

(2)

4.3.3 Measures to solve problems of:

(a) Decreased availability of molybdenum in soils with a pH of between 2 and 4

Application of basic fertilisers such as lime/ CaCO_3 ✓

(1)

(b) Toxic quantities of molybdenum in soil with pH of 14

Application of gypsum/ CaSO_4 ✓

(1)

4.4 Soil colloid

4.4.1 Deduction of the process

A – Cation adsorption ✓

B – Cation exchange ✓

(2)

4.4.2 Reason for cation exchange

Potassium cation from the soil solution exchanges with the hydrogen adsorbed in the colloid ✓

(1)

4.4.3 **Indication of the hydrogen cation having an effect on plants**
Hydrogen in the soil solution ✓ (1)

4.4.4 **TWO types of colloids**
Organic colloid ✓
Inorganic colloid ✓ (2)

4.4.5 **Differentiation between *sodic* and *saline soils* with regard to dominant salts**
Sodic soil – Sodium carbonates ✓
Saline soil – Chlorides and sulphates of sodium, calcium and magnesium ✓ (2)

4.5 Soil organisms

4.5.1 **Classification of the worms into groups of soil organisms**
Macro-organisms ✓ (1)

4.5.2 **TWO conditions for the survival of worms**

- Organic nutrients ✓
- Mineral nutrients (nitrogen/phosphorus/potassium) ✓
- Soil moisture close to field water capacity ✓
- Soil air for respiration ✓
- Optimum temperature (temperature between 25 °C and 30 °C ✓
- Optimum soil pH ✓ (Any 2) (2)

4.5.3 **Explanation of how worms will assist farmers**

- Break down plant and animal remains ✓ to liberate plant nutrients ✓
- Improve soil structure ✓ for increased water retention capacity ✓
- Worm casts is rich in organic matter ✓ which improves soil fertility ✓
- Maintain CO₂ concentration ✓ which is used by plants during photosynthesis ✓ (Any 1) (2)

4.6 Nutrient cycle

Nutrient cycle increasing nutrient content in plants

(a) **Protein content** – Nitrogen cycle ✓ (1)

(b) **Carbohydrate content** – Carbon cycle ✓ (1)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150