Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 10

NOVEMBER 2020

AGRICULTURAL SCIENCES P2 MARKING GUIDELINE (EXEMPLAR)

MARKS: 150

This marking guideline consists of 8 pages.

SECTION A

1.1	1.1.1	C √√		
	1.1.2	C √√		
	1.1.3	C √√		
	1.1.4	A √√		
	1.1.5	C √√		
	1.1.6	A √√		
	1.1.7	C √√		
	1.1.8	A √√		
	1.1.9	D √√		
	1.1.10	B √√	(10 x 2)	(20)
1.2	1.2.1	H √√		
	1.2.2	D √√		
	1.2.3	A √√		
	1.2.4	H √√		
	1.2.5	G √√	(5 x 2)	(10)
1.3	1.3.1	Illuviation √√		
	1.3.2	Invasive √√		
	1.3.3	Eutrophication √√		
	1.3.4	Nucleus √√		
	1.3.5	Meiosis √√	(5 x 2)	(10)
1.4	1.4.1	Bioturbation √		
	1.4.2	Grapes √		
	1.4.3	Physical √		
	1.4.4	Cytokinesis √		
	1.4.5	Gene √	(5 x 1)	(5)

TOTAL SECTION A: **45**

SECTION B

QUESTION 2: SOIL SCIENCE

2.1 2.1.1 **Description of how soil benefit from plants**

- Plant roots hold soil together and prevent soil erosion √
- Plants add nutrients to the soil when it decomposes √
- Plants reduce water loss through providing shade and cover

(Any 2 x 1) (2)

2.1.2 **Functions of soil to plants**

- Medium of space in which plants grow √
- Soil anchors and provide support for plants √
- Supply plants with nutrients and water √ (Any 2 x 1) (2)

2.1.3 **Ways in which animals benefit from soil**

- Animals eat plants that grows in soil √
- Soil provides a home/ habitat for small living organisms √ (2)

2.1.4 Organic matter √ 5% √ (2)

2.2 2.2.1 **Class of minerals**

- Group A – Primary Mineral √ (1)
- Group B – Secondary Mineral √ (1)

2.2.2 **Formation of secondary minerals**

- **Secondary minerals** are formed when primary minerals undergo chemical change √ like oxidation and temperature variations they lose some of their original properties. (1)

2.2.3 **Characteristics of soil caused by minerals**

- Colour √
- pH √
- Fertility √ (Any 2 x 1) (2)

2.2.4 **Examples of the following minerals**

(a) Precious stones – Diamond/Silver/Gold/Platinum √ (1)

(b) Mineral Ores – Iron ores/Copper ores √ (1)

2.2.5 **Characteristics used by geologists in identifying minerals**

- Colour √
- Lustre √
- Specific gravity √
- Crystal form √
- Cleavage √
- Fracture √
- Tenacity √
- Hardness √
- Transparent √ (Any 2 x 1) (2)

2.3 2.3.1 **Types of rocks**

(a) Sedimentary rock √ (1)

(b) Igneous rock √ (1)

(c) Igneous rock √ (1)

(d) Metamorphic rock √ (1)

2.4 2.4.1 **Importance of weathering of rocks**

- Formation of soil √
- Release of plant nutrients √
- Replacement of lost soil √ (Any 2 x 1) (2)

2.4.2
- **Hydrolysis** – Less soluble minerals react with water to form a new mineral that is softer and easier to weather √ (1)
- **Carbonation** – water react with carbon dioxide and form carbonic acid that weakens rock minerals √ (1)

2.5 2.5.1 North-facing slope √ (1)

2.5.2 It receives direct sun rays √ (1)

2.5.3 Aspect / Orientation √ (1)

2.5.4 The North-facing slope receives more sun rays and raises temperature √ which facilitates break down of rock. √ (2)

2.5.5 **Climatic factors**

- Rainfall √
- Temperature √
- Sunlight √
- Wind √ (Any 2 x 1) (2)

2.6 2.6.1 (a) Horizon A √

(b) Horizon B √ (2)

2.6.2 **Effects of leaching on agricultural production**

- Leaching washes away plant nutrients causing poor crop production √ (1)

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QUESTION 3: PLANT STUDIES

3.1 3.1.1 **Identification of the following Field crops**

(a) Wheat √

(b) Maize √ (2)

3.1.2 **Total production for all horticultural crops in the graph**

- 7 300 + 6 200 + 3 600 = 17 100 x 1 000 tons √ = 17 100 000 tons √ (2)

3.1.3 **Soil Requirements for growing potatoes**

- Grow best in light, loose soils
- Well-drained loam soils
- Slightly acidic soils (Any 2 x 1) (2)

3.1.4 **The table showing the production volumes of field crops produced in 2008.**

FIELD CROPS	PRODUCTION (1 000 TONS)
Maize	21 000
Wheat	7 300
Sunflower	3800

Marking guideline for the table
• Correct caption √ • Values for-axis correctly labelled and unites indicated (Production in 1 000 t) √ • Values for-axis correctly labelled (Field crops) √ • All field crops and their values indicated in the table √ Table drawn √

(5)

3.1.5 **Ways in which crops contribute to the economy**

- The sale of crops create income for farmers √
- Exportation of crops brings in foreign currency √
- Creates employment opportunities √
- Allows input industries and processing industries to develop √

(Any 3 x 1) (3)

3.2 3.2.1 **Examples of industrial crops**

- Sugar cane √
- Cotton √ (2)

3.2.2 **End products of industrial crops**

- Sugar cane – refined sugar, syrups √
- Cotton – textiles/clothes √ (2)

3.2.3 **Use of fodder crop**

- Feed for livestock √
- Bio fuel √
- Example – Lucerne and red clover √ (Any 2 x 1) (2)

3.2.4 **Reasons for promoting the growing of protected trees**
- Trees are rare or threatened due to heavy use √
- Play a role in the functioning of the environment √
- Trees are of cultural or spiritual importance √ (Any 2 x 1) (2)

3.3 3.3.1 **Classification of vegetables**
A – Stem √
B – Leaf √
C – Fruit √
D – Root √ (4)

3.3.2 **Soil Requirement for root crop**
- Deep and well-drained, loose, loamy to sandy soil √ (1)

3.3.3 **Classification of apples and bananas**
- Apples – Deciduous fruit crops √
- Bananas – Tropical √ (2)

3.3.4 Apples are grown in Western Cape and Langkloof Valley in the Eastern Cape √ (1)

3.3.5 **Uses of grapes**
- Grape juice √
- Jam √
- Raisins √
- Wine √ (Any 2 x 1) (2)

3.3.6 **Climatic conditions for production of grapes**
- Warm dry summers to ripens the grapes √
- Wet and cool winters √ (Any 1 x 1) (1)

3.3.7 **Importance of protea flowers**
- Exportation √
- Decorations and gifts for special occasions √ (2)

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QUESTION 4: SUSTAINABLE NATURAL RESOURCE UTILISATION AND BIOLOGICAL CONCEPTS

4.1 4.1.1 **Difference between primary and secondary resources**

- Primary resources are natural resources √
- Include things such as land, soil and water √
- Secondary resources are made by people from primary resources √
- Example all inputs, machinery, electricity, breeding stock √ (4)

4.1.2 **Soil is classified as non-renewable resource because**

- It takes a long time to develop √ (1)

4.1.3 **Ways of utilising water sustainably**

- Using water without wasting it / using conservative irrigation system √
- Mulching or using cover crops to reduce evaporation √
- Reduce the application of chemicals that pollute water √ (3)

4.2 4.2.1 **Examples of soil degradation**

A – Soil erosion / Soil crusting / Soil compaction √
B – Acidification / Nutrient imbalance / loss √
C – reduce micro-organisms √ (3)

4.2.2 **Agricultural practices that causes soil degradation**

- Use of machinery √
- Use of fertiliser, pesticides and fumigation reduces soil organisms √
- Overgrazing √
- Monoculture √ (Any 2 x 1) (2)

4.2.3 **Measures to reduce surface run off in arable lands**

- Mulching √
- Cover crops √
- Contour ploughing √
- Terracing √
- Planting of trees √
- Zero cultivation √ (Any 2 x 1) (2)

4.2.4 **National Water Act**

- Efficiency – Farmers should use water without wasting it √
- Equity – Farmers should fairly share water resource √
- Sustainability – Farmers should use water in a sustainable manner √

(Any 2 x 1) (2)

4.3 4.3.1 **Animal Cell organelles**

- A – Cytoplasm √
- B – Cell membrane √
- C – Nucleus √ (3)

4.3.2
- Mitochondria √
- Cell Membrane √ (2)

4.3 4.3.3 **Tabulate the differences**

Animal cell	**Plant cell**
Enclosed by cell membrane √	Enclosed by cell wall √
Have small Vacuole √	Have a permanent vacuole √
Have no plastids √	Have plastids √

(Any 2 x 2) (4)

4.3.4 **Specialised animal cells**
- These cells have a structure that allows them to perform a particular function √ e.g Nerve cell, Muscle cells, Skin cells √ (2)

4.4 4.4.1 **Cell division**
- Meiosis √
- Mitosis √ (2)

4.4.2 **Importance of mitosis**
- Facilitates growth
- Replaces worn out cells or tissues √
- Forms the basis of asexual reproduction in plants √ (Any 2 x 1) (2)

4.4.3 **Metaphase I**
- Chromosomes lined up at the equator √
- Attach at the centromere by spindle fibre √ (2)

4.4.4
- Genes √ (1)

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TOTAL SECTION B: 105
GRAND TOTAL: 150