



Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 10**

**NOVEMBER 2020**

**AGRICULTURAL SCIENCES P2  
MARKING GUIDELINE  
(EXEMPLAR)**

**MARKS: 150**

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This marking guideline consists of 8 pages.

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**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)

**[35]**

**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**

- $7\,300 + 6\,200 + 3\,600 = 17\,100 \times 1\,000 \text{ tons} \checkmark = 17\,100\,000 \text{ tons} \checkmark$  (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)

**[35]**

**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**

<b>Animal cell</b>	<b>Plant cell</b>
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)

**[35]**

**TOTAL SECTION B: 105**  
**GRAND TOTAL: 150**