



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 10

NOVEMBER 2018

**AGRICULTURAL SCIENCES P2
MARKING GUIDELINE**

MARKS: 150

This marking guideline consists of 8 pages.

SECTION A**QUESTION 1**

1.1	1.1.1	B √√		
	1.1.2	C √√		
	1.1.3	A √√		
	1.1.4	C √√		
	1.1.5	C √√		
	1.1.6	D √√		
	1.1.7	A √√		
	1.1.8	C √√		
	1.1.9	C √√		
	1.1.10	A √√	(10 x 2)	(20)
1.2	1.2.1	E √√		
	1.2.2	I √√		
	1.2.3	F √√		
	1.2.4	A √√		
	1.2.5	B √√	(5 x 2)	(10)
1.3	1.3.1	Humidity √√		
	1.3.2	Mono-cropping / monoculture √√		
	1.3.3	Fodder crops √√		
	1.3.4	Aeration √√		
	1.3.5	Pods √√	(5 x 2)	(10)
1.4	1.4.1	Exotic/Alien √		
	1.4.2	Inversion √		
	1.4.3	Crusting √		
	1.4.4	Organ √		
	1.4.5	Salinity √	(5 x 1)	(5)

TOTAL SECTION A: 45

SECTION B**QUESTION 2: SOIL SCIENCES****2.1 Description of soil components**

- 2.1.1 (a) Living organisms ✓ (1)
- (b) Organic matter / minerals ✓ (1)
- (c) Soil air ✓ (1)
- (d) Soil water ✓ (1)
- 2.1.2 **Bacteria synthesizing protein in roots**
Nitrogen fixing / aerobic bacteria ✓ (1)
- 2.1.3 **Influence of fine texture on soil air movement**
Presence of micro pores ✓ between soil particles result in a slow movement of air. ✓ (2)
- 2.1.4 **THREE functions of soil in an ecosystem**
- Soil anchors plants. ✓
 - Medium in which plant grows. ✓
 - Supply water, nutrients and air to the plants. / Cycle nutrients needed by plants. / Keeps the soil fertile by decomposing organic matter. ✓
 - Maintain soil structure.
 - Retain water in catchments.
 - Regulate soil and plant temperature.
 - Detoxifies the soil by helping with the suppression of pests, parasites and diseases. (Any 3 x 1) (3)
- 2.2 2.2.1 Secondary mineral ✓ (1)
- 2.2.2 **Examples of secondary minerals**
- Montmorillonite ✓
 - Kaolinite ✓
 - Haematite
 - Goethite
 - Gypsum (Any 2 x 1) (2)
- 2.2.3 **Physical structure of primary minerals**
- Hard ✓ / coarse ✓ (Any 1 x 1) (1)

2.2.4 **Difference between *precious stones* and *soil nutrients***

Precious minerals	Soil nutrients
Minerals of economic and ornamental value ✓	Minerals required for the healthy growth of plants ✓

(2)

2.3 **Mineral identification characteristics**

2.3.1 Hardness ✓ (1)

2.3.2 Cleavage ✓ (1)

2.4 2.4.1 **Types of chemical reactions**A – Hydrolysis ✓
B – Carbonation ✓ (2)2.4.2 **Explanation**

A – Less soluble minerals react with water ✓ to form a new mineral that is softer and easier to weather. ✓ (2)

2.4.3 **Product of respiration by soil microbes**

- Water ✓
- Carbon dioxide (Any 1 x 1) (1)

2.4.4 **Classes of igneous rocks**

- Extrusive rocks ✓
- Intrusive rocks ✓
- Plutonic rocks ✓ (3)

2.5 2.5.1 **Identification of the diagram**

Soil profile ✓ (1)

2.5.2 **Motivation**

A succession of soil horizons ✓ in a vertical section ✓ through the soil is shown. (2)

2.5.3 **Zone of illuviation**

B horizon ✓ (1)

2.5.4 **Justification of QUESTION 2.5.3**

Compounds draining from above accumulate in B horizon ✓ (1)

2.5.5 **Ions accumulating in podzol soils.**

- Plant roots ✓
- Microbes ✓
- Burrowing animals (Any 2 x 1) (2)

2.6 2.6.1 **Interpretation of the equation soil forming factors**

A – O ✓ (1)

B – P ✓ (1)

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QUESTION 3: PLANT STUDIES

- 3.1 3.1.1 **Classification of field crops**
A – Grain crops ✓
B – Oil seed crops ✓
C – Industrial crops ✓ (3)
- 3.1.2 **Definition of field crops**
Crops grown in large fields ✓✓ (2)
- 3.1.3 **Economic importance of maize**
- For making sugars, alcoholic drinks, sugar and syrups ✓
 - Corn oil from maize seeds is used for making margarine and salad oil ✓
 - Source of food for the people and livestock ✓ (3)
- 3.1.4 **Factors influencing successful crop production**
- Choose crops that are suitable for the climatic and soil conditions of an area ✓
 - Plant crops at the right time of the year ✓
 - Maintain correct sowing width / prepare seedbeds ✓
 - Plant good quality seeds/plant seeds that are free from diseases
 - Provide specific nutrients needed by crops to grow
 - Ensure sufficient water supply
 - Practice integrated pest management to control weeds, insects and diseases
 - Erect windbreaks to protect crops from wind and to reduce evaporation and transpiration
 - Harvest crops at the right time / use correct harvesting method
 - Store harvested crops correctly
 - Transport to carry crops must not damage them (Any 3 x 1) (3)
- 3.2 3.2.1 **Identification of fruit**
A – Grapes ✓
B – Avocadoes ✓
C – Citrus fruit ✓
D – Pine ✓ (4)
- 3.2.2 **Climatic requirements of bananas**
Warm climate / cannot tolerate cool or frosty winters / grow well between optimum temperatures 22 °C to 31 °C ✓ (Any 1 x 1) (1)
- 3.2.3 **Vitamins that bananas contain**
Vitamin B ✓
Vitamin C ✓ (2)

3.3 3.3.1 **Nutrient provided**

Protein ✓

(1)

3.3.2 **Quantity of hay produced from lucerne cultivated on 35 hectares of land by a dairy farmer from 2005 to 2010.**

Years of production	Bales of lucerne produced (kg)
2005/6	500
2006/7	1 000
2007/8	1 200
2008/9	2 950
2009/10	3 600

Marking guideline for the table

- Correct caption ✓
- Values for *y*-axis correctly labelled (Lucerne produced) ✓
- Values for *x*-axis correctly labelled (Years of production) ✓
- Units indicated in table (kg) ✓
- Table drawn ✓

(5)

3.3.3 **Trend**

Lucerne production is increasing ✓ with time ✓

(2)

3.3.4 **Quantity bales to be produced on 105 ha**

$$\frac{1\ 000\ \text{kg} \times 105\ \text{ha}}{35\ \text{ha}} \checkmark = 3\ 000 \checkmark\ \text{kg} \checkmark$$

(3)

3.4 3.4.1 **Legislation controlling invasive plants**

Conservation of Agricultural Resource Act, 1983 / CARA Regulation 15 and 16 ✓

(1)

3.4.2 **Reasons for growing 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 ✓

(3)

3.4.3 **Examples of protected forest trees**

- Real Yellowwood tree/*Podocarpus Latifolius* ✓
- Red Stinkwood/*Prunus Africana* ✓

(2)

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QUESTION 4: SUSTAINABLE NATURAL RESOURCE UTILISATION AND BIOLOGICAL CONCEPTS

- 4.1 4.1.1 **Phenomenon displayed in the picture**
Soil erosion ✓ (1)
- 4.1.2 **Impact of soil erosion to the environment**
- Reduction in arable land ✓
 - Loss of soil quality ✓
 - Siltation of dams (Any 2 x 1) (2)
- 4.1.3 **Preventative measures of soil erosion.**
- Allow vegetation in grazing fields to recover ✓
 - Sow cover crops ✓
 - Practise zero cultivation/no tilling ✓
 - Contour plough across slopes
 - Reduce ploughing before it rains (Any 3 x 1) (3)
- 4.1.4 **Causes of soil erosion**
- Overgrazing ✓
 - Mono cropping / mono culture ✓
 - Bad cultivation practices ✓
 - Wetland loss/damage
 - Ploughing the marginal land (Any 3 x 1) (3)
- 4.1.5 **Effects of incorrect disposal of agricultural waste on the soil**
- Rotting crop residues leach nutrients into the soil ✓
 - Buried toxic waste leaches into the soil ✓
 - Metal and glass are non-biodegradable ✓ (3)
- 4.2 4.2.1 **Source of water**
Aquifer ✓ (1)
- 4.2.2 **Classification of a resource**
Renewable ✓ (1)
- 4.2.3 **Management strategies of National Water Act**
- Setting up a national monitoring team ✓
 - Dividing the country into 19 water-management areas ✓
 - Registering and licensing of water use to the Department of Water Affairs ✓ (3)
- 4.3 4.3.1 **Types of cell divisions in representations A and B**
A – Mitosis ✓
B – Meiosis ✓ (2)
- 4.3.2 **Justification**
A – Two daughter cells formed. ✓ (1)
B – Four daughter cells formed. ✓ (1)

- 4.3.3 **Cells formed in diagram B**
Sex cells / gametes ✓ (1)
- 4.3.4 **Cell division producing diploid cells**
Diagram A / Mitosis ✓ (1)
- 4.3.5 **Life consequences without meiosis**
- Sex cells/gametes will not be formed ✓
 - No genetic variation of the species ✓
 - Constant number of chromosomes from one generation to the next will not be provided ✓
 - Infertility (Any 3 x 1) (3)
- 4.4 4.4.1 **Matching of the cell functions**
- A – Nucleus ✓
B – Ribosomes ✓
C – Cell membrane ✓
D – Cytoplasm ✓
E – Mitochondria ✓ (5)
- 4.4.2 **Definition of multicellular and unicellular organisms**
- Multicellular** organisms – are organisms that contain many cells ✓
Example – Plants / animals / fungi ✓ (2)
- Unicellular** organisms – are organisms that consist of one cell ✓
Example – amoeba / bacteria / archaea / protozoa ✓ (2)
- [35]**
- TOTAL SECTION B: 105**
GRAND TOTAL: 150