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**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 10**

**NOVEMBER 2017**

**AGRICULTURAL SCIENCES P2  
MARKING GUIDELINES**

**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 √√	(20)
	1.1.2	A √√	
	1.1.3	C √√	
	1.1.4	A √√	
	1.1.5	A √√	
	1.1.6	D √√	
	1.1.7	B √√	
	1.1.8	D √√	
	1.1.9	A √√	
	1.1.10	D √√	
1.2	1.2.1	E √√	(10)
	1.2.2	G √√	
	1.2.3	D √√	
	1.2.4	B √√	
	1.2.5	F √√	
1.3	1.3.1	Nuclear envelope/nuclear membrane √√	(10)
	1.3.2	Mineralisation √√	
	1.3.3	Alien / exotic √√	
	1.3.4	Pollution √√	
	1.3.5	Meso-fauna / Meso-organisms √√	
1.4	1.4.1	Weathering √	(5)
	1.4.2	Sex cells / Gametes √	
	1.4.3	Aspect / Direction √	
	1.4.4	Horticultural √	
	1.4.5	Shrubs √	

**TOTAL SECTION A: 45**

**SECTION B****QUESTION 2: SOIL SCIENCE**

- 2.1 2.1.1 **Identification of soil water**  
A. Hygroscopic / Adhesion water ✓ (1)
- 2.1.2 **Motivation of answer to QUESTION 2.1.1**  
In an air dry soil sample, only hygroscopic water is present ✓ and it can only be removed by strong heating ✓ (2)
- 2.1.3 **Accessibility of water to plants and explanation**  
No ✓  
Because hygroscopic / adhesion water is tightly bound to soil particles ✓ (2)
- 2.1.4 **Safety precaution taken in the experiment**  
Use of tongs to hold the test tube ✓ (1)
- 2.1.5 **Types of water not depicted in the diagram**  
• Capillary / cohesion water ✓  
• Gravitational / free / percolation water ✓ (2)
- 2.2 2.2.1 **Characteristics of mineral identification**  
A. Cleavage ✓ (1)  
B. Lustre ✓ (1)  
C. Purity ✓ (1)  
D. Tenacity ✓ (1)  
E. Density ✓ (1)
- 2.2.2 **THREE characteristics of primary minerals**  
• Primary minerals are still in their original form / have not changed chemically ✓  
• Crystallise from cooling magma ✓  
• Are coarse and hard ✓ (3)
- 2.3 2.3.1 **Soil forming factor mentioned in the passage**  
Bedrock / parent rock ✓ (1)
- 2.3.2 **Classification of rocks**  
A. Sedimentary rocks ✓ (1)  
B. Metamorphic rocks ✓ (1)  
C. Igneous rocks ✓ (1)

2.3.3 **THREE cultivation properties of soils formed from sedimentary rocks**

- Leaching is high / nutrients are washed away ✓
- Low in fertility ✓
- Easy to till / cultivate ✓
- Well drained and well aerated ✓
- Often acidic as a result of leaching ✓
- Suitable for growing underground / root crops ✓
- High salt concentration / brackish ✓

(Any 3) (3)

2.4 2.4.1 **Comparison of extrusive and intrusive rocks**

Intrusive rocks	Extrusive rocks
Magma cools underneath the soil surface ✓	Magma cools on the earth's surface ✓
Have crystal grains that are coarse textured	Have crystal grains that are fine textured

(Any 2) (2)

2.5 2.5.1 **Identification of soil forming factor**

Topography / Geography ✓

(1)

2.5.2 **Point where soil is deeper**

D ✓

(1)

2.5.3 **Reasons for different soil depths**

At point C water runs down very quickly and erodes the available soil ✓ which is deposited at point D ✓

(2)

2.5.4 **Features of topography**

A. Altitude ✓

(1)

B. Aspect ✓

(1)

C. Slope ✓

(1)

2.5.5 **Human activities that have a direct impact on soil formation**

- Removing vegetation cover
- Overgrazing
- Veld burning
- Tillage / ploughing
- Use of heavy machinery

(Any 3) (3)

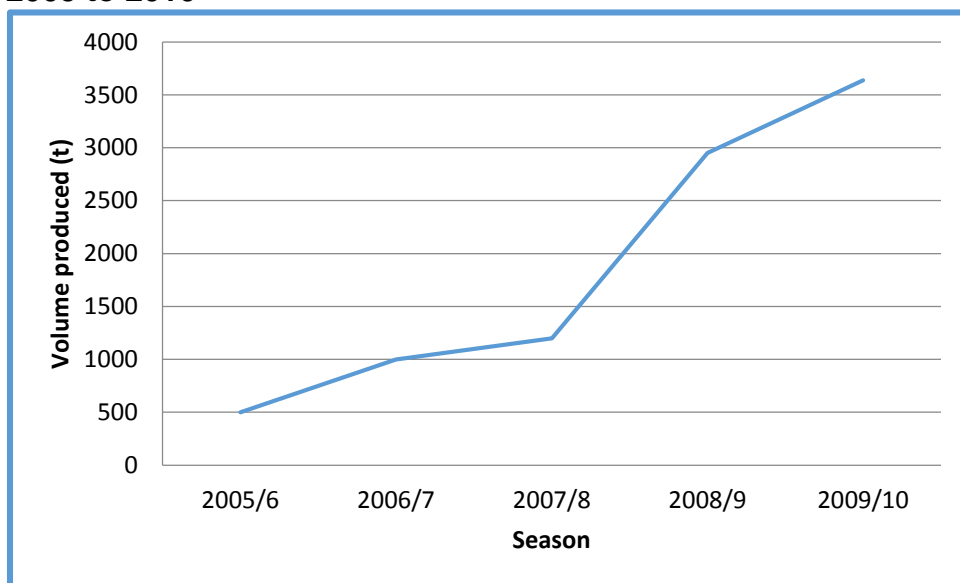
**[35]**

**QUESTION 3: PLANT SCIENCE****3.1 3.1.1 Matching crop classes**

- |                       |     |
|-----------------------|-----|
| A. Industrial crops ✓ | (1) |
| B. Fodder crops ✓     | (1) |
| C. Oil seed crops ✓   | (1) |
| D. Forest crops ✓     | (1) |

**3.1.2 Economic importance of crops in South Africa**

- Generate foreign exchange ✓
  - Create employment ✓
  - Contribute to the country's Gross Domestic Product ✓
  - Support the financial sector ✓
- (Any 3) (3)

**3.2 3.2.1 A bar graph showing the volumes of wheat production from 2005 to 2010****Marking guideline for the graph**

- Correct heading ✓
  - Y-axis correctly labelled (Volume produced) ✓
  - X-axis correctly labelled (Season) ✓
  - Correct type of graph (line graph) ✓
  - Units indicated (t) ✓
  - Correct scale ✓
- (6)

**3.2.2 Trend of wheat production from 2005 to 2010**

- Wheat production increased ✓ with time ✓
- (2)

- 3.2.3 **The volumes of all grains produced in 2005**  
 Maize + wheat + sorghum = total grain crop production ✓  
 $6000\text{ t} + 500\text{ t} + 900\text{ t} = 7400\text{ t}$  ✓ (2)
- 3.2.4 **Protein rich fodder crop**  
 Lucerne ✓ (1)
- 3.2.5 **Why legumes are rich in proteins**  
 They form a symbiotic relationship with nitrogen fixing bacteria ✓  
 which provide the plant with nitrogen that is used to make proteins ✓ (2)
- 3.3 3.3.1 **The vitamin oranges contain**  
 Vitamin C ✓ (1)
- 3.3.2 **Medicinal uses of oranges**
- Fight flu infections ✓ (1)
  - Treat nausea ✓ (1)
- 3.3.3 **THREE benefits of processing oranges to fruit juice**
- Value addition / Increase profit ✓
  - Increase shelf life/ Prevents rotting ✓
  - Maintain constant supply throughout the year ✓
  - Creates job opportunities ✓ (Any 3 x 1) (3)
- 3.4 3.4.1 **Identification of invader plant species**
- A. Category 3 ✓ (1)
  - B. Category 2 ✓ (1)
  - C. Category 1 ✓ (1)
- 3.4.2 **Reasons for eradicating invader plant species**
- Cause loss of indigenous plants ✓
  - Some species are poisonous to livestock and humans ✓
  - Cause water shortages ✓ (Any 2) (2)
- 3.4.3 **Difference between softwood and hardwood trees**
- **Softwood plantations:** consist of trees that produce light, soft wood with a coarse grain. ✓ (1)
  - Example:** pine trees ✓ (1)
  - **Hardwood plantations:** consist of trees that produce heavy hardwood with a fine grain. ✓ (1)
  - **Example:** eucalyptus / gum trees / wattle trees (Any 1) (1)

**[35]**

**QUESTION 4: SUSTAINABLE USE OF RESOURCES AND BIOLOGICAL CONCEPTS**

- 4.1 4.1.1 **Example of a non-renewable resource**  
Land / Soil ✓ (1)
- 4.1.2 **Reason**  
Soil cannot be replaced ✓ within a short period of time ✓ (2)
- 4.1.3 **Environmentally sustainable method**  
A ✓ (1)
- 4.1.4 **Justification of 4.1.3**
- Use of animal drawn plough does not compact the soil ✓
  - There is minimal air pollution ✓
  - Manure from the cattle adds organic matter to the soil ✓ (3)
- 4.2 4.2.1 **Physical property of water**  
Turbidity ✓ (1)
- 4.2.2 **Definition of turbidity**  
Refers to the cloudiness of water that is caused by suspended solid particles ✓ (1)
- 4.2.3 **THREE issues affecting supply and quality of water in South Africa**
- Increasing demand / population growth ✓
  - Invasive alien plants ✓
  - Pollution ✓
  - Urbanisation ✓
  - Drought / Climate change / global warming ✓
  - Exploitation of ground water ✓
  - Afforestation ✓ (Any 3) (3)
- 4.2.4 **Act that regulates water**  
National Water Act of 1998 ✓ (1)
- 4.2.5 **THREE effects of soil pollution on natural resources**
- Balance of flora and fauna is disturbed ✓
  - Soil salinity increases ✓
  - Soil organisms are killed by soil pollutants ✓
  - Plants growing on polluted soil may contain poisonous chemicals ✓ (Any 3) (3)



**4.2.6 TWO methods to dispose of non-biodegradable waste**

- Reusing material on the farm ✓
- Returning containers to suppliers ✓
- Collection of waste for recycling ✓

(Any 2) (2)

**4.3 4.3.1 Parts of a plant cell**

- A. Cell membrane ✓
- B. Cell wall ✓
- D. Vacuole ✓
- E. Nucleus ✓

(4)

**4.3.2 TWO functions of part E**

- Controls cell activities / Determines the way a cell looks and functions ✓
- Plays an essential role in cell division ✓

(2)

**4.4 Differences between plant and animal cells**

		<b>Plant cell</b>	<b>Animal cell</b>
4.4.1	Outer protective layer	Cell wall present ✓	Has a cell membrane ✓
4.4.2	Vacuole	One large vacuole ✓	Many small vacuoles ✓

(2)

(2)

**4.5 4.5.1 Phases of mitosis**

- A. Prophase ✓
- B. Interphase ✓
- C. Anaphase ✓
- D. Metaphase ✓

(1)

(1)

(1)

(1)

**4.5.2 THREE roles of mitosis**

- For growth ✓
- For the repair of damaged tissues ✓
- For asexual reproduction ✓

(3 x 1) (3)

**[35]****TOTAL SECTION B: 105****GRAND TOTAL: 150**