



education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 10

AGRICULTURAL SCIENCES P2

NOVEMBER 2024

MARKING GUIDELINES

MARKS : 150

These marking guidelines consist of 10 pages.



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SECTION A
QUESTION 1**1.1**

1.1.1 B ✓✓

1.1.2 B ✓✓

1.1.3 D ✓✓

1.1.4 C ✓✓

1.1.5 D ✓✓

1.1.6 B ✓✓

1.1.7 B ✓✓

1.1.8 A ✓✓

1.1.9 C ✓✓

1.1.10 A ✓✓

(10 x 2) (20)

1.2

1.2.1 C ✓✓

1.2.2 A ✓✓

1.2.3 E ✓✓

1.2.4 B ✓✓

1.2.5 F ✓✓

(5 x 2) (10)

1.3

1.3.1 Sustainable agriculture ✓✓

1.3.2 Natural resource ✓✓

1.3.3 Metamorphic rocks ✓✓

1.3.4 Primary minerals ✓✓

1.3.5 Alien /exotic plant ✓✓

(5 x 2) (10)

1.4

1.4.1 Chemical weathering✓

1.4.2 O- horizon✓

1.4.3 Cells ✓

1.4.4 Field crop✓

1.4.5 Horticultural crops✓ (5)

TOTAL SECTION A [45]**SECTION B****QUESTION 2: SUSTAINABLE NATURAL RESOURCE UTILISATION**

2.1

2.1.2 Type of soil degradation

- Physical degradation ✓ (1)

2.1.2 Tthe Example of of soil degradation:

- Soil erosion ✓ (1)

2.1.3. Adverse effects of soil erosion:

- Loss of soil quality/loss of soil nutrients/ leaching✓
- Water pollution/siltation of rivers, dams/eutrophican✓
- Loss of habitat for soil microbes/reduced soil biodiversit✓
- Loss of aquatic life and biodiversity due to siltation✓ (any 2) (3)

2.1.4 Causes of soil erosion:

- Overgrazing /overstocking/animal tracks✓
- Monocropping/growing of one crop✓
- Ploughing on marginal lands/river banks/wetlands✓
- Ploughing down the slope✓
- Deforestation/uncovered soil/bare soil✓
- Veld burning ✓ (any 1) (2)

2.2.1 The types of agricultural resources

- A. Secondary ✓-windmill/ water tank/resevoir✓
- B. Secondary✓-tractor✓
- C. Secondary✓ -labour✓ (6)

2.2.2 Classification of agricultural resources A

- Renewable resource ✓, the equipment/windmill can be replaced within a short time.✓ (2)

2.3.3 Justification for being a renewable resource

- the equipment/windmill can be replaced within a short time. ✓ (1)
- the dam can be repaired if there is a leak. ✓

2.3**2.3.1 Definition of biodegradable feedstock**

- agricultural wastes that can be broken down/ decomposed by micro-organisms such as bacteria. ✓✓ (2)

2.3.2 India and China. ✓✓ (2)

2.3.3 Scarce means shortage/lack of something. ✓✓ (2)

2.3.4 Ingredients of the biogas digester

- Animal dung/manure. ✓
- Abattoir wastes. ✓
- Feedstock. ✓ (3)

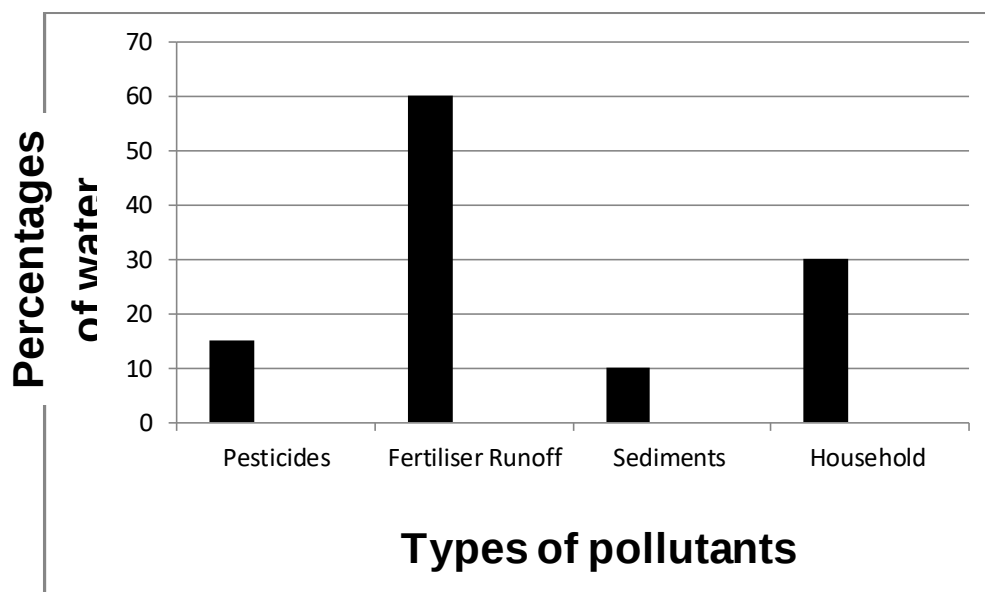
2.3.5 Name of the gas produced in the biogas digester

- methane gas. ✓ (1)

2.3.6. Management techniques of agricultural wastes:

- legislation/polluter pay principle. ✓
- recycling/re-use. ✓
- make compost from plant residues. ✓
- burn carcasses of animals that die from diseases. ✓
- burn disease infected crop residues. ✓
- Use environmentally friendly chemicals/pesticides/CFCs free. ✓
- Test soil or water for contamination. ✓ (any 3) (3)

2.4 **A bar graph of the percentages of pollute water and the types of pollutants**



(6)

Marking criteria for the Graph

Criteria	Marks
Heading/Title✓	1
X –axis calibration/labelling✓	1
Y –axis calibration/labelling✓	1
Type of graph/Bar✓	1
Units (%)✓	1
Accuracy (80% correctly plotted)✓	1

[35]

QUESTION 3: SOIL SCIENCES

3.1

3.1.1

Soil component	Name of soil component
A.	Organic matter✓
B.	Soil air✓
C.	Mineral content ✓
D.	Water ✓

(4)

3.1.2 **Functions of soil air**
Oxygen

- Respiration of plant roots.✓
- Germination of seeds. ✓
- Chemical processes in the soil/ chemical weathering/oxidation.✓

- Decomposition of organic matter ✓ (any 1)

Carbon dioxide

- Weathering of rocks/carbonation. ✓
- Releases plant nutrients. ✓
- Soil pH balance. ✓ any 1)

Nitrogen

- Dilute oxygen. ✓
- Slows chemical process. ✓
- Used for protein synthesis by plants/chlorophyll formation. ✓ (any 1) (3)

3.1.3 Calculation of the total percentages of the soil components

- $5 + 45 + 25 + 25 = 100\%$ ✓ (2)

3.2

3.2.1 Classification of minerals as primary and secondary minerals

- Farm A- secondary minerals. ✓
- Farm B- primary minerals. ✓ (2)

3.2.2 Difference between primary and secondary minerals

Criteria	Primary minerals	Secondary minerals
Temperature	High soil temperature ✓	Low soil temperature ✓

(2)

3.3 Characteristics used to identify minerals:

- Cleavage. ✓ (1)
- Moh's scale. ✓ (1)
- Purity. ✓ (1)
- Streak. ✓ (1)
- Lustre. ✓ (1)

3.4

3.4.1 Definition of chemical weathering

- The breakdown of rocks by chemical reactions. ✓✓ (2)

3.4.2. Type of chemical weathering represented by equation B

- Carbonation ✓ (1)

3.4.3. Name of acid C

- Carbonic acid. ✓ (1)

3.4.4 How hydrolysis lead to weathering of rocks

- Water reacts with muscovite and changes it to illite, biotite to vermiculite ✓ Illite is further hydrolysed to montmorillonite and then to kaolinite. ✓ (2)

3.5

3.5.1 Soil forming processes represented by P and R

- P- parent material.✓
 - R-Relief.✓
- (2)

3.5.2 Features of relief

- Altitude/ height.✓
 - Angle of slope.✓
 - Aspect or direction. ✓ (any 1)
- (1)

3.5.3 Human impact on soil formation

- Mining .✓
 - Construction.✓
 - ploughing .✓ (any 1)
- (1)

3.5.4 Types of Rocks

- a) sedimentary rocks.✓
 - b) igneous rocks.✓
 - c) metamorphic rocks.✓
- (1)
(1)
(1)

3.6

3.6.1 Classification of rocks

- basalt-igneous rock.✓
 - shale- sedimentary rock.✓
 - feldspar- metamorphic rock.✓
- (3)

3.6.2 Characteristics that makes soils from metamorphic rocks unsuitable for root crop cultivation:

- soils are poorly drained.✓
 - Soil is poorly aerated.✓
 - Soil is heavy and difficulty to cultivate.✓
 - The soil is sticky. ✓ (any 1)
- (1)

[35]

QUESTION 4: PLANT STUDIES**4.1****4.1.1 Name of plant labelled A**

- Sorghum/ millet/ guinea corn.✓ (1)

4.1.2 Reasons why sorghum is one of the most important crops

- Staple food for many people in South Africaa.✓
- Sorghum is a rich source of carbohydrates.✓
- It used for making animal feeds.✓
- It used making alcoholic beverages.✓ (any 2) (2)

4.1.3 Provinces where sorghum is produced in South Africa

- Mpumalanga/MP.✓
- Free Stae /FS.✓
- Limpopo /L.✓
- North West/ NW.✓ (Any 1) (1)

4.1.4

- a) Inavsiive species is a species of plant that grows and reproduces quickly so that it spreads through an area replaces the original plants✓✓ (2)
- b)
 - They do not have natural enemies or diseases to reduce their growth, multiplication and spread✓
 - Invasive plants cause loss/ extinction of indigeous trees.✓
 - Inavasiive crop plants compete with crop plants for nutrients/ water/mineral nutrients/sunlight energy ✓ (any1) (1)
- c) Conservation of Agricultural Resources Act (1983) ✓ (1)

4.2**4.2.1 Names of exotic/allien plants**

- d) Lantana camara.✓
- e) Jellycote pine.✓
- f) Black Wattles .✓
- g) Jacaranda. ✓ (any two) (2)

4.2.2 Importance of natural forests

- Habitas/living places for many indigenous plants and animals.✓
- Source of herbal/traditional medicines ✓
- Source of fuel, food, wood for furniture for indigenous people.✓
- Provide aesthetic beauty to the environment and attract tourists/earns valuata for the country.✓
- Employment creation/source of income.✓ (any two) (2)

4.3.

4.3.1 leaf vegetables.✓ (1)

4.3.2 Leaves.✓ (1)

4.3.3 **Properties of morogo**

- Morogo is suited to the South African Climate.✓
- Morogo is suited to a wide range of soil conditions. ✓ (any 1)
- Tolerate high temperatures.✓ (1)

4.3.4 **Importance of Morogo**

- Morogo is an important source of protein/high nutritional value.✓
- Morogo can help reduce malnutrition.✓ (2)

4.3.5 **Types of Soil best suited for growth of vegetables**

- Deep, fertile loam soils with plenty of humus.✓ (1)

4.3.6 **Temperature for optimum growth of vegetables**

- 21°C to 24°C✓ (1)

4.4.

4.4.1 **Economic importance of oranges**

- Oranges are used to make fruit juice.✓
- Employment creation.✓
- Exports of oranges to regional and overseas markets earns the country foreign currency.✓
- Oranges are an excellent source of vitamin C. ✓(any two) (2)

4.4.2 **Trend of orange production from 2019 to 2023**

- Orange production increased with the change in years of production from 2019 to 2023✓✓ (2)

4.4.3

- 40 ha = 1300
60 ha = x
40x = 60 x 1300✓
40 x = 7800
 $X = \frac{7800}{40}$
X = 1950 kg ✓ (2)

4.4.4.

- Average = $\frac{500+1000+1300+2900+3600}{5}$ ✓
= 1860 kg✓ (2)

4.4.5

Avocado	Oranges
20°C to 24°C✓	20°C to 30°C✓

(2)

4.5.

4.5.1 Structure A .✓

(1)

4.5.2

- Cell wall / G✓
- Chloroplasts /F✓
- Large vacuole✓
- Rectangular shape ✓ (any 1)

(1)

4.5.3 DNA✓

(1)

4.6

4.6.1 **Phase of mitosis**

- Anaphase✓

(1)

4.6.2 **Reasons for the phase of mitosis (Anaphase)**

- Daughter chromosomes separate.✓
- Daughter chromosomes migrate to the poles ✓ (any 1)

(1)

4.6.3 **Arrangement of the phases of mitosis in ascending order**

- Metaphase ✓
- Prophase ✓

(2)

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TOTALS SECTION B 105
GRAND TOTAL 150