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.

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 x 1) (5)

TOTAL SECTION A [45]

SECTION B

QUESTION 2: SUSTAINABLE NATURAL RESOURCE UTILISATION

2.1

2.1.1 **Type of soil degration**
- Physical degration ✓ (1)

2.1.2 **The example of of soil degradation**:
- Soil erosion ✓ (1)

2.1.3. **Adverse effects of soil erosion**:
- Loss of soil quality/loss of soil nutrients/ leachimg✓
- 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 rapaired 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/polliter pay principle.✓
- recycling/re-use .✓
- make compost from plant residues .✓
- burn carcases of animals that die from diseases.✓
- burn disease infected crop residues.✓
- Use envirinmentally friendly chemicals/pesticides/CFCs free.✓
- Test soil or water for contamination.✓ (any 3) (3)

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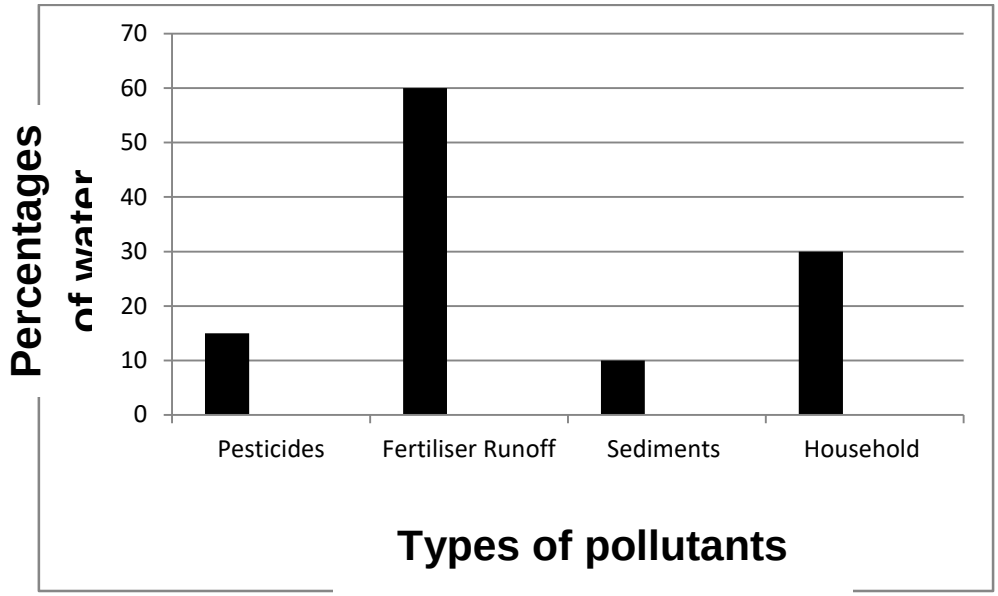
2.4 **A bar graph of the percentages of pollute water and the types of pollutants**



(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.	Oragnic matter✓
B.	Soil air✓
C.	Mineral content ✓
D.	Water ✓

(4)

3.1.2 **Functions of soil air**

Oxygen

- Respiration of plant roots.✓
- Germination of sees. ✓
- Chemical processes in the soil/ chemical weathing/oxidation.✓
- Decomposition of organicmatter✓ (any 1)

Carbon dioxide

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

Nitrogen

- Dilute oxyegen.✓
- Slows chemial process.✓
- Used for protein synthesis by plants/chlorophyl 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 soll temperature✓	Low soil temperature✓

(2)

3.3 **Characteristics used to identufy minerals:**

a) Cleavage.✓ (1)
b) Moh's scale.✓ (1)
c) Purity .✓ (1)
d) Streak .✓ (1)
e) 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 eqaution 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 hydrilysed to montimorillonite 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.✓ (1)
b) igneous rocks.✓ (1)
c) metamorphic rocks.✓ (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) Inavsive 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.✓
- Inavasive 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 rage of soil condtions. ✓ (any 1)
- Toletate 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℃ to 24℃✓ (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 oversees 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.

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

4.4.5

Avocado	Oranges
20℃ *to 24*℃✓	*20*℃ *to 30*℃✓

(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 thephase 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