education

Lefapha la Thuto la Bokone Bophirima
Noord-Wes Departement van Onderwys
North West Department of Education
NORTH WEST PROVINCE

PROVINCIAL ASSESSMENT

GRADE 10

AGRICULTURAL SCIENCES P2

NOVEMBER 2019

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 pages.

SECTION A

QUESTION 1

1.1   1.1.1   C ✓✓
          1.1.2   B ✓✓
          1.1.3   D ✓✓
          1.1.4   A ✓✓
          1.1.5   D ✓✓
          1.1.6   C ✓✓
          1.1.7   A ✓✓
          1.1.8   B ✓✓
          1.1.9   D ✓✓
          1.1.10 C ✓✓   (10 x 2)   (20)

1.2   1.2.1   D ✓✓
          1.2.2   F ✓✓
          1.2.3   H ✓✓
          1.2.4   A ✓✓
          1.2.5   B ✓✓   (5 x 2)   (10)

1.3   1.3.1   Prophase ✓✓
          1.3.2   Dolomite ✓✓
          1.3.3   Cell ✓✓
          1.3.4   Cereal ✓✓
          1.3.5   Salinity ✓✓   (5 x 2)   (10)

1.4   1.4.1   Lustre ✓
          1.4.2   Climate/rainfall/temperature ✓
          1.4.3   Dams ✓
          1.4.4   Chloroplasts ✓
          1.4.5   Pollution ✓   (5 x 1)   (5)

TOTAL SECTION A: 45

SECTION B

QUESTION 2: OPTIMAL RESOURCE UTILIZATION

2.1 **Solar power**

    2.1.1 **Definition of the concept solar power**
- Energy from the sun's rays/sun ✓
- Converted into electricity/electrical energy ✓   (2)

    2.1.2 **Explanation whether solar power is a renewable or non-renewable resource**
A renewable resource ✓

        REASON
- It can be easily replenished
- It is unable to be used up because it exists in abundance
- It is inexhaustible because it replenishes itself naturally ✓
                                   (Any 2)   (2)

    2.1.3 **TWO reasons why homeowners install solar power systems**
- To reduce their reliance on Eskom ✓
- To lower their electricity bills ✓
- To make their homes environmentally friendly ✓   (Any 2)   (2)

    2.1.4 **The benefit of the battery storage system to homeowners**
It provides back-up power in the event of load shedding or power failures ✓   (1)

2.2 **Water pollution**

    2.2.1 **THREE agricultural practices that contribute to water pollution**
- Pesticide crop dusting ✓
- Fertilizer run-off ✓
- Livestock waste ✓   (3)

    2.2.2 **TWO measures that could be applied to control water pollution by sediments**
- Put compost or weed-free mulch on soils to prevent soil from being washed away ✓
- Avoid ploughing fields next to rivers when they are too dry or too wet ✓   (2)

    2.2.3 **Definition of the concept water quality**
- It is the chemical, physical and biological ✓
- characteristics of water ✓   (2)

    2.2.4 **The role of rain in river pollution**
- Rain collects pollutants such as residues ✓
- from pesticides/fertilizers and wash them into the river leading to pollution ✓   (2)

2.3 **Consumption of beef and poultry meat per person in South Africa between 2014 and 2018**

    2.3.1   **Calculation of the average consumption of beef per person between 2014 and 2018**
- 20kg + 15kg + 15kg + 25kg + 20kg ✓
- = 95kg ÷ 5 ✓
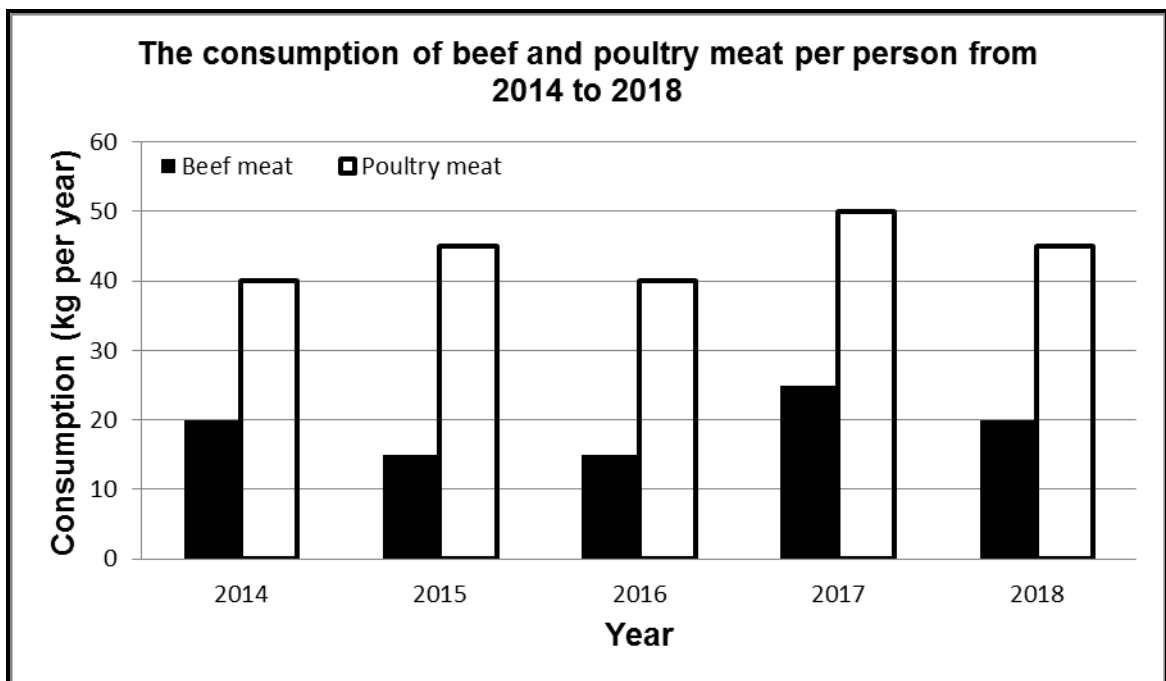- = 19kg ✓   (3)

    2.3.2   **A reason why more poultry meat is consumed in South Africa**
Poultry meat is cheaper than beef/poorer households can only afford cheap poultry meat ✓   (1)

    2.3.3   **A combined bar graph of the consumption of beef and poultry meat per person in South Africa between 2014 and 2018**

The consumption of beef and poultry meat per person from 2014 to 2018

Criteria/rubric for marking the graph
- Correct heading (Consumption of beef and poultry meat per person between 2014 and 2018) ✓
- X-axis: Correct calibrations and labelled (Years) ✓
- Y-axis: Correct calibrations and labelled (Consumption) ✓
- Correct unit on the Y-axis (Kg per year) ✓
- Combined bar graph ✓
- Accuracy ✓   (6)

2.4   **The diagram on soil density**

    2.4.1   **Explanation of the concept compacted soil**
- The condition wherein the soil particles are squashed together ✓
- leaving little space for air and water ✓   (2)

2.4.2 **TWO advantages of loose soil particles in plant growth**
- Have more spaces for air that help plant roots to breath better ✓
- Plant roots are able to access and absorb more water ✓
- Loose soil particles promote the growth of soil microbes ✓
- Plant roots are able to penetrate deeper into the layers and fix plants more firmly ✓   (Any 2)   (2)

2.4.3 **TWO causes of soil compaction**
- The use of heavy machinery on the soil ✓
- Wrong cultivation methods ✓
- Cultivation when the soil is too wet ✓
- Too many cultivations ✓   (Any 2)   (2)

2.4.4 **THREE measures to reduce soil compaction**
- Avoid cultivating soils that are too wet ✓
- Use wider tyres for vehicles/equipment working on soils ✓
- Avoid using heavy machinery on soils ✓
- Scientific cultivation methods/no till/minimum till use ✓   (3)
[35]

QUESTION 3: SOIL SCIENCES

3.1 **The diagram on the soil components**

3.1.1 **A reason for the mineral particles being the largest part of the soil**
Soils are formed from these mineral particles during weathering ✓   (1)

3.1.2 **TWO major mineral types from which the mineral particles are formed**
- Primary minerals ✓
- Secondary minerals ✓   (2)

3.1.3 **Difference between**
Capillary water
- Found around soil pores of soil particles ✓
- and can be absorbed by plant roots ✓   (2)

Hygroscopic water
- Held very tightly by the soil particles ✓
- and cannot be absorbed by plant roots ✓   (2)

3.1.4 **Examples of soil living organisms**

(a) Macro-organisms
- Earthworms ✓
- Ants ✓
- Termites ✓
- Millipedes ✓   (Any 1)   (1)

(b) Micro-organisms
- Bacteria ✓
- Fungi ✓ (Any 1)　　(1)

3.2　**The rock cycle**

3.2.1　**Identification of the rock types**
A – Igneous rock ✓
B – Metamorphic rock ✓　　(2)

3.2.2　**How sedimentary rocks are formed**
- When sediments ✓
- settle under forces of gravity and become hard ✓　　(2)

3.2.3　**THREE examples of sedimentary rocks**
- Sandstone ✓
- Shale ✓
- Limestone ✓
- Dolomite ✓
- Phosphorites ✓
- Gypsum ✓
- Rock salt ✓
- Coal ✓
- Conglomerate ✓ (Any 3)　　(3)

3.2.4　**Explanation of the concept magma**
- Hot fluid material from beneath the earth ✓
- forms lava and other igneous rocks after cooling ✓　　(2)

3.3　**Characteristics of weathering**

3.3.1　**THREE characteristics which apply to chemical weathering**
- Silicate reacts with water to form a new mineral ✓
- Plates of clay absorb water, making it softer and easier to weather ✓
- Water reacts with carbon dioxide to form carbonic acid which weathers rocks ✓
- Rocks are broken down by continued exposure to oxygen ✓
(Any 3)　　(3)

3.3.2　**TWO agents that apply to physical/mechanical weathering**
- Temperature ✓
- Wind ✓
- Water ✓
- Glaciers ✓ (Any 2)　　(2)

3.3.3　**Distinguishing between**

Weathering
- The breaking down of rocks ✓　　(2)
- brought about by biological, chemical and physical agents ✓
Erosion

- The removal of soil/dissolved material ✓
- from one location to another by agents such as water/wind ✓ (2)

3.4 **The factors involved in soil formation**

3.4.1 **The role of the climatic factors in soil formation**
(a) Rainfall
- The amount of rainfall determines ✓
- the rate of chemical/biological weathering and leaching ✓ (2)

(b) Temperature
- Rocks in warm areas whether much faster ✓
- than similar rocks in cold regions ✓ (2)

3.4.2 **The major type of weathering of rocks that is influenced by topography**
- Physical/mechanical weathering ✓ (1)

3.4.3 **The soil forming factor that determines colour, chemical properties and mineral content of soil**
Parent material/rock ✓ (1)

3.4.4 **TWO importance of soil in ecosystems**
- Soil is the growth medium for plants ✓
- Soil supplies water, nutrients and air to plants ✓
- It provides habitat for soil organisms ✓
- Soil help in regulating plant temperature ✓ (Any 2) (2)
[35]

QUESTION 4: PLANT STUDIES AND BIOLOGICAL CONCEPTS

4.1   **The map of South Africa showing the main production areas of specific agricultural commodities**

     Matching the products with the areas indicated on the map

       4.1.1   C ✓   (1)

       4.1.2   E ✓   (1)

       4.1.3   D ✓   (1)

       4.1.4   A ✓   (1)

       4.1.5   B ✓   (1)

4.2   **Exotic species**

       4.2.1   **Definition of the concept exotic species**
- Species growing in an area ✓
- different to their natural habitat ✓
- where they do not naturally occur ✓
- species that originally came from other countries ✓
- and are able to survive/reproduce in another country ✓   (Any 2)   (2)

       4.2.2   **TWO reasons why exotic forest species are preferred to native species**
- Exotic species have growing rates much greater than native species ✓
- Produce more wood per unit of area in less time ✓   (2)

       4.2.3   **The TWO main groups into which exotic forests are classified and ONE example of each**
(a) Hardwood ✓   (1)

         Example:
- Eucalyptus/Gumtree ✓
- Leadwood ✓
- Mopane tree ✓
- Wattle tree ✓   (Any 1)   (1)

         (b) Soft wood ✓   (1)

         Example:
- Pine tree ✓   (1)

4.3   **Lucerne**

      4.3.1   **Agricultural value of lucerne**
             Lucerne is planted as a pasture/fodder crop ✓   (1)

      4.3.2   **The production of lucerne in terms of:**

             (a) Type of soil
- Survives from sandy loam to clay soils ✓
- Can survive in acidic soils with a light application of lime ✓
- It does well on well-drained loam soils ✓   (Any 2)   (2)

             (b) Climate
- Grows well under warm and dry conditions ✓
- It prefers sunny conditions ✓
- It can tolerate wide climatic variations ✓   (Any 2)   (2)

4.4   **Phases of the first meiotic division**

      4.4.1   Matching the phases of the first meiotic division.

             A   Prophase 1 ✓   (1)

             B   Anaphase 1 ✓   (1)

             C   Telophase 1 ✓   (1)

             D   Metaphase 1 ✓   (1)

      4.4.2   **Definition of the term meiosis**
- The type of cell division that results in four daughter cells ✓
- each with half the number of chromosomes of the parent cell ✓   (2)

      4.4.3   **TWO importance of meiosis in living organisms**
- Meiosis assists in the formation of sex cells/gametes ✓
- Halves the number of chromosomes in daughter cells ✓
- Ensures a constant number of chromosomes in body cells from one generation to the next ✓
- Brings genetic variation in organisms ✓   (Any 2)   (2)

4.5 **The diagram on a specific cell**

    4.5.1 **The name of the cell above**
Animal cell ✓ (1)

    4.5.2 **The names of the part that corresponds with the functions:**

        A   Centriole ✓ (1)

        B   Lysosome ✓ (1)

        C   Nuclear membrane ✓ (1)

        D   Cytoplasm ✓ (1)

    4.5.3 **FOUR similarities between animal and plant cells**
- Cell membrane is present in both animal and plant cells ✓
- Both have nucleus ✓
- Mitochondria exists in both cells ✓
- Both have ribosomes ✓
- Endoplasmic reticulum is found in both cells ✓
- Golgi apparatus are present in both cells ✓
- Both have vacuoles ✓ (Any 4) (4)

[35]

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