



**higher education  
& training**

Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

# **MARKING GUIDELINE**

**NATIONAL CERTIFICATE (VOCATIONAL)**

**SOIL SCIENCE  
NQF LEVEL 2**

**9 March 2020**

**This marking guideline consists of 6 pages.**

**SECTION A****QUESTION 1**

- 1.1 B
- 1.2 A
- 1.3 A
- 1.4 C
- 1.5 C
- 1.6 C
- 1.7 D
- 1.8 A
- 1.9 D
- 1.10 B

(10 × 1) [10]

**QUESTION 2**

- 2.1
  - 2.1.1 False
  - 2.1.2 True
  - 2.1.3 True
  - 2.1.4 True
  - 2.1.5 True
- 2.2
  - 2.2.1 Corky
  - 2.2.2 Five
  - 2.2.3 Rust/Rusting
  - 2.2.4 Altitude
  - 2.2.5 Polar

(5 × 1) (5)

(5 × 1) (5)  
[10]

**QUESTION 3**

- 3.1 E
- 3.2 J
- 3.3 H
- 3.4 I
- 3.5 C
- 3.6 K
- 3.7 L
- 3.8 M
- 3.9 D
- 3.10 B

(10 × 1) [10]

**QUESTION 4**

- 4.1 Atom
- 4.2 Root hairs
- 4.3 Condensation
- 4.4 Saturated
- 4.5 Aspect/Orientation
- 4.6 Water table
- 4.7 Chemical bonding
- 4.8 Blocky structure
- 4.9 Micronutrients
- 4.10 Windbreaks

(10 × 1) **[10]****TOTAL SECTION A: 40****SECTION B****QUESTION 5**

- 5.1
  - A mixture is made up of different substances that are not chemically bonded.
  - Compounds are substances consisting of molecules made up of different types of atoms bonded together.

(2 + 2) (4)
- 5.2
  - 5.2.1 Ratio between amount of water vapour in air and amount that air can hold at that temperature
  - 5.2.2 Substance consisting of one type of atom
  - 5.2.3 Moisture found on grass in the morning following a hot day
  - 5.2.4 Covering soil surface to reduce water loss through evaporation
  - 5.2.5 Equals mass of protons and neutrons in the nucleus

(5 × 2) (10)
- 5.3
  - 5.3.1 Transpiration (2)
  - 5.3.2 Loss of water through plant leaves in form of vapour (2)
  - 5.3.3 Droplets of water condensed on inside of plastic bag (3)

5.4 Protons✓ are small positive particles✓ found in nucleus.✓

Neutrons✓ are small neutral particles✓ found in the nucleus.✓

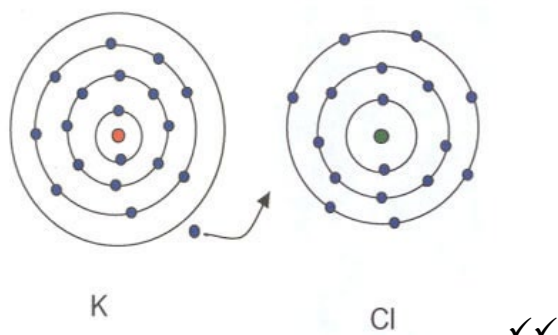
Electrons✓ are small negative particles✓ found outside the nucleus on occupying orbits.✓

(3 × 3) (9)

- 5.5
- Straw
  - Newspapers
  - Plastic sheeting
  - Compost
  - Bark chips
  - Stones or pebbles
  - Groundcover plants

(Any 5 × 1) (5)

5.6 If potassium chloride is dissolved in water each potassium atom gives one of its electrons to a chlorine atom. The potassium atom changes to a positive ion called cation and the chlorine atom gains the electron and becomes a negative ion called anion.✓✓✓



(5)

5.7 Change of substance from solid to liquid or from liquid to gas

(2)

5.8 When heat is added to water molecules move faster✓✓ and some escape the liquid phase and enter the gas state.✓✓

(4)

- 5.9
- Diffusion is the movement of molecules from an area of high concentration to an area of lower concentration.
  - Back diffusion means water molecules diffuse back to the leaf when humidity is high.

(2 × 2) (4)

5.10 5.10.1 Na –sodium✓  
Cl – chlorine✓

(2)

5.10.2 Compound. It is made up of different atoms bonded together.

(3)

**[55]**

**QUESTION 6**

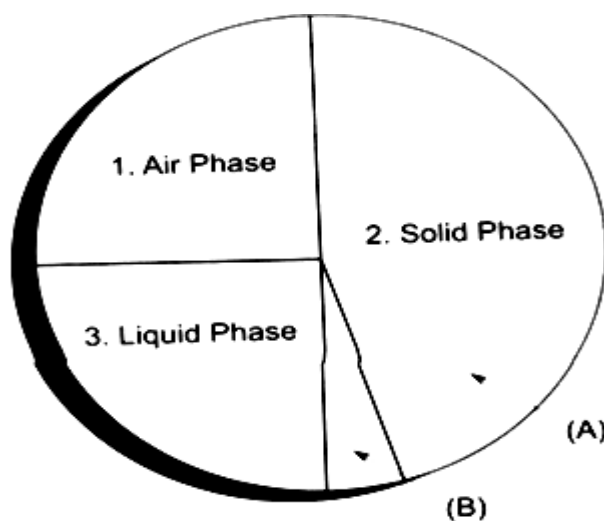
- 6.1
- Soil colour
  - Moisture content of the soil
  - Orientation and shape of the land
  - Vegetation and groundcover
  - Soil depth
- (5)

- 6.2 Relationship between amount of air and water in a certain material. For example, a ratio 2:1 means there is twice as much water than air. (3)

- 6.3
- Eluviation is the movement of minerals within the soil from one horizon to another.
  - Illuviation is the deposition of the leached minerals, usually in the B-horizon.
- (2 + 2) (4)

- 6.4
- Improves soil structure
  - Improves soil texture
  - Improves mineral component of the soil
  - Improves the ability of soil to retain water
  - Improves soil fertility
- (Any 2 × 2) (4)

6.5



A – Inorganic = 45%✓

B – Organic = 5%✓

✓✓✓✓

(6)

- 6.6
- Water
  - Acids
  - Oxidation
- (3)

- 6.7 Clay colloid is an inorganic colloid found in soil with high clay content. Humus colloid aids the formation of aggregates in soil with a low clay content. (2 × 2) (4)

6.8	6.8.1	Water not available to the roots of the plant		
	6.8.2	Degree of coarseness or fineness of soil particles	(2 × 2)	(4)
				<b>[33]</b>

**QUESTION 7**

7.1	Poisoning effect			(2)
7.2	Longer growth period Slow ripening Weak stalks easily flattened by wind or rain Low productivity of tubers, bulbs and fruit		(Any 2 × 2)	(4)
7.3	<ul style="list-style-type: none"> <li>• Macronutrients are required by plants in a large quantity.</li> <li>• Micronutrients are required by plants in a small quantity.</li> </ul>			(4)
7.4	Macronutrient			(2)
7.5	<ul style="list-style-type: none"> <li>• Solvent.</li> <li>• Transport medium</li> <li>• Temperature buffer</li> <li>• Agent for chemical reactions</li> <li>• Makes cells stiff</li> </ul>		(5 × 2)	(10)
				<b>[22]</b>

**TOTAL SECTION B: 110**  
**GRAND TOTAL: 150**