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.

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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

(5 × 1) (5)

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)
[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]**

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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)

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

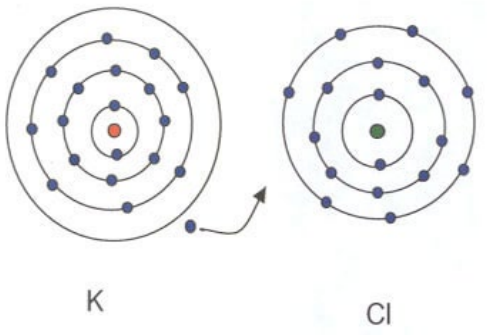
Neutrons✓are small neutral particles✓found in the nucleus.✓

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

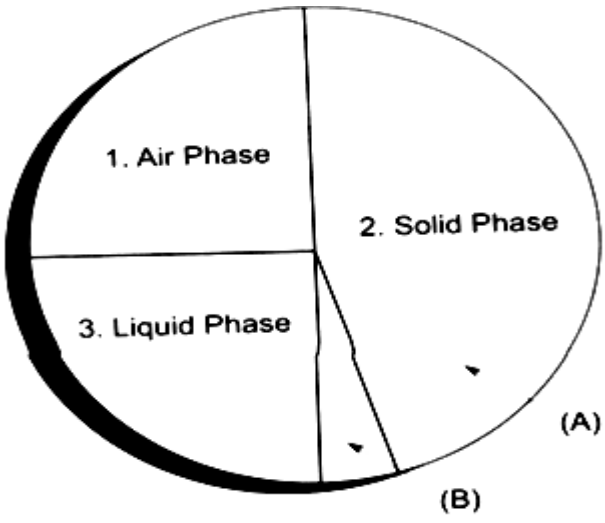
6.1
- Soil colour
- Moisture content of the soil
- Orientation and shape of the land
- Vegetation and groundcover
- Soil depth (5)

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)
[33]

QUESTION 7

7.1 Poisoning effect (2)

7.2 Longer growth period
Slow ripening
Weak talks easily flattened by wind or rain
Low productivity of tubers, bulbs and fruit (Any 2 × 2) (4)

7.3
- Macronutrients are required by plants in a large quantity.
- Micronutrientsbare required by plants in a small quantity. (4)

7.4 Macronutrient (2)

7.5
- Solvent.
- Transport medium
- Temperature buffer
- Agent for chemical reactions
- Makes cells stiff (5 × 2) (10)

[22]

TOTAL SECTION B: 110
GRAND TOTAL: 150

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