higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# MARKING GUIDELINE

## NATIONAL CERTIFICATE (VOCATIONAL)

## PROCESS CHEMISTRY
## NQF LEVEL 3

## 13 November 2024

**This marking guideline consists of 5 pages.**

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## QUESTION 1: FERTILISERS

1.1 1.1.1 Nitrate
1.1.2 Proteins
1.1.3 Mass production
1.1.4 Potash
1.1.5 Inorganic substance

(5 × 1) (5)

1.2 Organic and inorganic fertilisers (2)

1.3 It is a man-made substance, usually made in one or more industrial processes. (2)

1.4 Phosphoric acid (1)

1.5 Yara SA (1)

1.6 Dry fertilisers (1)

1.7
- Easy to use
- Nutrients in liquid fertilisers are carried and spread through the soil in a better way.
- Liquid fertiliser does not need moisture to break down.
- Liquid fertiliser can be applied whenever nutrients are needed. (4)

1.8 1.8.1 C
1.8.2 E
1.8.3 B
1.8.4 D
1.8.5 A

(5 × 1) (5)

1.9 A float separator (1)

1.10 Potassium nitrate and potassium sulphate (2)

1.11 $FeS_2$ (1)

1.12 Pyrite (1)
**[26]**

## QUESTION 2: CEMENT, CALCIUM AND SODIUM COMPOUNDS

2.1
- AfriSam
- Lafarge
- Natal Portland Cement
- Pretoria Portland Cement
- Sephaku Cement (5)

2.2
- Limestone
- Cement rock
- Chalk
- Marl
- Alkali waste
- Gypsum (Any 4 × 1) (4)

2.3
- Magnetite
- Hematite
- Siderite (3)

2.4 It is a fluxing agent that lowers the melting temperature of iron ore. (2)

2.5 $Fe_2O_3 + 3\ C \longrightarrow 2\ Fe + 3\ CO$
√ √ √ √ (2)

2.6 Pretoria Portland Cement (1)

2.7 It is used to slowly heat the materials for various reactions to occur. (2)

2.8
- CaO is used in the building industry to whitewash walls and in the paper industry to white paper.
- CaO is used as a bleaching agent.
- The metal industry uses CaO in the manufacturing of metal alloys.
- The high alkalinity of calcium oxide enables it to be used to purify drinking water and remove impurities like phosphates from sewage. (Any 3 × 1) (3)

2.9 Quicklime (1)

2.10 NaCl (1)

2.11 2.11.1 $NaHCO_3$
2.11.2 NaOH
2.11.3 $Na_2SO_4$
(3 × 1) (3)

2.12 $Na_3(CO_3)(HCO_3)_2H_2O$ (2)

2.13 Mirabilite (1)

2.14 Calcium carbonate;✓ ammonia;✓ NaCl✓ (3)

**[34]**

## QUESTION 3: SOAP, DETERGENTS AND PESTICIDES

3.1
- Unilever
- Colgate Palmolive
- Reckitt Benkisser
- Procter and Gamble (4)

3.2 Amphoteric compounds are easily used in baby products because they do not irritate the eyes. (2)

3.3 Sodium triphosphate is used as a water softener:
- To prevent the formation√ of calcium,√ magnesium or iron salts.√
- To prevent any solid dirt√ from sticking√ to the item removed.√ (3)

3.4 KOH;√ NaOH;√ water√ and a variety of animal√ and vegetable fats√ and oils.√ (3)

3.5 Triglyceride (1)

3.6
- Insecticides
- Herbicides
- Fungicides (3)

3.7
- To supply South Africa with crop protection products.
- To manufacture a wide range of products for household and commercial use.
- To produce products to control unwanted plants, insects, fungi and rodents.
- To make products that stop weeds and unwanted plants from growing. (4)

3.8
- Contact killer
- Systemic killer
- Soil sterilisers (Any 1 × 2) (2)

**[22]**

## QUESTION 4: PULP AND PAPER

4.1 Virgin fibre obtained directly from plants√√

**OR**

It is fibre that has never been used in the manufacture of paper or other products before.

Secondary fibre is fibre obtained from waste paper.√√ (2)

4.2
- Mechanical pulping > A process where pulp is produced by mechanically grinding logs✓ or wood chips.✓
- Chemical pulping > A process where the pulp is obtained from the chemical cooking or digestion✓ of wood or other plant material.✓ (4)

4.3
- Sappi
- Kimberly-Clark
- Mondi
- Nampak (4)

4.4 Hardwood has weaker, shorter fibres which are important for making paper with a smooth surface.✓✓
Softwood have bigger fibres,✓ which provides strength to paper.✓ (4)

4.5
- Blade coater
- Knife coater
- Rod coater
- Roll coater (4)

**[18]**

**TOTAL: 100**

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