higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

WATER AND WASTE-WATER TREATMENT PRACTICE N1

20 April 2021

This marking guideline consists of 5 pages.

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QUESTION 1

1.1
- It must free from germs.
- It must be safe.
- To control PH. (3)

1.2 1.2.1
- For compliance.
- To protect public health.
- Quality management. (2)

1.2.2
- Microbiological indicator organisms.
- Concentrations of chemicals used in the treatment process, disinfectant residuals, and any disinfection by-products.
- Any health-related issues.
- Recommended minimum sampling frequencies specified in the SANS.
- Location of sampling.
- Distribution system being managed. (6)

1.3
- Transpiration, from plants.
- Evaporation, from water sources.
- Condensation, into clouds.
- Precipitation, such as rain and snow.
- Infiltration, absorbed by the soil.
- Emergency/runoff, from water sources such as dams, rivers, springs. (Any 5 × 2) (10)

[21]

QUESTION 2

2.1
2.1.1 False
2.1.2 False
2.1.3 True
2.1.4 True
2.1.5 True

(5 × 1) (5)

2.2
- Position of the water table.
- Configuration of the land surface.
- Nature and structure of rock materials.
- When the water table drops, springs dry up and will flow again when the water table rises. (4)

2.3
- The regulations and local government.
- The Constitution.
- The Act. (3)

2.4
- It removes microscopic particles✓, silt and other suspended material in the water.✓
- Chemicals are added to the water and mixed at a high speed✓ in a large basin.
- Chemicals cause small particles to clump together or coagulate.✓
- The floc begins to settle during this stage.✓ (5)

2.5
- Zone of degradation.
- Zone of active decomposition.
- Zone of recovery.
- Zone of clear water. (4)

[21]

QUESTION 3

3.1
- Allow for planning.
- For troubleshooting.
- To see flow trends.
- To assess the amount of rain or groundwater infiltration. (5)

3.2 3.2.1 Domestic:
- Comes from the water used by the community.
- Comes from storm and surface waters.

E.g., households; commercial and business building
Industrial:
- Comes from industries and the manufacturing process in industrial plants. (4)

3.2.2
- Human waste.
- Household waste.
- Storm water/street washings.
- Ground-water infiltration. (4)

3.2.3
- Waste during the manufacturing process.
- Cleaning equipment.
- Waste used for cooling. (3)

3.3
- Pre-treatment.
- Primary treatment.
- Secondary treatment.
- Tertiary treatment.
- Final influent (disinfection). (5)

[21]

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QUESTION 4

4.1 4.1.1
- Sludge is drawn off by sludge pipe.
- The valve is controlled by hydrostatic pressure.
- It occurs twice a day.
- Valve closed when more h_2o than sludge is leaving. (4)

4.1.2
- Scum removed through.
- Mechanical or manual works.
- Scum returned to an inlet or sent to the digester.
- Tank contents should not be disturbed when scum is removed. (4)

4.2 Hydrochloric acid. (1)

4.3
- Reduces bacterial pollution.
- Reduces ammonia content.
- Reduces nitrate content.
- Reduces phosphate content.
- Reduces potash content.
- Attract birds and are therefore aesthetically advantageous. (6)

[15]

QUESTION 5

5.1
- Goggles
- Rubber apron
- Face shield
- Gloves
- Acid-resistant dust coat
- Rubber boots (6)

5.2
- Clarity
- Colour
- Odour
- Taste (4)

5.3 5.3.1
- Show when services are due.
- Show when equipment needs replacing.
- Show when to lubricate and exercise. (3)

5.3.2
- Drawing of work.
- Details of all components.
- Vital for times of modification or problems. (3)

5.4 A trickling filter consists of a bed of stones about 1 to 2 metres deep.✓ Other media such as plastic could be used.✓ Waste water is distributed to the surface of this bed by various means and allowed to trickle through the bed.✓ Bacteria gather and reproduce on the media until there are enough of them✓ to consume most of the organic material in the waste water.✓
In the trickling filter, the aerobic process bacteria get enough oxygen from the air as the waste water trickles from rock to rock in the filter.✓ (6)
[22]

TOTAL: 100

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