higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

WATER AND WASTE-WATER TREATMENT PRACTICE N1

(8120011)

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This question paper consists of 5 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
WATER AND WASTE-WATER TREATMENT PRACTICE N1
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Sketches must be large, neat and fully labelled.
5. Write neatly and legibly.

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QUESTION 1

1.1 Complete the following table according to the specification of water for domestic use SABS publication 241 of 1984, and write only the answer next to number (1.1.1–1.1.6).

FACTORS	RECOMMENDED LIMITS(minimum)
Electrical conductivity	1.1.1
Total hardness minimum	1.1.2
pH value minimum	1.1.3
Sodium	1.1.4
Fluoride	1.1.5
Nitrate	1.1.6

(6 × 1) (6)

1.2 List FOUR ways in which extraction from water sources and supply can take place. (4)

1.3 Name FOUR recreational facilities of secondary use of water. (4)

1.4 Name THREE natural water supplies in South Africa. (3)

1.5 State the FOUR phases that occur in a water cycle. (4)

[21]

QUESTION 2

2.1. State the difference between ground water and surface water. (2)

2.2 Define the meaning of the following terms:

2.2.1 Springs (2)

2.2.2 Wells (1)

2.3 Tabulate a comparison between ground water and surface water. (8)

2.4. Give FIVE sources of water. (5)

2.5 Name the function of the following pumps:

2.5.1 Roto dynamic pumps

2.5.2 Positive displacement pumps

2.5.3 Diaphragm pumps

(3 × 1) (3)

[21]

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QUESTION 3

3.1 Give one word of the following description:

3.1.1 Free oxygen available in the system obtained from the air or dissolved water

3.1.2 Available oxygen in the system

3.1.3 Water containing large amounts of dissolved salts that have an effect on the taste

3.1.4 A solution of weak salt and acid or a weak base with salts

3.1.5 Combination of elements in a fixed ratio that can be broken down into simpler substances

(5 × 1) (5)

3.2 Explain the purpose of the following elements which occur in water treatment practice:

3.2.1 Stabilisation

3.2.2 Storage reservoir

3.2.3 Screening

3.2.4 Post-chlorination

3.2.5 Pump station

(5 × 2) (10)

3.3 Name THREE processes which occur during the clarification process. (3)

[18]

QUESTION 4

4.1 Briefly explain a horizontal flow sedimentation tank. (4)

4.2 Make a neat labelled, sketch of a convectional sewage system. (8)

4.3 Name FIVE sewage strength tests to be done when sewage is treated. (5)

4.4 Explain the meaning of biological filtration. (3)

[20]

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QUESTION 5

5.1 Explain problems that can occur in a sedimentation tank, when a lack of food and oxygen leads to secondary sludge in the primary sedimentation tank becoming endogenous. (5)

5.2 Give reasons why daily flow records must be taken. (5)

5.3 Briefly explain the benefit of keeping accurate records in each of the following cases:

5.3.1 Operation

5.3.2 Planning

5.3.3 Maintenance

5.3.4 Costing

5.3.5 Research

(5 × 2) (10)
[20]

TOTAL: 100

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