higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

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NATIONAL CERTIFICATE

WASTE-WATER TREATMENT PRACTICE N3

(8120003)

8 August 2019 (X-Paper)
09:00–12:00

This question paper consists of 4 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
WASTE-WATER TREATMENT PRACTICE N3
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 Write down the name of the SI unit in which each of the following is measured:

1.1.1 Electric current

1.1.2 Heat

1.1.3 Mass

1.1.4 Volume

1.1.5 Power

(5 × 2) (10)

1.2 State FIVE factors that influence the volume of water obtained at the end of a pipeline when the valve is opened. (5)

1.3 State the advantages and disadvantages of a butterfly valve. (5)

1.4 Name any FIVE pollutants of natural water. (5)

[25]

QUESTION 2

2.1 Define each of the following terms:

2.1.1 Nitrification (3)

2.1.2 Denitrification (3)

2.1.3 Facultative anaerobes (2)

2.2 Name the THREE categories in which the solids in sewage are classified and state the position where each of those solids are removed on a biological filter plant. (3 × 2) (6)

2.3 List FOUR properties of well-digested sludge. (4)

2.4 Name FOUR different types of settling tanks. (4)

2.5 What are the THREE methods of disposing of digested sludge? (3)

2.6 Which substances are removed during the anaerobic digestion of sludge? (1)

[26]

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QUESTION 3

3.1 Belching is one of the problems that occur in a sewage plant.

Evaluate the likely causes of the problem and point out measures that could be taken to solve it. (5)

3.2 Explain the concept *sludge index.* (2)

3.3 Name SEVEN basic safety rules that should be adhered to by visitors or people employed at sewage works. (7)

3.4 Write down the chemical formula of each of the following:

3.4.1 Carbon dioxide

3.4.2 Methane gas

3.4.3 Sulphuric acid

3.4.4 Hydrochloric acid

3.4.5 Ammonia

(5 × 2) (10)

3.5 List FIVE advantages of stabilisation ponds. (5)
[29]

QUESTION 4

4.1 Name FIVE factors that influence the stability of water. (5)

4.2 Name FIVE areas where green colouring in conjunction with white lettering is used on a sewage plant. (5)

4.3 Draw a neat, labelled sketch to illustrate the slow sand filter. (10)
[20]

TOTAL: 100

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