higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1760(**E**)(J31)T

NATIONAL CERTIFICATE

WATER AND WASTE-WATER TREATMENT PRACTICE N2

(8120022)

31 July 2018 (X-Paper)
09:00–12:00

Nonprogrammable calculators may be used.

This question paper consists of 4 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
WATER AND WASTE-WATER TREATMENT PRACTICE N2
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. Write neatly and legibly.

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QUESTION 1

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.1–1.5) in the ANSWER BOOK.

1.1 Colour measurement in water is measured in Hazen units.

1.2 pH is a measure of the acidity or alkalinity of water.

1.3 The purification process of water may increase the concentration of particulate matter including suspended particles, parasites, bacteria, algae, viruses and fungi.

1.4 Preliminary treatment is any physical, chemical or mechanical process used on water before it undergoes the main treatment process.

1.5 Chemical flocculants are not normally added to water treated by a slow sand filter because the fine sand would clog too quickly.

(5 × 1) **[5]**

QUESTION 2

2.1 Draw a labelled diagram of a Venturi tube. (5)

2.2 Name FIVE advantages of magnetic flow meters. (5)

2.3 Name THREE different shapes of weirs. (3)

2.4 List FIVE reasons why flow meters are essential in a water purification plant. (5)

2.5 Name TWO chemicals which are commonly used for pH adjustment. (2)

[20]

QUESTION 3

3.1 A pipeline is 2,5 km long and 1,5 m in diameter.

Calculate the following:

3.1.1 Volume of the pipeline (4)

3.1.2 Number of hours it will take to fill the pipeline at a constant pumping rate of 150 litres/second (6)

3.2 Name FIVE types of secondary treatments. (5)

3.3 Describe the operation of a circular radial flow tank. (5)

[20]

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QUESTION 4

4.1 Name FOUR flocculants that are generally used in the clarification of water. (4)

4.2 Name THREE main chemical dosing methods at a water treatment works. (3)

4.3 Name and discuss the THREE separate products in a clarifier tank. (6)

4.4 Name SEVEN factors which influence the sedimentation process. (7)
[20]

QUESTION 5

5.1 Draw a fully labelled diagram of the pressure sand filter. (10)

5.2 What is the purpose of filtration? (4)

5.3 Write short notes under the following headings:

5.3.1 Prechlorination (3)

5.3.2 Postchlorination (3)
[20]

QUESTION 6

Draw and label a basic flow diagram of a typical water purification plant. **[15]**

TOTAL: 100

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