higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1760**(E)**(A5)T

NATIONAL CERTIFICATE

WATER AND WASTE-WATER TREATMENT PRACTICE N2

(8120022)

5 April 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
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. Sketches must be large, neat and fully labelled.
5. Write neatly and legibly.

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QUESTION 1

Give ONE word/term for each of the following descriptions. Write only the word/term next to the question number (1.1–1.5) in the ANSWER BOOK.

1.1 A quantification of bulk fluid movement

1.2 Gives an indication of bacterial pollution of water and the amount of organic material available as nutrients to bacteria

1.3 Test which is done to determine how much matter in the sample is oxidisable by using potassium permanganate

1.4 A process of treating sewage and industrial wastewaters using air and a biological floc composed of bacteria and protozoa

1.5 Is composed of many grab samples taken over a certain period of time

(5 × 1) (5)
[5]

QUESTION 2

Write short notes under the following:

2.1 Turbidity (5)

2.2 pH value (5)

2.3 Total coliform organisms (4)

2.4 Humus tanks (4)

2.5 Rotating Biological Contactors (RBCs). (5)
[23]

QUESTION 3

3.1 List FIVE general types of meters used in flow measurement of pipes. (5)

3.2 Draw a neatly labelled diagram of a Venturi tube. (5)

3.3 3.3.1 Calculate the volume of water in a half-filled cylinder with the following dimensions:

- Height = 13.5 m
- Diameter = 6.8m (5)

3.3.2 How many hours will it take to fill the tank with a pump that delivers water at a flow rate of 130 litres per minute? (5)
[20]

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QUESTION 4

4.1 Name THREE types of sedimentation tanks. (3)

4.2 Draw a labelled diagram of a pressure sand filter. (10)

4.3 What is the purpose of the activated sludge plant in comparison with a conventional biological filtration plant? (7)
[20]

QUESTION 5

5.1 Describe the different zones in breakpoint chlorination. (8)

5.2 What is anaerobic fermentation? (4)

5.3 Draw a fully labelled diagram of hydrostatic sludge removal. (5)
[17]

QUESTION 6

6.1 Write short notes under the following types of samples:

6.1.1 Composite samples (5)

6.1.2 Grab samples (5)

6.2 Briefly describe the general precautions of a measuring cylinder. (5)
[15]

TOTAL: 100

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