higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

WATER AND WASTE-WATER TREATMENT PRACTICE N2

(8120022)

4 August 2021 (X-paper)
09:00–12:00

Drawing instruments may be used.

This question paper consists of 4 pages.

185Q1G2104

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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. Start each question on a new page.
5. Use only a black or blue pen.
6. Write neatly and legibly.

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QUESTION 1

The following statements are FALSE. To correct the statement in each instance, write the correct term(s)/word(s) next to the question number (1.1–1.5) in the ANSWER BOOK.

1.1 Filtration is a physical characteristic that makes water appear cloudy when suspended matter is present.

1.2 Floc conditioning occurs when chemicals mix with the water, charges are neutralised and the individual particles are drawn together by the Van Der Waals forces which are effective when two particles pass very closely.

1.3 Steel of any kind, even stainless steel, is entirely unsuitable for storing, transporting or controlling poly-electrolytes.

1.4 Pre-sedimentation involves the chlorination of the final purified water to ensure that the water is disinfected and free from harmful bacteria.

1.5 Screening is the time needed to fill a tank or container with water flowing in at constant rate or the average time needed for a particle to flow through a tank or container.

(5 × 2) **[10]**

QUESTION 2

Choose a description from COLUMN B that matches a word or an item in COLUMN A. Write only the letter (A–F) next to the question number (2.1–2.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
2.1	Filtrate	A	nutrients and phosphates
2.2	Reticulation system	B	high quality effluents
2.3	Eutrophication	C	supply houses with fresh water
2.4	Biological filtration	D	phosphate removal
2.5	Slow sand filters	E	clear water
		F	aerobic bacteria

(5 × 1) **[5]**

QUESTION 3

3.1 Write short notes on each of the following:

3.1.1 Anaerobic fermentation (7)

3.1.2 Sludge draw-off (8)

3.2 Draw a labelled diagram of a pressure sand filter. (10)
[25]

QUESTION 4

4.1 Name FOUR types of filters that will improve the quality of effluent. (4)

4.2 Name FIVE components of hydrostatic sludge removal. (5)

4.3 List FOUR key biological and chemical stages of anaerobic fermentation. (4)

4.4 Use a labelled sketch to explain the position of a clarifier in activated sludge. (7)
[20]

QUESTION 5

5.1 Briefly discuss the following:

5.1.1 Colour in water (6)

5.1.2 Total coliform organisms. (4)

5.2 Draw a labelled flow diagram to explain the water treatment process. (10)
[20]

QUESTION 6

6.1 Name SIX methods used to introduce air into aeration basins. (6)

6.2 Describe the difference between *organic* and *inorganic* waste materials. (4)

6.3 Name FOUR methods of final disposal of sludge. (4)

6.4 Temperature is one of the important factors that can affect biological processes.

Describe the testing procedure to measure the temperature of a liquid. (4)

6.5 What is *maturation?* (2)
[20]

TOTAL: 100

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