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**higher education
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Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
WATER AND WASTE-WATER TREATMENT
PRACTICE N2

(8120022)

8 April 2020 (X-paper)
09:00–12:00

This question paper consists of 5 pages.

177Q1A2008


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.
-

QUESTION 1

The following statements are all FALSE. Correct each sentence by only writing the correct word(s) for the sentences to be TRUE, next to the question number (1.1–1.5) in the ANSWER BOOK.


- 1.1 Total viable organisms are a group of bacteria of which the faecal coliforms are a subgroup. 
- 1.2 After preliminary treatment, the next step is softening and stabilisation.
- 1.3 During clarification, disease-causing organisms are destroyed or disabled.
- 1.4 Aerobic fermentation is a series of processes in which micro-organisms break down biodegradable materials in the absence of oxygen.
- 1.5 A composite sample, also known as a catch sample consists of a single sample taken at a specific time.



(5 × 2)

[10]**QUESTION 2**

Choose a descriptive item from COLUMN B that matches 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	Turbidity	A	acidity or alkalinity
2.2	Flash mixing	B	preservative
2.3	Humus tank	C	temperature
2.4	Sodium thiosulphate	D	how clear water is
2.5	pH	E	flocculation process
		F	sedimentation

(5 × 1)

[5]

QUESTION 3

- 3.1 Copy and complete the following TABLE in the ANSWER BOOK by writing the answer next to the question number (3.1.1–3.1.8) in the ANSWER BOOK.

PARAMETER	GENERAL STANDARD	SPECIAL STANDARD
Suspended solids	3.1.1 ...	3.1.2 ...
Faecal coliforms	3.1.3 ...	3.1.4 ...
Mercury	3.1.5 ...	3.1.6 ...
Arsenic	3.1.7 ...	3.1.8 ...

(8 × 1) (8)

- 3.2 Write short notes under the following headings and give examples:

- 3.2.1 Toxic substances (4)
- 3.2.2 Flow measurement (6)
- 3.2.3 Polyelectrolytes (8)

[26]**QUESTION 4**

- 4.1 Draw a neat, fully labelled diagram of a propeller meter. (5)
- 4.2 State SEVEN advantages of magnetic flowmeters. (7)
- 4.3 Name FOUR mechanical aerators that are normally used in industry. (4)


[16]**QUESTION 5**

- 5.1 Explain the backwashing procedure for rapid gravity sand and pressure filters. (12)
- 5.2 Discuss the purpose of sedimentation. (5)
- 5.3 Name the factors which influence the stability of water. (5)

[22]

QUESTION 6


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

Calculate: 

6.1.1 The volume of the pipeline (4)

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

6.2 Write short notes on the following:

6.2.1 Grab sample  (6)

6.2.2 Composite samples (5)

[21]

TOTAL: 100