higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PROCESS TECHNOLOGY
NQF LEVEL 3

(6050353)

26 February 2020 (X-paper)
09:00–12:00

This question paper consists of 5 pages.

063Q1S2026

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

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SECTION A

QUESTION 1

Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1–1.5) in the ANSWER BOOK.

1.1 A function of impellers:

A Air movement
B Rapid dispersion
C Solid suspension
D Propelling

1.2 The rotation of a rotor produces … in a tank.

A vortex
B attrition
C bubbles
D air

1.3 Which ONE of the following does not form part of a basic flow pattern?

A Axial
B Radial
C Tangential
D Turbulent

1.4 Hot fluid inside heat exchangers enters through the …

A tube outlet.
B shell inlet.
C tube inlet.
D shell outlet.

1.5 Forced draft coolers …

A cause problems with some fans.
B push the air across the fin-tube surface.
C push the air across the bundles.
D remove heat from the system.

(5 × 1) **[5]**

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QUESTION 2

Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (2.1–2.5) in the ANSWER BOOK.

2.1 The molar mass of an element can be found on the periodic table.

2.2 When the volume is in litre, the concentration is called density.

2.3 A channel is a path that fluid in a heat exchanger is directed through.

2.4 An exothermic reaction is a reaction where energy is absorbed.

2.5 Fuel oil is a general term given to the liquid fuels derived from crude oil.

(5 × 1) **[5]**

QUESTION 3

Complete the following sentences by writing only the missing word or words next to the question number (3.1–3.5) in the ANSWER BOOK.

3.1 The … process purifies water for industrial and household uses.

3.2 … is/are formed during the coagulation and flocculation processes and then removed from the water.

3.3 A/An … gas is also called a noble gas.

3.4 The movement of molecules from a region of high concentration to a region of low concentration is known as …

3.5 … get trapped in a membrane and clog it.

(5 × 1) **[5]**

TOTAL SECTION A: 15

SECTION B

QUESTION 4

4.1	Define the term *batch mixing*.		(2)
4.2	Explain the operation of solid-removal equipment.		(6)
4.3	Give the FIVE steps to follow when collecting cream samples of viscous liquids.		(5)
4.4	Name TWO other pieces of manual sampling equipment.		(2)
4.5	List FOUR types of burners.		(4)
4.6	List FIVE hazards caused by coal-released gases that are harmful to humans.	(5 × 2)	(10)
4.7	What does the acronym LPG stand for?		(1)
			[30]

QUESTION 5

5.1	Name THREE types of cooling towers.		(3)
5.2	Explain the operation of an open-cycle cooling tower.		(5)
5.3	Name FIVE problems that can occur in cooling towers.		(5)
5.4	Give FIVE types of tools required when dismantling a cooling tower.		(5)
5.5	Define the term *combustion*.		(2)
5.6	State FOUR purposes of drying.		(4)
5.7	Name THREE configurations for drum dryers based on the number of drums.	(3 × 2)	(6)
			[30]

QUESTION 6

6.1	List THREE materials that heated drums are made of.		(3)
6.2	Explain the basic working principle of drum dryers.		(10)
6.3	Explain FOUR ways in which quality control can be done.	(4 × 2)	(8)
6.4	Briefly explain the TWO most common columns in the column method that is used for backwashing.	(2 × 2)	(4)
			[25]

TOTAL SECTION B: 85
GRAND TOTAL: 100

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