higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PROCESS TECHNOLOGY
NQF LEVEL 2

(6050342)

8 December 2020 (X-paper)
09:00–12:00

This question paper consists of 6 pages.

443Q1N2008

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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. Use 3,14 for the value of π
5. Start each section on a new page.
6. Use only a black or blue pen.
7. 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 correct answer and write only the letter (A–D) next to the question number (1.1–1.5) in the ANSWER BOOK.

1.1 … generate energy to move fluids through pipes.

A Pumps
B Valves
C Compressors
D Blowers

1.2 Centrifugal compressors are used to compress ... to fairly high pressures.

A dry gases
B wet gases
C cold gases
D hot gases

1.3 Not a type of conveyor:

A Belt conveyor
B Pneumatic conveyor
C Pressure conveyor
D Screw conveyor

1.4 … are stored before they are packed, distributed or used.

A Byproducts
B Intermediate products
C Final products
D Raw materials

1.5 ONE of the disadvantages of bulk containers is that they are …

A relatively expensive.
B not strong.
C easily damaged.
D hard to repair.

(5 × 1) **[5]**

QUESTION 2

Choose a term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–J) next to the question number (2.1–2.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
2.1	Pumps handling liquid not containing hard or abrasive solids and viscous fluids	A	gear pumps
2.2	Problems regarding pump drive equipment	B	electrical faults
2.3	Regularly spaced columns keeping fixed roof upright	C	rotary pumps
2.4	Coatings protecting against this	D	mechanical faults
2.5	Substance speeding up reaction without taking part in it	E	conical roofs
		F	roof columns
		G	corrosion
		H	enzyme
		I	catalyst
		J	galvanised

(5 × 1) **[5]**

QUESTION 3

Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (3.1–3.5) in the ANSWER BOOK.

3.1 A driving force must be applied so that the filtrate passes through the filter medium.

3.2 Particles settle easily in the transition zone.

3.3 Gravitational force is used to separate components with different densities.

3.4 Cyclones have high capital costs.

3.5 Solubility is not affected by temperature. (5 × 2) **[10]**

TOTAL SECTION A: 20

SECTION B

QUESTION 4

4.1 List FOUR things that PFDs do not indicate. (4)

4.2 Draw the symbol for each of the following equipment:

4.2.1 Compressor

4.2.2 Filter

4.2.3 Covered tank

(3 × 2) (6)

4.3 Name FOUR types of pipes normally used in process plants. (4)

4.4 Name SIX dimensions to indicate the sizes of pipes. (6)
[20]

QUESTION 5

5.1 State the THREE fundamental purposes of separation processes. (3)

5.2 Give THREE main sources of wastewater. (3)

5.3 Explain each of the following terms:

5.3.1 Screening

5.3.2 Chlorination

(2 × 2) (4)

5.4 Give THREE advantages of gear drives. (3)

5.5 Describe the use of the following pump drives in process industries:

5.5.1 Diesel motors

5.5.2 Steam turbines

(2 × 2) (4)

5.6 Explain the operation of portal reclaimers to take reclaimed material from the side face of stockpiles. (8 × 1) (8)
[25]

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QUESTION 6

6.1 What does the acronym SOP stand for? (1)

6.2 Explain how storage losses can be minimised. (7 × 1) (7)

6.3 Explain what *salvage drums* are used for. (2)

6.4 State FOUR things to do in case of spillage of a hazardous substance. (4)

6.5 What does the acronym LPG stand for? (1)
[15]

QUESTION 7

7.1 Define each of the following terms:

7.1.1 Suspended solids

7.1.2 Ionic solution

7.1.3 Slow sand filter

(3 × 2) (6)

7.2 Why is the centrifugation process called a batch process? (3)

7.3 Give FOUR disadvantages of cyclones. (4)

7.4 Write brief notes on nucleation as one of the indicators of poor performance of crystallisers. (7)
[20]

TOTAL SECTION B: 80
GRAND TOTAL: 100

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