higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PROCESS CHEMISTRY
NQF LEVEL 2

(6050422)

12 November 2024 (Y-paper)
13:00–16:00

This question paper consists of 5 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
PROCESS CHEMISTRY
NQF LEVEL 2
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 only a black or blue pen.
5. Write neatly and legibly.

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QUESTION 1

Choose a term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–L) next to the question number (1.1–1.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.1	Maximum number of specific contaminants allowed in water before it becomes unsafe	A	pre-treatment
1.2	Toxic chemical used for making glass and other ceramics and also found in some medicine	B	protons
1.3	The first stage of treatment that waste water undergoes before it is further processed	C	oxidation
1.4	A form of waste treatment where waste is dumped in one safe storage place	D	contamination limit
1.5	Positively charged particles in an atom's nucleus	E	carbon dioxide
1.6	Reaction where a substance reacts with oxygen to produce a new molecule containing one or more oxygen atom	F	quicklime
1.7	A colourless gas with a slightly acidic taste	G	selenium
1.8	A process of turning gas into a liquid state	H	diffuser
1.9	Another name for calcium oxide	I	nitrogen
1.10	Speeds up or slows down the velocity of a gas mixture so that the correct conditions are met	J	liquefaction
		K	landfill
		L	salt

(10 × 1) **[10]**

QUESTION 2

Give ONE term for each of the following descriptions by writing it next to the question number (2.1–2.5) in the ANSWER BOOK.

2.1 A material that helps lower the melting temperature of raw material in various processes.

2.2 An oxide that is used in the production of high-quality crystal glasses.

2.3 The final step in the glass melting process.

2.4 The process whereby glass is shaped into final products.

2.5 The act of looking at something carefully before any product can be sold.

(5 × 1) **[5]**

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QUESTION 3

3.1 Define the term *hydrocarbons*. (2)

3.2 Air is made up of oxygen and nitrogen and small amounts of other elements such as argon.

3.2.1 What is the percentage of oxygen and nitrogen, respectively? (2)

3.2.2 Explain how air can be recovered from the atmosphere. (3)

3.3 Write brief notes on floatation. (3)

3.4 List FOUR components of pure gases. (4)

3.5 Name SIX products of raw materials. (6)

[20]

QUESTION 4

4.1 Give FIVE common reasons for using purified water in the industry. (5)

4.2 Disinfection is one of the methods used to remove every trace of bacteria and viruses from water.

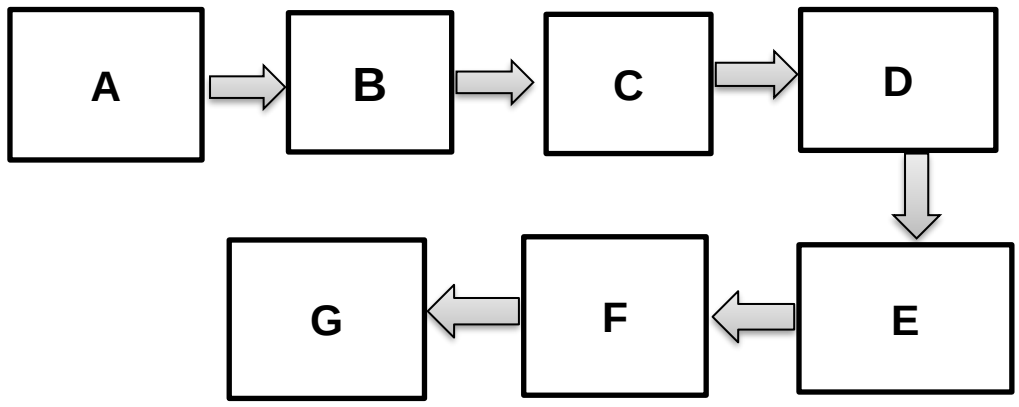
4.2.1 Define the term *potable*. (1)

4.2.2 Briefly explain how chlorine is used during disinfection. (4)

4.3 Briefly describe *reverse osmosis*. (8)

4.4 The diagram below is a process flow diagram of distillation in a demineralisation plant.

Name the parts or functions indicated on the diagram by writing the answer next to the letter (A–G) in the ANSWER BOOK.



(7 × 1) (7)

[25]

QUESTION 5

5.1 Name gases produced by the companies listed below:

5.1.1 Air Products South Africa

5.1.2 Afrox

5.1.3 Petro SA

(3 × 1) (3)

5.2 Give FOUR disadvantages of the industrial gas industry in South Africa. (4)

5.3 Draw a labelled process flow diagram of the fractional distillation of air. (8)
[15]

QUESTION 6

6.1 List and describe any TWO types of refining agents. (6)

6.2 Draw a neat, labelled process flow diagram of glass production. (9)
[15]

QUESTION 7

7.1 List FIVE types of fire extinguishers. (5)

7.2 Give the function of each personal equipment below:

7.2.1 Ear plugs

7.2.2 Safety boots

7.2.3 Face shield

7.2.4 Gloves

7.2.5 Hard hat

(5 × 1) (5)
[10]

TOTAL: 100

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