higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PROCESS CHEMISTRY
NQF LEVEL 2

(6050422)

1 March 2018 (X-Paper)
09:00–12:00

This question paper consists of 6 pages.

NCV

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. Write neatly and legibly.

NCV

QUESTION 1

1.1 1.1.1 What are precious metals? (1)

1.1.2 Name THREE examples of precious metals. (3)

1.1.3 State TWO properties of precious metals that make them more appealing. (2)

1.1.4 Name a base metal that is widely used as electrical conductor. (1)

1.1.5 Which base metal is used to make windows and door frames? (1)

1.2 State THREE uses of rubber. (3)

1.3 Natural gas is a non-renewable resource and a fossil fuel like coal and crude oil.

1.3.1 Explain how natural gas is recovered from underground. (2)

1.3.2 Name FOUR components (constituents) of natural gas. (4)

1.3.3 Name THREE industries that use natural gas in their manufacturing processes. (3)

[20]

QUESTION 2

2.1 Name FOUR ways in which different industries use water. (4)

2.2 In South Africa, there are laws that are set to protect the environment.

2.2.1 Define the term *sustainable development*. (2)

2.2.2 What is the main purpose of NEMA? (1)

2.2.3 NEMA is also responsible for setting guidelines of the principle of 'polluters must pay'.

Briefly discuss this principle. (4)

2.2.4 State THREE things for which a license is needed with regard to the use of water. (3)

2.2.5 Name FIVE ways in which water can be used for domestic purpose. (5)

2.3 Explain how COD is determined in sewage effluent. (1)

2.4 Draw a process flow diagram of a municipal waste-water treatment plant. (10)

[30]

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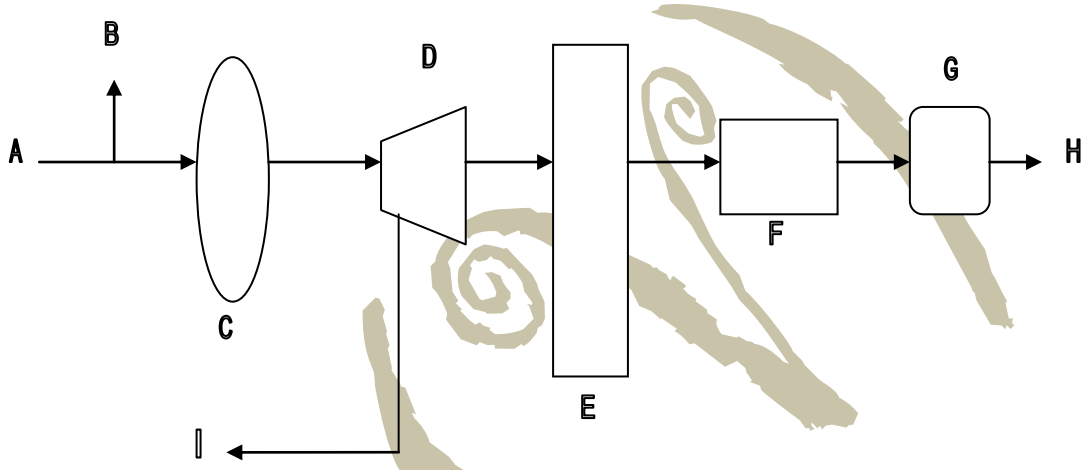
QUESTION 3

3.1 The following diagram is a process flow diagram of the fractional distillation of air.

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



(9)

3.2 Give ONE property of each of the following industrial gases:

3.2.1 Ammonia

3.2.2 Argon

3.2.3 Ozone

3.2.4 Acetylene

3.2.5 Chlorine

(5 × 1) (5)

3.3 State FOUR applications of hydrogen. (4)

3.4 Name TWO industrial gases that are used as refrigerants. (2)

[20]

QUESTION 4

4.1 The most common type of glass is soda-lime-silica or commercial glass.

4.1.1 What is the percentage of silica in commercial glass? (1)

4.1.2 Write the formula of calcium carbonate. (2)

4.1.3 Name THREE properties of commercial glass. (3)

4.1.4 State TWO uses of commercial glass. (2)

4.2 The compounds in the following table are important for the production of glass.

Write the chemical name of each formula next to the question number (4.2.1–4.2.4) in the ANSWER BOOK.

	CHEMICAL FORMULA	CHEMICAL NAME
4.2.1	SiO_2	
4.2.2	CaO	
4.2.3	Na_2SO_4	
4.2.4	Na_2CO_3	

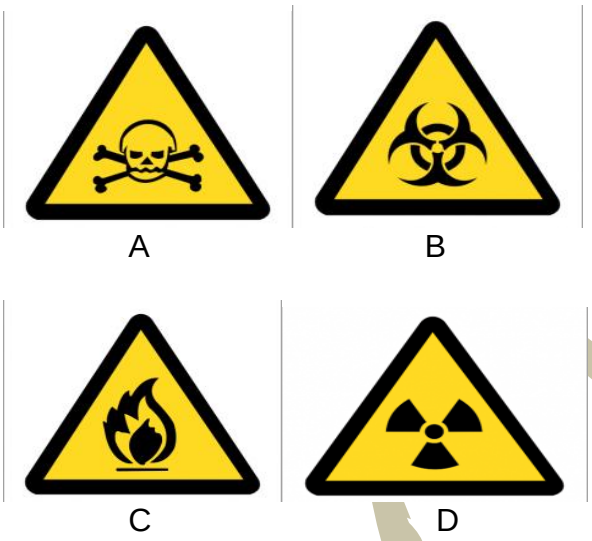
(8)

4.3 State FOUR possible faults that may be seen when glass is produced. (4)

[20]

QUESTION 5

5.1 Name the following safety signs by writing only the answer next to the letter (A–D) in the ANSWER BOOK:



A B

C D

(4 × 1) (4)

5.2 Which personal protective equipment are used for protection against the following:

5.2.1 Inhaling dust particles and gases

5.2.2 Protecting eyes against concentrated and toxic chemicals

5.2.3 Full-body protection

5.2.4 Against noise

(4 × 1) (4)

5.3 Briefly discuss *flooding* and explain how it can be prevented. (2)

[10]

TOTAL: 100

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