higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PROCESS CHEMISTRY
NQF LEVEL 2

(6050422)

2 March 2020 (Y-paper)
13:00–16:00

This question paper consists of 5 pages.

189Q1S2002

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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 only a black or blue pen.
5. Write neatly and legibly.

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QUESTION 1

Give ONE term for each of the following descriptions by writing it next to the question number (1.1–1.5) in the ANSWER BOOK.

1.1 Process of removing salt from seawater

1.2 Type of gas used in oxyacetylene welding torches

1.3 Destruction of harmful pathogens in water during a water-treatment process

1.4 Type of glass that should not be used to make food containers

1.5 Positive subatomic particles found in the nucleus of an atom

(5 × 1) **[5]**

QUESTION 2

2.1 The paper industry played a major role in shaping the South African chemical-processing industry.

2.1.1 What does Sappi stand for? (1)

2.1.2 List THREE products produced by the paper industry in South Africa. (3)

2.1.3 Briefly explain how paper is made. (3)

2.1.4 State THREE uses of paper. (3)

2.2 Agriculture is the production of food and goods by farming.

2.2.1 What are agroproducts? (1)

2.2.2 List FIVE examples of agricultural products. (5)

2.3 Briefly explain how natural gas is recovered. (4)

[20]

QUESTION 3

3.1 Give the symbol for each of the following chemical elements and compounds:

3.1.1 Calcium sulphate

3.1.2 Copper

3.1.3 Iron chloride

3.1.4 Manganese

3.1.5 Aluminium sulphate

(5 × 1) (5)

3.2 Give the unit in which each of the following is measured:

3.2.1 Turbidity

3.2.2 Concentration

3.2.3 pH

(3 × 1) (3)

3.3 List FIVE sources of water. (5)

3.4 Give FOUR examples of diseases that are transmitted through water. (4)

3.5 Write brief notes about reverse osmosis. (5)

3.6 Draw a labelled flow diagram of the reverse-osmosis process. (5)

[27]

QUESTION 4

4.1 Carbon dioxide is one of the components in the atmosphere used by plants through photosynthesis.

4.1.1 What is the percentage carbon dioxide in air? (1)

4.1.2 List FOUR physical properties of carbon dioxide. (4)

4.1.3 Define the term *photosynthesis*. (2)

4.1.4 List THREE gases that are classified as greenhouse gases. (3)

4.1.5 State FIVE industrial applications of carbon dioxide. (5)

4.2 Briefly explain the procedure for filling gas cylinders. (4)

[19]

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QUESTION 5

5.1 Borosilicate glass was invented by Scott Otto and is also known as Pyrex.

5.1.1 Give the percentage of silica and boric oxide in borosilicate glass. (2)

5.1.2 Explain why borosilicate glass is used where temperatures may rise and fall drastically. (1)

5.1.3 Give FOUR industrial applications of borosilicate glass. (4)

5.2 Give the colour that each of the following compounds impart in glass:

5.2.1 Cobalt sulphate

5.2.2 Iron sulphide

5.2.3 Selenium

5.2.4 Iron chromite

(4 × 1) (4)

5.3 Discuss the manufacturing process of float glass. (6)

5.4 Give TWO faults that may exist when glass is produced. (2)

[19]

QUESTION 6

6.1 Name the type of fire extinguisher used to extinguish each of the following fires:

6.1.1 Fire caused by a stack of papers

6.1.2 Fire caused by a faulty electrical cable

6.1.3 Flammable liquid caught fire in a plant

6.1.4 Accident of a petrol tanker that caught fire afterwards

6.1.5 Burning oil and fats in a commercial kitchen

(5 × 1) (5)

6.2 Industries that use chemicals and other toxic substances generate empty and used containers.

6.2.1 Explain why holes must be punched on empty used chemical containers. (2)

6.2.2 List THREE disposal methods for empty containers. (3)

[10]

TOTAL: 100

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