higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PROCESS TECHNOLOGY
NQF LEVEL 3

(6050353)

7 November 2018 (X-Paper)
09:00–12:00

Scientific calculators may be used.

This question paper consists of 4 pages.

NCV

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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. Write neatly and legibly.

NCV

QUESTION 1

1.1 Define the *viscosity of material*. (2)

1.2 List THREE reasons for poor mixing. (3)

1.3 A small amount of liquid taken from the flocculation tank was sent to a laboratory to find out if it conforms to the specifications.

1.3.1 Identify the process used to take the amount of liquid. (2)

1.3.2 Name THREE purposes of the process in QUESTION 1.3.1. (3)

1.4 A slot sampler is ideal for taking a large-volume, cross-sectional sample from a container.

Give step-by-step procedures on how to use a slot sampler. (5)

1.5 Calculate the final concentration of a mixture made up of 90 L of water, with 2 m NaCl mixed with 10 L of water having a 30-m salt solution. (10)

1.6 State FIVE applications of spray dryers. (5)
[30]

QUESTION 2

2.1 Name the dryer that uses both the direct and the indirect contact method. (1)

2.2 Describe the effect of a blockage on the performance of the dryer. (5)

2.3 List the FOUR advantages of dehumidifiers. (4)

2.4 Name THREE main classifications of adsorption. (3)

2.5 Name the TWO opposing forces on which the mechanics of attraction depends. (2)

2.6 Write brief notes on a calcium oxide desiccant. (5)
[20]

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QUESTION 3

3.1 Explain the operation of a horizontal flow clarifier. (9)

3.2 What does the abbreviation CCC stand for? (1)

3.3 Fouling occurs when organic, colloidal and suspended particles are trapped in the pores of membranes.

List FOUR different types of foulants. (4)

3.4 Explain briefly why heaters are commonly referred to as direct-fired heaters. (2)

3.5 Give FOUR examples of materials produced in a kiln. (4)

3.6 Indicate whether the following statement is TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (3.6) in the ANSWER BOOK.

Another name for a *stack* is a chimney. (2)

3.7 Name FOUR components of a typical gas burner and state their functions. (8)

[30]

QUESTION 4

4.1 List NINE components of the shell-and-tube heat exchanger. (9)

4.2 Biological fouling is the deposits, attachment and growth of biological organisms on heat exchangers.

Explain how the build-up of biological foulants on heat exchangers can be removed or prevented. (6)

4.3 List FIVE benefits of using an air-cooled heat exchanger (ACHE). (5)

[20]

TOTAL: 100

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