CHIETA
INNOVATING FOR IMPACT

An innovation leader in education and training

Chemical Production Machine Operator, NQF 2
SAQA ID: 117307
EISA Tools – Written Paper 2

@chietasa @chieta_sa @chieta_sa

EXTERNAL INTEGRATED SUMMATIVE ASSESSMENT

CHEMICAL PRODUCTION MACHINE OPERATOR

Theory Memorandum 2A

Candidate Full Names	
Identity Number	
EISA Registration Number	
Assessment Centre	
Accreditation Number	
Qualification	**Chemical Production Machine Operator**
SAQA ID	**117307**
NQF Level	**2**
Credits	**134**
Paper Number	**2**
Date of EISA dd/mm/yyyy	
Duration	**2 HOURS**
Total Marks	**100**
Pass Marks	**60%**

npar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

GENERAL EISA RULES

1. Students are only allowed to use the supplied EISA booklets.
2. Students are only allowed to use a black pen for their answers.
3. Students to ensure that their name, surname and EISA registration number appears on the front of your EISA booklet.
4. This is a closed book examination; therefore, no other material or belongings are to be brought into the assessment centre. Should you bring any other material or belongings into the assessment centre, you will be required to leave such at the front of the assessment centre examination room. The assessment centre will not be held liable for any loss or damage to property brought into the assessment centre examination room.
5. All EISA booklets must be handed back to the invigilator intact. No pages may be torn off from the EISA booklet. The removal of EISA booklets from the examination room is prohibited.
6. Students may make use of a calculator in this EISA.
7. Unless this is an online examination where access to a computer will be made available to you; the use of any communication devices, including smart watches, cell phones, tablets, iPads, headphones and laptops are prohibited.
8. All cell phones are to be switched off for the duration of the EISA.
9. The invigilator will not assist you with the explanation of questions related to the EISA.
10. Students are prohibited from conversing in any manner with other students.
11. Students may not leave the examination venue within one hour of the start of the examination and in the last 10 minutes of the allotted examination period.
12. Students who are found to be disruptive and unruly in the assessment centre will be requested to leave the assessment centre by the invigilator.

I HEREBY CONFIRM THAT I HAVE READ THE ABOVE EISA RULES AND DECLARE THAT I UNDERSTAND AND ACCEPT THE RULES.

Student Signature…… Date Signed……

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

CANDIDATE INSTRUCTIONS

- **Candidate must complete all question s in the EISA**
- **Candidates must ensure that they use only a black pen when completing this EISA.**
- **Candidate should ask the invigilator for additional paper should they need more space to write.**
- **Candidate must ensure that they indicate their Name, Surname and EISA registration number the top of the additional paper.**

  Also ensure that the question number is clearly marked on your additional paper.

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

Question 1

1.1.

Process Flow

Review SOPs & PPE → Inspect Equipment → Power On & Set Parameters → Feed Materials & Monitor → Track & Adjust → Shutdown & Clean → Record Reports

1.1.1.A.	Answer the following questions	(5 Marks)
I.	**List 3 ways to pre-set reactor process variables.**	**(3 Marks)**
	Learner to list any 3 1. Calibrate instruments 2. Set temperature, pressure and flow rates 3. Activate alarms/interlocks 4. Perform a dry run.	
II.	**List two reasons for testing alarms and interlocks during pre-startup.**	**(2 Marks)**
	1. To detect unsafe conditions 2. Prevent accidents or equipment damage.	

(5 Marks)

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

1.1.1.B.	State whether the following statements are true or false			(5 Marks)
Statement		**Answer**		**Marks**
I.	All required utilities, like water, steam, and compressed air, should be checked before startup	True	False	1
II.	Calibration of temperature, pressure, and flow instruments can be skipped if the equipment looks clean.	True	False	1
III.	Housekeeping and removing obstacles around equipment is part of pre-startup preparation.	True	False	1
IV.	Documentation and supervisor sign-off are not necessary if the operator is experienced.	True	False	1
V.	Testing emergency shutdown systems is part of ensuring process safety during pre-startup.	True	False	1

(5 Marks)

1.1.2.	Discuss the operations and functions of the chemical manufacturing equipment mentioned below. (10 Marks)
Equipment	**Functions and Operations**
I. Reactor (2 Marks)	is a vessel where chemical reactions take place and it is designed to provide the necessary conditions such as temperature, pressure, and residence time for the desired reaction to occur

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

II. Distillation Column (2 Marks)	is a separation process used to separate two or more components from a liquid mixture based on their different boiling points
III. Heat Exchanger (2 Marks)	is a device used to transfer heat between two or more fluids at different temperatures. It enables efficient heat transfer while maintaining the separation of the fluids.
IV. Distillation Column (2 Marks)	is a unit used to separate different phases of a mixture, such as liquid-liquid or gas-liquid separation. They exploit differences in density, particle size, or inertia to achieve separation.
V. Reactor Furnace (2 Marks)	is employed to provide the necessary heat for endothermic reactions. These furnaces use burners or heating coils to raise the temperature of reactants to the desired level.

(10 Marks)

1.1.3.A.	**Choose the correct answer and write it in the space provided**	**(5 marks)**
Statement(s)	**Answer**	**Marks**
I. Before starting up plant equipment, which of the following should be checked first? A. Start the equipment immediately B. Review SOPs, equipment manuals, and safety guidelines C. Perform production without inspection D. Record process data only after start-up	B	1

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

II. What is the purpose of performing pre-start checks on equipment? A. To delay production B. To ensure sensors, gauges, and safety devices are functioning properly C. To skip SOP requirements D. To finalize reports	B	1
III. Gradually increasing operational parameters during start-up is important because: A. It ensures the equipment warms up safely and avoids damage B. It reduces the need for PPE C. It skips quality checks D. It decreases monitoring requirements	A	1
IV. Which of the following is a key action during the verification stage after start-up? A. Ignore instrument readings B. Conduct sampling/testing to confirm product specifications C. Remove PPE D. Shut down equipment immediately	B	**1**
V. What should a machine operator do if an abnormal reading is observed during start-up?	B	1

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

A. Continue operating without action B. Adjust controls according to SOP and inform supervisor if required C. Shut down the plant without documentation D. Record it later and continue		

(5 Marks)

1.1.3.B.	**Indicate whether the following statement is True or False, circle the correct answer. (5 Marks)**

Statement(s)	Answers		Marks
a. Pre-start checks include inspecting equipment for leaks, damage, and abnormal wear.	True	False	1
b. It is acceptable to skip SOPs if the operator has experience with the equipment.	True	False	1
c. Raw material quality verification is part of the equipment start-up procedure	True	False	1
d. Control systems should be activated after the equipment is fully shut down.	True	False	1
e. All start-up actions should be documented, including parameter settings and initial observations.	True	False	1

(5 Marks)

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

1.1.3.C	Match the column A with Column B		(5 Marks)
Column A		**Column B**	**Answer**	**Mark**
I.	Review SOPs & Safety Guidelines	A. Gradually increase operational parameters to target levels	**C**	**1**
II.	Pre-Start Equipment Check	B. Ensure measuring instruments, sensors, and safety devices are functional	**B**	**1**
III.	Parameter Setting	C. Check manuals, specifications, and safety requirements before starting	**D**	**1**
IV.	Gradual Start-Up	D. Configure machine parameters like temperature, pressure, and flow	**A**	**1**
V.	Verification & Documentation	E. Record initial readings, adjustments, and confirm compliance	**E**	**1**

(5 Marks)

1.1.4.A.	Choose the correct answer and write it in the space provided	(5 marks)
Statement(s)	**Answer**	**Marks**
I. Before starting a batch, a machine operator should: A) Skip checking instruments if they look fine B) Verify batch instructions, check equipment, and ensure safety devices are functional C) Start the reactor immediately to save time D) Only wear PPE if chemicals look hazardous	B	1

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

II. Which of the following is a key process variable that must be monitored during chemical production? A) Temperature B) Flow rate C) pH D) All of the above	D	1
III. If a reactor temperature rises above the specified limit, the operator should: A) Continue operation and hope it stabilizes B) Immediately stop the reactor if unsafe, investigate the cause, and notify the supervisor C) Ignore the reading and record it later D) Add more raw material to balance the temperature	B	1
IV. Which of the following is NOT part of recording deviations during the manufacturing process? A) Date and time of deviation B) Observed parameter and its value C) Actions taken to correct the deviation D) Personal opinion on the quality of the operator	D	**1**
V. Why is continuous monitoring of process variables important? A) To ensure safety and product quality	A	1

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

B) To impress supervisors C) To reduce the need for batch documentation D) To skip lab testing		

(5 Marks)

1.1.4.B.	Answer the following questions	(5 marks)

I. List two steps to consider before starting a batch (2 Marks)

Learner to list any 2

1. Check batch card
2. Verify equipment and instruments
3. Ensure safety devices work
4. Wear appropriate PPE.

II. **List three actions to take if temperature deviates out of specification (3 Marks)**

Learner to list any 3

1. Stop equipment if unsafe
2. Investigate root cause,
3. Record deviation
4. Notify supervisor
5. Adjust the batch as per the standard operating procedure.

(5 Marks)

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

1.1.5.A.	Choose the correct answer and write it in the space provided	(5 marks)
Statement(s)	**Answer**	**Marks**
I. What is the FIRST step in an emergency shutdown? A. Notify maintenance B. Follow the gradual shutdown sequence C. Immediately activate the emergency stop system D. Collect final process data	C	1
II. Which shutdown type requires Lockout/Tagout (LOTO) to prevent accidental startup? A. Normal shutdown B. Maintenance shutdown C. Emergency shutdown D. None of the above	B	1
III. Normal shutdown procedures typically include: A. Rapidly cutting all power sources B. Stopping the process gradually following SOP steps C. Ignoring process parameters during shutdown D. Immediately isolating equipment without checks	B	1
IV. During an emergency shutdown, operators should: A. Continue operating until the supervisor arrives B. Ignore alarms unless multiple alarms occur	C	**1**

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

C. Evacuate the area if required after initiating emergency stop D. Collect all production samples first		
V. What is the purpose of documenting a shutdown? A. To provide historical records for audits and root-cause analysis B. To slow down the shutdown process C. To replace the need for an SOP D. To avoid communication with supervisors	A	1

(5 Marks)

1.1.5.B.	**Indicate whether the following statement is True or False, circle the correct answer. (5 Marks)**		
Statement(s)		**Answer**	**Marks**
I.	Emergency shutdown procedures must be performed immediately without waiting for supervisor approval	True / False	1
II.	Normal shutdown procedures follow a controlled, step-by-step sequence as outlined in the SOP.	True / False	1
III.	During maintenance shutdowns, equipment can remain energized as long as the operator is experienced.	True / False	1
IV.	In all shutdown types, documentation is optional	True / False	1
V.	Emergency shutdowns may bypass standard sequences if the safety of personnel or equipment is at risk.	True / False	1

(5 Marks)

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

1.2. Parameter in chemical plant

Parameter	Start of Shift (06:00)	End of Shift (18:00)	Target Range
Temperature	78°C	76°C	75–80°C
Pressure	2.1 bar	2.0 bar	2.0–2.5 bar
Agitator Speed	450 rpm	460 rpm	400–500 rpm
Feed Flow (Catalyst)	12 L/hr	11 L/hr	10–15 L/hr
pH	6.8	6.7	6.5–7.0

1.2.	Referring to the parameter answer the following questions	(10 Marks)

1.2.1. State two advantages of comparing process parameters at the beginning and end of a shift when filling out the report (4 Marks)

1. Comparing start and end readings helps the operator to identify trends, deviations, or developing issues during the shift.
2. It confirms whether the process remained stable and within operational limits.

1.2.2. Explain three key reasons for monitoring process parameters (6 Marks)

1. Trend monitoring helps identify gradual deviations before they become critical, allowing for proactive adjustments.
2. Operators can anticipate process issues, maintain consistent product quality, optimise efficiency, reduce waste, and ensure compliance with safety and operational standards.
3. Regular logging and reviewing of trends are essential for decision-making and continuous improvement.

(/ 10 Marks)

(/ 65 Marks)

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

Question 2

2.1. Workplace scenario

	Density	pH	Viscosity
Specification	0.85 ± 0.02 g/cm³	**6.5 – 7.5**	**15 - 20cP**
Actual Lab Results	0.88 g/cm³	**6.8**	**22cP**

2.1.1	Answer the following question	(3 Marks)

I. List the three possible reasons for density to be higher than the specification (3 Marks)

1. Acid concentration (%)
2. pH level
3. Appearance (clear, no sediment)

(3 Marks)

2.1.2	Answer the following question(s)	(2 marks)

I. List two OHS measures to follow when collecting samples from the tank. (2 marks)

Learner to list any 2

1. Wear PPE (gloves, goggles, lab coat),
2. Perform work in a well-ventilated area
3. Avoid direct contact or inhalation of vapours,
4. Prevent spills,
5. Label containers properly.

(2 Marks)

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

2.1.3.A	Choose the correct answer and write it in the space provided	(5 marks)
Statement(s)	**Answer**	**Marks**
I. Which sampling apparatus is most suitable for collecting liquid samples from a pressurized pipeline? A. Glass bottle B. Dipper sampler C. In-line sample valve D. Scoop	C	1
II. What is the main purpose of flushing a sampling point before taking a sample? A. To increase the sample volume B. To remove stagnant material and ensure a representative sample C. To sterilize the sampling container D. To lower the temperature of the sample	B	1
III. Which of the following is an advanced sampling technique used to obtain an average of a process over time? A. Grab sampling B. Composite sampling C. Scoop sampling D. Pipette sampling	B	1
IV. **A Gas Sampling Bag (Tedlar bag) is primarily used for:**	C	**1**

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

A. Collecting solids in bulk B. Sampling liquids under high pressure C. Collecting gaseous emissions or VOCs D. Sampling highly viscous liquids		
V. Which of these is a key advantage of using a closed-loop sampler? A. It reduces the sample volume needed B. It allows sampling without operator exposure to hazardous chemicals C. It is cheaper than manual sampling D. It does not require calibration	B	1

(5 Marks)

2.1.3.B.	**Indicate whether the following statement is True or False, circle the correct answer. (5 Marks)**			
Statement(s)		**Answer**		**Marks**
I.	Pre-start checks include inspecting equipment for leaks, damage, and abnormal wear.	True	False	1
II.	It is acceptable to skip SOPs if the operator has experience with the equipment.	True	False	1
III.	Raw material quality verification is part of the equipment start-up procedure	True	False	1

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

IV.	Control systems should be activated after the equipment is fully shut down.	True	False	1
V.	All start-up actions should be documented, including parameter settings and initial observations.	True	False	1

(5 Marks)

2.1.4.1	**Match the column A with Column B**		**(5 Marks)**
Column A		**Column B**	**Answer**	**Mark**
I.	Flushing the sampling point	A. Ensures safe disposal of hazardous waste	**B**	**1**
II.	Labelling the sample container	B. Removes stagnant material ensuring a representative sample	**C**	**1**
III.	Controlled sample storage	C. Keeps sample traceable to batch and operator	**E**	**1**
IV.	Viscosity out of specification	D. Investigation required to determine cause	**D**	**1**
V.	Discarding sample into waste drum	E. Maintains sample integrity before testing	**A**	**1**

(5 Marks)

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

2.2. Mpho, a machine operator, samples a liquid cleaning solution from the production line to verify quality. She performs:

- **pH test** using litmus paper and a digital pH meter (spec: 6.5–7.5)
- **Viscosity check** with a viscometer (spec: 15–20 cP)
- **Density measurement** with a hydrometer (spec: 0.85 ± 0.02 g/cm³)
- **Dimensional check** on bottles using a calliper
- **Visual inspection** for clarity, colour, and particles

2.2.1.A.	**Choose the correct answer and write it in the space provided**	**(5 marks)**
Statement(s)	**Answer**	**Marks**
I. What device does Mpho use to measure viscosity? A. Hydrometer B. Viscometer C. Calliper D. Litmus paper	B	1
II. What is the correct pH range for the solution in the scenario? A. 5.0 – 6.0 B. 6.5 – 7.5 C. 7.5 – 8.5 D. 4.5 – 5.5	B	1
III. Which action should Mpho take if the test results are out of specification?	B	1

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

A. Record and ignore B. Inform the supervisor C. Continue production D. Adjust the results manually		
IV. Which test is done using a calliper? A. Bottle dimensions B. Viscosity C. pH D. Density	A	**1**
V. What is the reason for performing visual inspection? A. To verify pH B. To detect clarity, colour, or particles C. To measure density D. To check viscosity	B	1

(5 Marks)

2.2.1.B.	**Match the column A with Column B**		**(5 Marks)**
Column A	**Column B**	**Answer**	**Mark**
I. Litmus paper / pH meter	A. Measures viscosity	**B**	**1**
II. Viscometer	B. Checks pH of the solution	**A**	**1**
III. Hydrometer	C. Measures density	**C**	**1**

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

IV. Calliper	D. Detects clarity, colour, or particles	**E**	**1**
V. Visual inspection	E. Checks bottle dimensions	**D**	**1**

(5 Marks)

2.2.1.C.	**Indicate whether the following statement is True or False, circle the correct answer. (5 Marks)**			
Statement(s)		**Answer**		**Marks**
I.	Mpho uses a viscometer to check the pH of the solution	True	False	1
II.	Personal protective equipment (PPE) must be worn during sampling and testing.	True	False	1
III.	Density of the solution is measured using a hydrometer.	True	False	1
IV.	Any out-of-spec results should be ignored if the batch looks fine visually	True	False	1
V.	A calliper is used to check the dimensions of the bottles.	True	False	1

(5 Marks)

(35 Marks)

…… TOTAL 100 MARKS……..……

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

Marks Allocation Grid (For use by Assessor Only)

Question 1	Marks	Allocated Marks
1.1.1	10	
1.1.2	10	
1.1.3	15	
1.1.4	10	
1.1.5	10	
1.2.1	10	
Total Question 1	**65**	
Question 2	**Marks**	**Allocated Marks**
2.1.1	3	
2.1.2	2	
2.1.3	10	
2.1.4	5	
2.2.1	15	
Total Question 2	**35**	
Total marks obtained		
Percentage obtained		

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | Toll Free Line: 0800 111 173

Assessor Details

Assessor Name and Surname	
Registration Number	
Signature	
Date	

Moderator Details

Moderator Name and Surname	
Registration Number	
Signature	
Date	

Exemplar

CHIETA HEAD OFFICE:
Tel: 011 628 7000
72 New Road, Glen Austin AH (Grand Central), Midrand, 1685

WESTERN CAPE
Tel: 021 551 1113/4
Unit B2, Cnr Race Course & Omuramba Roads, Montague Gardens, 7441

KWAZULU-NATAL
Tel: 031 368 4040
1 The Boulevard, Westway Office Park, Block D, Westville, Durban, 3630

PORT ELIZABETH
Tel: 041 509 6478
Struanway Block E, New Brighton, Port Elizabeth, 6001

@CHIETA_SETA @chietasa @chieta_sa www.chieta.org.za

Anti-Fraud Line: 0800 333 120 | **Toll Free Line:** 0800 111 173