Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3171304 Date:16-12-2023

Subject Name: Cleaner Production and Waste Utilization

Time: 10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define Cleaner Production.	**03**
	(b)	Explain need for Cleaner Production.	**04**
	(c)	Evaluate the 16 tasks which have to be performed in CP methodology implemented in the Chemical Industry.	**07**
Q.2	**(a)**	Explain objectives of Energy audit.	**03**
	(b)	Enlist various instruments use for the Energy Audit.	**04**
	(c)	Explain the steps for Preliminary Energy Audit.	**07**
		OR	
	(c)	Explain the steps for Detailed Energy Audit.	**07**
Q.3	**(a)**	Write down various benefits of Cleaner Production in industry.	**03**
	(b)	According to you, which step is most important in the CP methodology? Justify your answer.	**04**
	(c)	Enlist and explain the checklist for Good Housekeeping.	**07**
		OR	
Q.3	**(a)**	Give classification of Cleaner Production Tools.	**03**
	(b)	Express the coverage of Financial Analysis in Cleaner Production.	**04**
	(c)	Enlist and explain barriers for implementation of Cleaner Production in industry.	**07**
Q.4	**(a)**	What is Heat recovery? Write down the application of the heat recovery.	**03**
	(b)	Write down various types of heat exchanger.	**04**
	(c)	Explain Heat Recovery Boiler.	**07**
		OR	
Q.4	**(a)**	What is Heat loss? How can you quantify the heat loss?	**03**
	(b)	Write down various types of heat recovery System.	**04**
	(c)	Explain Shell and Tube Heat Exchanger.	**07**
Q.5	**(a)**	What is Recycling and Reuse?	**03**
	(b)	Explain one case study related the recycling option for solid waste.	**04**
	(c)	Explain one case study related the recycling option for liquid waste.	**07**
		OR	
Q.5	**(a)**	Discuss factors affecting selection of CP solution.	**03**
	(b)	Why material balance is required for Cleaner Production?	**04**
	(c)	Derive equation of LMTD for various flow arrangements.	**07**

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