Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII EXAMINATION – WINTER 2025

Subject Code:3171304 Date:28-11-2025

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)**	Write down the concept of sustainable CP.	**03**
	(b)	Discuss the hierarchy of cleaner production.	**04**
	(c)	"Waste Heat Recovery is useful for prevention and control of pollution." Justify with example.	**07**
Q.2	**(a)**	Explain how CP is a continuous process and not a onetime activity.	**03**
	(b)	What are the hurdles to the implementation of CP in industry?	**04**
	(c)	How CP tools are effective in pollution reduction?	**07**
		OR	
	(c)	Discuss with respect to CP: (i) Technical feasibility (ii) Evolution of Environmental Aspects (iii) Economic Viability.	**07**
Q.3	**(a)**	How can government policies support cleaner production?	**03**
	(b)	Write brief note on "Difficulty in assessing the Cleaner Technology".	**04**
	(c)	Explain step by step methodology to implement cleaner production practice in chemical industry.	**07**
		OR	
Q.3	**(a)**	Explain the CP concept of "Creation of Useful Byproduct".	**03**
	(b)	Write importance of material and energy balance.	**04**
	(c)	Explain with example how CP is useful in Fertilizer industry.	**07**
Q.4	**(a)**	Name three kinds of recycling, give typical examples	**03**
	(b)	State any four CP opportunities can be implemented by paper industry.	**04**
	(c)	Differentiate between Energy audit and financial audit with respect to CP	**07**
		OR	
Q.4	**(a)**	Explain the concept of "zero waste".	**03**
	(b)	How waste heat utilization is useful for the industry?	**04**
	(c)	Define waste heat recovery. give benefits of heat recovery in steam boiler.	**07**
Q.5	**(a)**	Discuss sources of waste heat generated in different types of industries.	**03**
	(b)	Write a short note on heat wheel.	**04**

	(c)	Briefly discuss with neat sketch heat recovery boiler with two stacks and with fan.	**07**

OR

Q.5	**(a)**	What do you mean by "Onsite Recycle & Recover"?	**03**
	(b)	How waste heat is useful? Discuss types of heat recovery equipment's.	**04**
	(c)	What do you mean by the term LMTD? Draw the temperature profiles for concurrent, counter current flow and parallel flow.	**07**

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