Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–V EXAMINATION – WINTER 2025

Subject Code:3150506 Date:27-11-2025

Subject Name:Chemical Process Plant Design & Economics

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)**	Discuss in brief role of a Chemical Engineer in process design of chemical plants	**03**
	(b)	Differentiate between Standard and Special equipment.	**04**
	(c)	How does a pilot plant help in gathering information for full scale operation? Is it advisable to dismantle the pilot plant once the full scale operation gets started?	**07**
Q.2	**(a)**	Discuss any three safety aspects to be considered in chemical industry.	**03**
	(b)	Write a brief note of types of flow diagrams used in process industry.	**04**
	(c)	With suitable example discuss about various factors to be considered in selection of location of a chemical production plant	**07**
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	(c)	Explain factors affecting process selection.	**07**
Q.3	**(a)**	Sketch an ideal plant layout.	**03**
	(b)	Write a brief note on various types of piping used in process industry	**04**
	(c)	What are the different components required in the specification sheet for heat exchanger	**07**
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Q.3	**(a)**	List principles of plant layout	**03**
	(b)	Write a note on types of valves and its selection criteria.	**04**
	(c)	Explain about different types of water and steam used as utilities in chemical process industries.	**07**

Q.4	**(a)**	What is cost index? Explain any two cost index used globally.	**03**
	(b)	Outline the method for evaluation of total product cost showing the individual components	**04**
	(c)	Explain break-even point with a diagram. Discuss the importance of break even analysis	**07**

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Q.4	**(a)**	Write a short note on critical path method (CPM).	**03**
	(b)	Define depreciation. List methods for determining depreciation	**04**
	(c)	Enlist various methods of profitability analysis used to evaluate the project cost. Explain any two methods in detail	**07**
Q.5	**(a)**	Draw neat figure showing cumulative cash position for an industrial operation neglecting time value of money.	**03**
	(b)	Write a short note on program evaluation and review technique (PERT).	**04**
	(c)	Discuss importance of evaluation of alternative investment with example.	**07**

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Q.5	**(a)**	Explain six-tenths factor rule.	**03**
	(b)	Discuss planning of project schedule by 'BAR CHART' in detail	**04**
	(c)	Explain cash flow for industrial operation by drawing tree diagram	**07**

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