

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:2160503****Date:17-05-2024****Subject Name:Process Equipment Design -I****Time:10:30 AM TO 01:30 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 equivalent length, schedule Number and pipe thickness	03
	(b) Write a brief note on NPSH for centrifugal pumps	04
	(c) Discuss the steps for process design of Shell and Tube Heat Exchangers	07
Q.2	(a) Why expansion joint is provided in fixed tube sheet heat exchanger?	03
	(b) Explain giving reason which condenser position is preferred in film wise condensation	04
	(c) Discuss in brief about fluid allocation for shell and tube heat exchanger.	07
OR		
	(c) Discuss in detail about criteria of selection between kettle type and thermosyphon reboiler.	07
Q.3	(a) How reflux ratio affects distillation column design	03
	(b) Discuss in brief about vacuum distillation	04
	(c) Write short note on selection of key components in multicomponent distillation.	07
OR		
Q.3	(a) Discuss two criteria of selection for Tray tower and Packed tower in distillation	03
	(b) Explain in short –Jet flooding and Down comer Flooding.	04
	(c) Discuss the criteria of Selecting Operating Pressure in distillation	07
Q.4	(a) How distribution coefficient affects liquid liquid extraction	03
	(b) Classify industrially important extractors.	04
	(c) Discuss with equation about Fenskey-Underwood's-Gilliland method	07
OR		
Q.4	(a) Discuss about selectivity in extraction	03
	(b) Explain the properties of the solvent need to be consider while selecting suitable solvent for extraction operation	04
	(c) Discuss the steps for process design of counter current multistage extractor.	07
Q.5	(a) State and discuss in short the various types of Liquid Distributors	03
	(b) Discuss the criteria for selection of any two absorption equipments.	04
	(c) Discuss in brief Random and Regular packing	07
OR		
Q.5	(a) Discuss in brief about Rasching ring, Berl saddle, Pall ring	03
	(b) Draw falling film type absorber and explain its advantages and disadvantages over the adiabatic type packed tower	04
	(c) Discuss about the Liquid redistributors, Packing support and Hold-down plate for packed tower type absorber.	07
