

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2024****Subject Code: 3170516****Date: 30-05-2024****Subject Name: Process Auxiliaries and utilities****Time: 02:30 PM TO 05:00 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.

		MARK
Q.1	(a) Explain hardness of water.	03
	(b) List challenges involved for the management of utilities.	04
	(c) Relates NPSH values and location of pump with pumping cost.	07
Q.2	(a) Classify the vacuum pumps.	03
	(b) Justify valve selection is based on uses.	04
	(c) Classify the air compressors. And explain in detail any one from dynamic type air compressor.	07
	OR	
	(c) List method used for vacuum development and explain anyone in detail.	07
Q.3	(a) Explain air receiver.	03
	(b) Prepare P & ID for any process with all required arrangements.	04
	(c) Discuss chemical softening methods for hard water.	07
	OR	
Q.3	(a) Explain air dryer.	03
	(b) List major factors which to consider before selecting the pipe size.	04
	(c) Prepare drinking water treatment flow sheet and explain the need of each steps.	07
Q.4	(a) Justify the need of air compressor in the industry.	03
	(b) List the components involved in instrument air system.	04
	(c) Differentiate non steam heating and steam heating process.	07
	OR	
Q.4	(a) Justify the need of ejector for utility economy.	03
	(b) Explain the scope of material handling in the industry.	04
	(c) Differentiate steam generation and steam economy.	07
Q.5	(a) Discuss principle and working of thermic fluid heater.	03
	(b) List all utilities used in chemical plants.	04
	(c) Explain pipe insulation and list insulating materials with temperature limitation.	07
	OR	
Q.5	(a) Brief on steam trap.	03
	(b) Discuss the use of nitrogen as chilling utility.	04
	(c) Explain steam pipe line with its required fittings and ancillaries.	07
