

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-III (NEW) EXAMINATION – SUMMER 2024****Subject Code:3131306****Date:29-06-2024****Subject Name: Unit Operations & Processes in Chemical Industries****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**

<b>Q.1</b>	(a) Define unit operation & give the classification of unit operation.	<b>03</b>
	(b) Differentiate between Absorption & Adsorption as unit operation.	<b>04</b>
	(c) Discuss the importance of these subject in environmental engineering field.	<b>07</b>
<b>Q.2</b>	(a) Write down the chemistry of Nitric acid production.	<b>03</b>
	(b) Enlist the types of absorbers used in chemical industry & draw a neat sketch of anyone.	<b>04</b>
	(c) Draw a manufacturing flow diagram of Ethanol production & identify the sources of pollution.	<b>07</b>
<b>OR</b>		
	(c) Draw a manufacturing flow diagram of urea production & identify the sources of pollution.	<b>07</b>
<b>Q.3</b>	(a) Differentiate between distillation & evaporation.	<b>03</b>
	(b) Discuss the health & safety aspects during acetic acid manufacturing.	<b>04</b>
	(c) Write down the manufacturing process of furfural along flow diagram.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Explain the factors influencing the rate of evaporation.	<b>03</b>
	(b) Name the various factors affecting stripping operation & discuss each in detail.	<b>04</b>
	(c) Write down the manufacturing process of Monochloroacetic acid & identify the sources of pollution.	<b>07</b>
<b>Q.4</b>	(a) Explain the step-by-step formation of crystals in crystallization operation.	<b>03</b>
	(b) Write down the full form of MSDS & purpose of it.	<b>04</b>
	(c) Write down the manufacturing process of Phenol along with chemical equations	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) Explain the environmental application of LLE & stripping operation.	<b>03</b>
	(b) List down the selection criteria for solvent in extraction operation.	<b>04</b>
	(c) Write a short note on methanol manufacturing process.	<b>07</b>
<b>Q.5</b>	(a) Discuss the factors affecting evaporation operation.	<b>03</b>
	(b) Differentiate between physical & chemical adsorption.	<b>04</b>
	(c) Write down the manufacturing process of Vinyl Acetate.	<b>07</b>
<b>OR</b>		
<b>Q.5</b>	(a) Define the hydrolysis process.	<b>03</b>
	(b) Define & differentiate between unit operations & unit processes.	<b>04</b>
	(c) Write down the manufacturing process of Vinyl Chloride along with chemical equations.	<b>07</b>

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