

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER– III EXAMINATION – SUMMER 2026

Subject Code:3131306

Date:19-06-2026

Subject Name:Unit Operations & Processes in Chemical Industries

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.

- Q.1** (a) How can an environmental engineer use the knowledge of this subject in the environmental engineering field? **03**
- (b) Enlist and explain the factors affecting adsorption and desorption. **04**
- (c) Prepare a list of different types of distillation and explain any one type in brief. Also prepare a list of manufacturing processes in which distillation is used. **07**
- Q.2** (a) Explain the liquid liquid extraction unit operation with an example. **03**
- (b) Explain the step-by-step formation of crystals in crystallization operation. **04**
- (c) Draw only a neat flow diagram of Ethanol production from Ethylene and explain the process. **07**
- OR**
- (c) Write down the manufacturing process of furfural and also mention the sources of pollution and hazards of furfural. **07**
- Q.3** (a) Enlist the types of absorbers used in the chemical industry & draw a neat sketch of anyone. **03**
- (b) Explain any TWO Unit Processes used for manufacturing of Ethylene Chlorohydrin in detail. **04**
- (c) Discuss the sources of pollution and safety measures for Ethylene Chlorohydrin. **07**
- OR**
- Q.3** (a) Discuss the health & safety aspects during acetic acid manufacturing. **03**
- (b) List the chemical and physical properties of Acetic acid. **04**
- (c) Draw the manufacturing process of aniline and mention the sources of pollution. **07**
- Q.4** (a) Explain the Hydrolysis process in with chemical reaction. **03**
- (b) Write down the full form of MSDS & list the contents of it. **04**
- (c) Write down the manufacturing process of Vinyl chloride with chemical reactions. **07**
- OR**
- Q.4** (a) Explain the oxidation process with chemical reaction. **03**
- (b) Define the term Ammonolysis. Draw a block diagram of process flow for Hydrogen Cyanide **04**
- (c) Write down the manufacturing process of monochloroacetic acid along with chemical equations. **07**
- Q.5** (a) Identify the unit operation and process in cottonseed oil manufacturing process and explain any one unit operation and process. **03**
- (b) Draw the manufacturing process flow diagram of Phenol and write the chemical equations. **04**
- (c) Write down the manufacturing process of Ethyl Acetate and draw flow diagram. **07**

OR

- Q.5**
- (a)** Identify the unit operation and process in the methanol manufacturing process and explain any one unit operation and process . **03**
 - (b)** Explain any TWO Unit Processes used for manufacturing of urea in detail. **04**
 - (c)** Draw a manufacturing flow diagram of urea production & identify the sources of pollution **07**
