

Enrollment No./Seat No.:

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Bachelor of Engineering - SEMESTER - III EXAMINATION - WINTER 2025**

**Subject Code: BE03005021**

**Date: 17-12-2025**

**Subject Name: Chemical Process Technology**

**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.**

	<b>Marks</b>
<b>Q.1 (a)</b> Distinguish between the unit operation and unit process with examples.	<b>03</b>
<b>(b)</b> Write the environmental issues in chemical manufacturing process.	<b>04</b>
<b>(c)</b> Describe the contact process for manufacture of sulfuric acid with flow sheet diagram.	<b>07</b>
<b>Q.2 (a)</b> Give the classification of dyes.	<b>03</b>
<b>(b)</b> Enlist the major engineering problems of sulfur production by oxidation reduction of H <sub>2</sub> S.	<b>04</b>
<b>(c)</b> Explain the preparation of nitric acid by ammonia oxidation process with all chemical reactions involve in it.	<b>07</b>
<b>OR</b>	
<b>(c)</b> Provide flow diagram and reactions required in the manufacturing of urea from ammonia and CO <sub>2</sub> .	<b>07</b>
<b>Q.3 (a)</b> What is NPK fertilizer? Why NPK fertilizers are used?	<b>03</b>
<b>(b)</b> List out the advantages and disadvantages of mercury process and diaphragm process.	<b>04</b>
<b>(c)</b> Explain the preparation of sodium bicarbonate using Solvay process with flow diagram.	<b>07</b>
<b>OR</b>	
<b>(a)</b> Define PVC of paints. What is its significance?	<b>03</b>
<b>(b)</b> Define pigment. Give the list of different types of pigments.	<b>04</b>
<b>(c)</b> Explain manufacturing process of H- acid with the help of diagram.	<b>07</b>
<b>Q.4 (a)</b> What are drugs? Write the types of drugs.	<b>03</b>
<b>(b)</b> Explain the manufacturing process of Vitamin-C (Ascorbic acid).	<b>04</b>
<b>(c)</b> Explain the soap manufacturing process in detail.	<b>07</b>

**OR**

- (a) Define antibiotics and give two examples. 03
- (b) List out the major vitamins and their sources. 04
- (c) Describe the complete manufacturing process of penicillin with a labelled flow diagram. 07
- Q.5** (a) Define citric acid and give one industrial application. 03
- (b) Enlist the major engineering problems of sugar production by sugar cane. 04
- (c) Explain the complete manufacturing process of cane sugar with a labelled flow chart. 07
- OR**
- (a) Give the various chemical reaction for setting and hardening of cement. 03
- (b) Explain the basic chemistry of ceramic materials. 04
- (c) Describe the pulp manufacturing by Kraft process. Also list out the major engineering problems. 07

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