

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-IV (NEW) EXAMINATION – SUMMER 2024****Subject Code:3140508****Date:01-07-2024****Subject Name: Unit Processes & Chemical 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.

|            |  | Marks     |
|------------|--|-----------|
| <b>Q.1</b> | (a) Enlist the oxidizing and reducing reagent.   | <b>03</b> |
|            | (b) Discuss the oxidation reaction of xylene.  | <b>04</b> |
|            | (c) Explain DCDA process with neat flow sheet for the production of sulphuric acid.  | <b>07</b> |
| <b>Q.2</b> | (a) Discuss in brief: NPK fertilizer.  | <b>03</b> |
|            | (b) Explain the major engineering problem in the manufacturing of $H_3PO_4$ by wet process.                                  | <b>04</b> |
|            | (c) Enlist Sulphonating reagent. Explain the sulphonation process of Benzene with flow diagram.                              | <b>07</b> |
|            | <b>OR</b>  |           |
|            | (c) Starting with neat flow diagram and chemical reactions, discuss the manufacturing of Nitric acid.                        | <b>07</b> |
| <b>Q.3</b> | (a) Give the classification of dyes according to its application.  | <b>03</b> |
|            | (b) Synthesis of Vat Dyes.   | <b>04</b> |
|            | (c) Explain the manufacturing process of Koch-Acid with a process flow diagram.  | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.3</b> | (a) What is the role of a membrane in the production on caustic soda?  | <b>03</b> |
|            | (b) Enlist advantages and disadvantages of Solvay Process.   | <b>04</b> |
|            | (c) Define Varnish, Thinner. Discuss the types of Pigments with suitable example.  | <b>07</b> |
| <b>Q.4</b> | (a) Write a note on ceramics.  | <b>03</b> |
|            | (b) Discuss the difference between sulphate and sulphite process for pulping.  | <b>04</b> |
|            | (c) What is pulp? Explain manufacturing of Paper making process. Why fillers and sizing agent are added in paper production? | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.4</b> | (a) Synthesis of Barbitol.   | <b>03</b> |
|            | (b) Synthesis of Congo Red azo dye and its application   | <b>04</b> |
|            | (c) Explain manufacturing process of Portland cement with neat flow diagram.   | <b>07</b> |
| <b>Q.5</b> | (a) Write the important properties of petroleum products.  | <b>03</b> |
|            | (b) Write a note on cracking of petroleum.   | <b>04</b> |
|            | (c) What is fermentation? Explain manufacturing of industrial alcohol with neat flow diagram.                                | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.5</b> | (a) Write a note on Ascorbic acid.   | <b>03</b> |
|            | (b) Give the classification of various drugs and pharmaceuticals.  | <b>04</b> |
|            | (c) Describe the application, synthesis of penicillin and Aspirin.   | <b>07</b> |

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