

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE(Minor) - SEMESTER- V EXAMINATION – WINTER 2023****Subject Code:115AB01****Date:07-02-2024****Subject Name: Advanced Industrial Waste Treatment 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</b> | (a) Explain any two physical characteristics of water in details.                                                                 | <b>03</b>    |
|            | (b) Differentiate between sources and types of industrial waste water with examples.                                              | <b>04</b>    |
|            | (c) How does industrial wastewater affect the environment?                                                                        | <b>07</b>    |
| <b>Q.2</b> | (a) Explain Coagulation in waste water treatment with examples.                                                                   | <b>03</b>    |
|            | (b) What are the advantages and disadvantages of chemical precipitation?                                                          | <b>04</b>    |
|            | (c) What is the role of chemical oxidation in industrial wastewater treatment? also write application and advantages.             | <b>07</b>    |
|            | <b>OR</b>                                                                                                                         |              |
|            | (c) Name major method of neutralizing both acid and alkali waste? Explain any two in both waste.                                  | <b>07</b>    |
| <b>Q.3</b> | (a) What is industrial waste water? How is different from domestic sewage?                                                        | <b>03</b>    |
|            | (b) What are limitation and drawback Common Effluent Treatment Plants (CETP).                                                     | <b>04</b>    |
|            | (c) Explain Common Effluent Treatment Plants (CETP) with suitable schematic diagram.                                              | <b>07</b>    |
|            | <b>OR</b>                                                                                                                         |              |
| <b>Q.3</b> | (a) Application of Zero effluent discharge systems.                                                                               | <b>03</b>    |
|            | (b) Importance of Zero effluent discharge systems.                                                                                | <b>04</b>    |
|            | (c) Explain Zero effluent discharge systems with suitable schematic diagram.                                                      | <b>07</b>    |
| <b>Q.4</b> | (a) What is the role of the unit process in wastewater treatment?                                                                 | <b>03</b>    |
|            | (b) Discuss the management of RO rejects.                                                                                         | <b>04</b>    |
|            | (c) Explain source of pharmaceuticals waste and the recommended process for their treatment with suitable schematic diagram.      | <b>07</b>    |
|            | <b>OR</b>                                                                                                                         |              |
| <b>Q.4</b> | (a) What are the chemical unit operations in waste water treatment?                                                               | <b>03</b>    |
|            | (b) What are the methods of sewage disposal on land and water?                                                                    | <b>04</b>    |
|            | (c) Explain source of thermal power plants waste and the recommended process for their treatment with suitable schematic diagram. | <b>07</b>    |
| <b>Q.5</b> | (a) What are the methods of wastewater reduction?                                                                                 | <b>03</b>    |
|            | (b) What are the necessities and importance of industrial waste water reuse.                                                      | <b>04</b>    |
|            | (c) Explain source of petroleum refining waste and the recommended process for their treatment with suitable schematic diagram.   | <b>07</b>    |
|            | <b>OR</b>                                                                                                                         |              |
| <b>Q.5</b> | (a) Explain any two chemical characteristics of water in details..                                                                | <b>03</b>    |
|            | (b) Write major residuals from waste water treatment plant and also draw management plan for residuals.                           | <b>04</b>    |
|            | (c) Explain source of textiles waste and the recommended process for their treatment with suitable schematic diagram.             | <b>07</b>    |

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