Enrolment No./Seat No_____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE- SEMESTER–VI EXAMINATION – WINTER 2025**

**Subject Code: 3160513 Date: 19-11-2025**

**Subject Name: Waste Water Engineering**

**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.**

| | | | MARK |
|---|---|---|---|
| **Q.1** | **(a)** | How does the root zone technology work to treat the wastewater? | **03** |
| | **(b)** | Outline steps which involved in trickling filters. | **04** |
| | **(c)** | Develop and discuss wastewater treatment plants for reactive dyes industry wastewater. | **07** |
| **Q.2** | **(a)** | Explain how the treatment cost has a direct relation with the quantification of wastewater flows. | **03** |
| | **(b)** | Discuss wastewater characteristics. | **04** |
| | **(c)** | Explain in detail rotating biological contractor. | **07** |
| | | **OR** | |
| | **(c)** | Explain in detail sequential batch reactor. | **07** |
| **Q.3** | **(a)** | Why do we need to follow sampling protocols while sampling? | **03** |
| | **(b)** | Interpret: how advanced treatment methods can contribute to improving wastewater treatment costs? | **04** |
| | **(c)** | Differentiate fluidized bed and expanded bed reactor with UASB. | **07** |
| **Q.3** | **(a)** | Describe the need of proportioning process. | **03** |
| | **(b)** | Explain why the groundwater recharge system is needed for the survival of human activities. | **04** |
| | **(c)** | Demonstrate concept of anaerobic contact process with fixed film reactor. | **07** |
| **Q.4** | **(a)** | List recent technologies used for treatment. | **03** |
| | **(b)** | Explain reuse and reclamation of wastewater. | **04** |
| | **(c)** | Develop and discuss wastewater treatment plants for the paper and pulp industry. | **07** |
| **Q.4** | **(a)** | Why disposal standardization is required to regulate the disposal of treated wastewater? | **03** |
| | **(b)** | Explain duckweed pond. | **04** |
| | **(c)** | Develop and discuss wastewater treatment plants for the textile industry. | **07** |
| **Q.5** | **(a)** | Why pH adjustment is necessary for the anaerobic process? | **03** |
| | **(b)** | Differentiate between preliminary and primary treatment process. | **04** |
| | **(c)** | Discuss activated sludge with its mass balance. | **07** |
| **Q.5** | **(a)** | How temperature can affect the anaerobic process efficiency? | **03** |
| | **(b)** | Explain wastewater collection system. | **04** |
| | **(c)** | Describe physic-chemical and biological treatment strategies. | **07** |