

Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 3 – EXAMINATION – SUMMER 2026

Subject Code: 3131302

Date: 03/07/2026

Subject Name: Environmental Microbiology & Bioremediation

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) Define viruses and mention two characteristics that distinguish them from bacteria. **03**
(b) Explain the four stages of bacterial growth. **04**
(c) Enlist and explain physical agents for control of Microbes. **07**
- Q.2** (a) Mention three differences between plant and animal cells. **03**
(b) Differentiate between Bioremediation and Biodegradation. **04**
(c) Explain the essential factor for microbial bioremediation. **07**
- OR
- Q.2** (c) Explain the major characteristics of microorganisms. **07**
- Q.3** (a) Enlist the stages of the viral life cycle. **03**
(b) Differentiate between Sterilization and Disinfection. **04**
(c) Write a short note on Lactic Acid Production. **07**
- OR
- Q.3** (a) State any three structural differences between prokaryotic and eukaryotic cells. **03**
(b) State the different characteristics of an ideal disinfectant. **04**
(c) Enlist the diseases caused by Viruses and enlist the symptoms, treatment and prevention of any one disease in detail **07**
- Q.4** (a) Define protozoa and mention two important ecological roles. **03**
(b) Compare Gram-positive and Gram-negative bacteria. **04**
(c) Discuss the classification of fungi and explain one class in detail, including its significance to humans or the environment. **07**
- OR
- Q.4** (a) Explain the role of microbes in bioremediation. **03**
(b) Differentiate between Natural bioremediation and Engineered bioremediation **04**
(c) Explain the Principle of Bioremediation and advantage and disadvantages. **07**
- Q.5** (a) State three types of bacteria in terms of shape and arrangement. **03**
(b) Write a brief note on In-situ bioremediation of Soil. **04**
(c) Write the short note on phytoremediation. **07**
- OR
- Q.5** (a) Enlist the various cultural methods. **03**
(b) Compare different types of microscopies. **04**
(c) Explain working principle of Fluorescence Microscopy **07**
