

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-III EXAMINATION – WINTER 2025

Subject Code:3131302

Date:31-12-2025

Subject Name: Environmental Microbiology & Bioremediation

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.

- Q.1** (a) Define the following terms: **03**
(i) Magnification (ii) Reflective Index (iii) Resolution
- (b) Explain the role of microbes in human life and in environment. **04**
- (c) Write a short note on “History of Microbiology”. **07**
- Q.2** (a) State the classification of Microscopes. **03**
- (b) Differentiate between Light Microscope & Electron Microscope. **04**
- (c) Explain the different parts of Bacterial Cell, Plant Cell & Animal Cell with neat diagram. **07**
- OR**
- (c) Write a short note on Lactic acid production using microbes. **07**
- Q.3** (a) Differentiate between aerobic and anaerobic respiration. **03**
- (b) Enlist and explain any two physical agents for control of Microbes. **04**
- (c) Explain the various cultural methods. **07**
- OR**
- Q.3** (a) Conceptualize the role of microbes in Sewage. **03**
- (b) Enlist and explain any two chemical agents for control of Microbes. **04**
- (c) What is pure culture? Explain different techniques used for isolation of pure culture. **07**
- Q.4** (a) Highlight the importance of MPN test in drinking water. **03**
- (b) Differentiate between Disinfection & Antiseptic. **04**
- (c) Enlist the diseases caused by Protozoa and explain the symptoms, treatment and prevention for any one disease. **07**
- OR**
- Q.4** (a) Differentiate between Pasteurization & Sterilization. **03**
- (b) Explain the different stages of bacterial growth curve and explain about each stage. **04**
- (c) Give the classification of viruses with respect to their shape and types. Also enlist the typical diseases caused by virus. **07**
- Q.5** (a) Discuss the factors that are essential for microbial bioremediation. **03**
- (b) Give the difference between Natural bioremediation and Engineered bioremediation. **04**
- (c) Enlist and Explain various In-situ bioremediation technique. **07**
- OR**
- Q.5** (a) Write down advantages and disadvantages of Ex-situ bioremediation. **03**
- (b) Give the difference between Bioremediation and Biodegradation **04**
- (c) Write the short note on phytoremediation. **07**
