

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III (NEW) EXAMINATION – WINTER 2023

Subject Code:3131302

Date:12-01-2024

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) Explain the importance of protozoa in environment. **03**
(b) Describe the scope of microbiology in the field of Environmental Engineering. **04**
(c) Explain the role of microbes in human life and in environment. **07**
- Q.2** (a) Define (any three): (i) magnification (ii) numerical aperture **03**
(iii) pasteurization (iv) sanitization
(b) Differentiate between: prokaryotic cell and eukaryotic cell. **04**
(c) Explain the different parts of bacterial cell with neat diagram and also give the classification of bacteria. **07**
- OR**
- (c) Explain the major characteristics of microorganisms. **07**
- Q.3** (a) Explain the different stages of the bacterial growth curve with a figure. **03**
(b) List out the various staining techniques and explain gram staining in detail. **04**
(c) Describe the various cultural methods. **07**
- OR**
- Q.3** (a) Write a short note on Whittaker five kingdom classification. **03**
(b) Differentiate between: (i) Pour plate method and spread plate method **04**
(ii) Dye and stain
(c) What is pure culture? Explain a list of diff. techniques used for maintenance and preservation of pure culture. **07**
- Q.4** (a) Enlist chemical agents for control of microbes. **03**
(b) Explain the working of electron microscope with neat sketch. **04**
(c) Write a short note on phytoremediation. **07**
- OR**
- Q.4** (a) Enlist physical agents for control of microbes. **03**
(b) Differentiate between light microscope and electron microscope. **04**
(c) Differentiate between (i) in-situ bioremediation & ex-situ bioremediation **07**
(ii) biodegradation and bioremediation
- Q.5** (a) Differentiate between pasteurization & lyophilization. **03**
(b) Write a short note on fermentation process. **04**
(c) Explain the complete procedure to perform MPN test for water. **07**
- OR**
- Q.5** (a) Differentiate between disinfection & sterilization. **03**
(b) Enlist the diseases caused by protozoa and explain the symptoms, treatment, and prevention of any one disease. **04**
(c) Explain the SPC test of milk using serial dilution techniques. **07**
