

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– III (New) EXAMINATION – WINTER 2019****Subject Code: 3131302****Date: 26/11/2019****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.

- Q.1** (a) Give the classification of bacteria. **03**  
(b) Write a short note on Whittaker five kingdom classification. **04**  
(c) Explain the role of microbes in human life and in environment. **07**

- Q.2** (a) Differentiate between Animal Cell & Plant Cell. **03**  
(b) Give different stages of bacterial growth Curve and explain about each stage. **04**  
(c) Explain the complete procedure to perform MPN test for water. **07**

**OR**

- (c) Briefly explain the SPC test of milk using serial dilution techniques. **07**

- Q.3** (a) Give the classification of Microscopes. **03**  
(b) Explain the working of electron microscope with neat sketch. **04**  
(c) Enlist the diseases caused by protozoa and explain the symptoms, treatment and prevention of any one in detail. **07**

**OR**

- Q.3** (a) Describe the working principle of Transmission Electron Microscopy. **03**  
(b) Differentiate between Light Microscope & Electron Microscope. **04**  
(c) Explain the procedure for production of Lactic Acid. **07**

- Q.4** (a) Differentiate between Disinfection & Sterilization. **03**  
(b) Compare Gram Positive bacteria with Gram Negative bacteria. **04**  
(c) Enlist and explain physical agents for control of Microbes. **07**

**OR**

- Q.4** (a) Differentiate between Pasteurization & Lyophilization. **03**  
(b) List out the different staining techniques and explain gram staining in detail. **04**  
(c) Write a short not on Chemical agents for the control of microbes. **07**

- Q.5** (a) List out the various cultural methods. **03**  
(b) Differentiate between biodegradation and bioremediation. **04**  
(c) Discuss the advantages and disadvantages of In-situ Bioremediation. **07**

**OR**

- Q.5** (a) Describe a list of different techniques used for preservation of pure culture. **03**  
(b) Differentiate between In-situ Bioremediation and Ex-situ Bioremediation **04**  
(c) Write a short note on Phytoremediation. **07**