

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - III EXAMINATION - WINTER 2025

Subject Code: BE03004041

Date: 19-12-2025

Subject Name: Microbiology

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.**

	Marks
Q.1 (a) Define microorganisms and list any two major groups of microbes.	03
(b) Explain the theory of spontaneous generation and the experiments that disproved it.	04
(c) Explain the germ theory of disease and describe Koch's postulates with suitable examples.	07
Q.2 (a) Explain the principle and applications of light microscopy.	03
(b) Describe the structure and functions of bacterial flagella with diagram.	04
(c) Describe the microbial growth curve with diagram and factors affecting microbial growth.	07
OR	
(c) Explain methods for control of microbial growth using physical and chemical agents.	07
Q.3 (a) Differentiate between disinfectants and antiseptics with examples.	03
(b) Explain horizontal gene transfer mechanisms in bacteria with diagram.	04
(c) Describe the production of industrial enzymes using microorganisms. Add suitable examples.	07
OR	
(a) Describe selective and differential media with examples.	03
(b) Describe the classification of algae and their commercial applications.	04
(c) Explain the general characteristics of fungi and differentiate between yeasts and molds based on morphology and reproduction. Discuss their economic importance.	07
Q.4 (a) Describe different methods used for the isolation of bacteria from environment sources.	03
(b) Describe the production of antibiotics using microorganisms.	04
(c) Since viruses cannot be cultivated in the same way as bacteria, explain different ways of viruses cultivation in laboratory settings.	07

OR

- (a) Describe the role of microbes in industrial applications. 03
 - (b) Explain the Baltimore classification of viruses with examples. 04
 - (c) Explain antibiotic resistance in detail, including mechanisms, causes, and global impact. 07
- Q.5**
- (a) Describe the role of microorganisms in nitrogen cycle. 03
 - (b) Describe protozoa with reference to morphology and pathogenicity. 04
 - (c) Explain the ultra-structure of a bacterial cell and the functions of its key components with diagram. 07

OR

- (a) Explain viroids and their significance in plant pathology. 03
- (b) Write notes on the steps for isolating pure cultures from mixed microbial populations. 04
- (c) Discuss the evidence proving DNA as the hereditary material. 07
