

A Charutar Vidya Mandal's Institution
V.P. & R.P.T.P. SCIENCE COLLEGE

(AUTONOMOUS) (Grant-in-Aid)
Affiliated to Sardar Patel University
VALLABH VIDYANAGAR-388120

Bachelor of Science (Semester IV) External Examination - 2026

Subject Code: US04MAMIC02

Subject Name: Environmental Microbiology

Date: 25/03/2026 (Wednesday)

Time: 01:45 PM to 04:15 PM

Total: 50 Marks

NOTE: Figure to the right indicate full marks of the questions.

For MCQs: Answer both code & word in sequence is mandatory.

Q.1 Multiple Choice Questions:

[10]

1. Which method of enumeration of airborne microorganisms involves trapping particles in a liquid medium for subsequent analysis?
 - a. Filtration
 - b. Impingement in liquids
 - c. Sedimentation
 - d. Electrostatic precipitation
2. The settle plate technique used in aeromicrobiology is primarily based on which principle?
 - a. Filtration of air
 - b. Electrostatic attraction
 - c. Gravitational sedimentation of particles
 - d. Centrifugal force
3. Extracellular polymeric substances (EPS) in biofilms help in:
 - a. Photosynthesis
 - b. Sporulation
 - c. Mutation
 - d. Attachment and protection
4. Rhizosphere is:
 - a. Leaf surface
 - b. Flower region
 - c. Stem region
 - d. Root surface region influenced by roots
5. In soil microbial interactions, the relationship where one organism benefits while the other remains unaffected is called:
 - a. Mutualism
 - b. Commensalism
 - c. Parasitism
 - d. Amensalism
6. The conversion of ammonia into nitrite in the nitrogen cycle is carried out by:
 - a. Nitrobacter
 - b. Nitrosomonas
 - c. Azotobacter
 - d. Clostridium
7. The Most Probable Number (MPN) test is primarily used to estimate:
 - a. Total bacterial biomass
 - b. Viral contamination
 - c. Coliform bacteria in water
 - d. Fungal spores
8. The trickling filter process used in sewage treatment belongs to which stage of treatment?
 - a. Primary treatment
 - b. Secondary biological treatment
 - c. Tertiary treatment
 - d. Preliminary treatment
9. Bioleaching of copper is commonly carried out by which microorganism?
 - a. *Thiobacillus ferrooxidans*
 - b. *Bacillus subtilis*
 - c. *Saccharomyces cerevisiae*
 - d. *Pseudomonas fluorescens*
10. Which group of extremophiles grows optimally at pH values below 3?
 - a. Alkaliphile
 - b. Halophiles
 - c. Acidophiles
 - d. Psychrophiles



Q.2 Describe any three methods of enumeration of microorganisms in air. [10]

OR

Q.2 Write a note on extremophilic microorganisms. [10]

Q.3 Discuss the interactions among soil microorganisms with suitable examples. [10]

OR

Q.3 Explain the nitrogen cycle in detail and describe the role of microorganisms involved in each step. [10]

Q.4 Describe the bacteriological examination of drinking water. [10]

OR

Q.4 Write a note on Trickling filter & activated sludge process. [10]

Q.5 Explain the microbial biodegradation of alkyl benzyl sulfonates and oil pollutants. [10]

OR

Q.5 Write a note on MEOR [10]

