

B.Sc. Semester - 4 (CBCS) Examination**March/April-2026 [NEW COURSE]****Microbiology-Mi401(Core)****Time: 2:30 Hours****Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que.1(A) Give specific answers. (04)
1. The zone of soil directly influenced by plant roots and associated microbial activity is called the _____.
 2. In the nitrogen cycle, the conversion of atmospheric nitrogen into ammonia by microorganisms is known as _____.
 3. Fungi and bacteria are the primary microbial groups found in the rhizosphere. (True/False)
 4. Winogradsky's column is used to study aerobic soil microorganisms. (True/False)
- Que.1(B) Answer in Brief. (Any 1 out of 2) (03)
1. Differentiate between sedimentary and gaseous biogeochemical cycles.
 2. What are the key chemical characteristics of soil that influence microbial growth?
- Que.1(C) Write a Note on. (Any 1 out of 2) (07)
1. Explain nitrogen fixation and the role of microorganisms in this process.
 2. Short note on Biofertilizers.
- Que.2(A) Give specific answers. (04)
1. Staphylococcus aureus causes food poisoning by producing _____.
 2. The microbial examination of food ensures its safety and quality. In India, the certification for food quality is provided by _____.
 3. Clostridium botulinum produces a heat-stable toxin responsible for food poisoning. (True/False)
 4. Single Cell Protein refers to microbial biomass that can be used as a food source. (True/False)
- Que.2(B) Answer in Brief. (Any 1 out of 2) (03)
1. Differentiate between foodborne infection and foodborne intoxication.
 2. Mention two methods used for preserving fresh foods and explain their principle
- Que.2(C) Write a Note on. (Any 1 out of 2) (07)
1. Explain the role of S. aureus, C. botulinum, and Salmonella spp. in foodborne diseases.
 2. Describe the process of fermentation in food production with examples of sauerkraut, and bread.
- Que.3(A) Give specific answers. (04)
1. The predominant lactic acid bacteria used in yogurt production belong to the genus _____.
 2. The Methylene Blue Reduction Test is used to assess the _____ quality of milk.
 3. Psychrotrophic bacteria in milk can grow at refrigeration temperatures. (True/False)
 4. Cheese production requires only lactic acid bacteria, and no other microorganisms. (True/False)
- Que.3(B) Answer in Brief. (Any 1 out of 2) (03)
1. Differentiate between SPC and Direct Microscopic Count in microbial analysis of milk.
 2. Name two methods of milk preservation and briefly explain their principles.

- Que.3(C) Write a Note on. (Any 1 out of 2) (07)
1. Explain the different types of microorganisms found in milk based on their biochemical, pathogenic, and temperature classifications.
 2. Describe the process of cheese and yogurt production, including the role of starter cultures.
- Que.4(A) Give specific answers. (04)
1. The presence of _____ in drinking water indicates fecal contamination and potential health risks.
 2. The two key biochemical parameters used to assess wastewater quality are _____ and _____.
 3. Sand filtration is an advanced treatment method used in wastewater treatment. (True/False)
 4. Anaerobic sludge digestion is a process used for solid waste decomposition. (True/False)
- Que.4(B) Answer in Brief. (Any 1 out of 2) (03)
1. Differentiate between BOD and COD.
 2. What is the role of disinfection in drinking water purification?
- Que.4(C) Write a Note on. (Any 1 out of 2) (07)
1. Explain the primary, secondary, and advanced treatment processes in municipal wastewater treatment.
 2. Describe the bacteriological analysis and sampling techniques used to detect water pollution.
- Que.5(A) Give specific answers. (04)
1. _____ testing is performed to ensure that pharmaceutical products are free from viable microorganisms.
 2. _____ and _____ are key regulatory guidelines followed in pharmaceutical industries for quality assurance and validation.
 3. GMP (Good Manufacturing Practices) ensures the consistent production of pharmaceutical products with required quality standards. (True/False)
 4. ISO certifications are specific to pharmaceutical industries only. (True/False)
- Que.5(B) Answer in Brief. (Any 1 out of 2) (03)
1. Differentiate between GMP and GLP.
 2. What is the role of pharmacopoeia in pharmaceutical microbiology?
- Que.5(C) Write a Note on. (Any 1 out of 2) (07)
1. Explain the importance of sterility testing and its methods in pharmaceutical products.
 2. Discuss Total Quality Management and its significance in pharmaceutical industries.
