

**B.Sc. Semester - 4 (NEP-2020) Examination****March/April-2026****MIC: Bioprocess Technology (Major-9)****Time: 2:00 Hours****Marks:50****Instructions:**

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

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- Que.1 (1) Describe the methods used for isolation of industrially important microorganisms. (05)  
(2) Explain the key components and its role in fermentation process. (05)
- OR
- (1) Explain protoplast fusion method and its application for strain improvement. (05)  
(2) Write a note on primary screening techniques used for microbial strains selection. (05)
- Que.2 (1) Explain the process of inoculum development and its importance in fermentation technology. (05)  
(2) Write a note on statistical approaches used in media optimization Plackett–Burman design. (05)
- OR
- (1) Describe the role of carbon, nitrogen and mineral sources in fermentation process. (05)  
(2) Explain in detail media optimization techniques for improve yield and productivity in fermentation processes. (05)
- Que.3 (1) Explain the criteria for the design of fermenter for large-scale microbial production. (05)  
(2) Explain the role of aeration and agitation in a fermentation process. (05)
- OR
- (1) Write a difference between continuous and batch fermentation process. (05)  
(2) Write a note on role of aeration and agitation in fermentation process. (05)
- Que.4 (1) Describe the industrial production of ethyl alcohol using microbial fermentation. (05)  
(2) Describe the industrial production of riboflavin (vitamin B<sub>2</sub>) by microbial fermentation. (05)
- OR
- (1) Describe the industrial production of lysine by microbial fermentation. (05)  
(2) Define immobilization and different methods used for cell immobilization in industrial fermentation. (05)
- Que.5 (1) Write a note on selection criteria for desired microbial characters for isolation and strain improvement in fermentation process. (05)  
(2) Explain the role of growth regulators, antifoam agents and buffers in maintaining optimal fermentation conditions. (05)
- OR
- (1) Explain the concept of the Del (D) factor and its importance in sterilization processes. (05)  
(2) Explain the industrial production of amylases, including microorganism used and applications. (05)

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