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Total No. of Pages : 02

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M.Tech.(Bio. Tech.) (Sem.–1)

# MICROBIAL BIOTECHNOLOGY

Subject Code : MTBT-101

Paper ID : [E0870]

Time : 3 Hrs. Max. Marks : 100

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWENTY marks.

1. a) Illustrate the role and importance of microbes in agriculture. (8)

   b) Explain why microbes are important with regard to human therapeutics. (7)

   c) Microbial feedstocks are useful in bioprocessing. Elaborate with examples. (5)

2. a) Explain why *E. coli* is used as a preferred host in many industrial applications. (7)

   b) Depict the morphological aspects and growth parameters of *S. cerevisiae*. (6)

   c) Analyze the commercial importance of yeast and *Penicillium* strains. (7)

3. a) What do you understand by primary and secondary screening of microorganisms? (5)

   b) State the characteristic features of any four thermophilic Archaea. (8)

   c) Give an account of any two case studies on bioprospecting. (7)

4. a) How do you isolate desirable bacterial mutants by random mutagenesis? (7)

   b) Elaborate the molecular techniques involved in genetic manipulation of yeast. (8)

   c) How do you ensure long-term preservation of bacterial strains? (5)

5. a) What are the general considerations for large-scale enzyme production? (5)

   b) Outline the strategy adopted in the production of recombinant vaccines. (6)

   c) State the mode of action of penicillin. How do you produce it? (9)



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6. a) What are the major applications of citric acid and gluconic acid? (7)

   b) Give an account of the microbial strains for citric acid production. (5)

   c) Describe fermentative production, recovery and applications of Vitamin $B_{12}$. (8)

7. a) State the biosynthesis of ethanol and give a schematic view of its production. (7)

   b) Write a comprehensive note on biofertilizers with examples. (7)

   c) Outline the biosynthetic pathway for polyhydroxybutyric acid. (6)

8. a) Outline the steps involved for production of bio-insecticide using *Bacillus sp*. (7)

   b) Assess the importance of probiotic foods citing any four examples. (8)

   c) Explain why microbes are promising for the degradation of pollutants. (5)

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