

# Question Paper

Exam Date & Time: 28-Dec-2023 (10:00 AM - 01:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal Academy of Higher Education, Manipal MPharm Theory End-Semester Examinations.

**Bioprocess Engineering and Technology [PBT-MPB103T - S3]**

**Marks: 75**

**Duration: 180 mins.**

### SECTION - A

**Answer all the questions.**

Answer the following (10 marks x 5 = 50 marks)

- 1) With the help of a neat labelled diagram of a typical rheogram, explain the rheological changes during a Streptomyces fermentation. (10)
- 2) Enlist and explain the different methods for immobilization of industrial enzymes. Add a note on advantages and limitations of each method. (10)
- 3) What is an auxotrophic fermentation? Explain the production of Lysine. (10)
- 4) With necessary illustrations, explain the operation and applications of airlift, packed bed, hollow fibre and fluidized bed bioreactors. Compare their specific advantages and applications with CSTR (10)
- 5) Give a detailed account on the microbial product formation kinetics. (10)

### SECTION - B

**Answer all the questions.**

Answer the following (5 marks x 5 = 25 marks)

- 6) Write a note on air quality standards and plenum ventilation. (5)
- 7) Explain microbial production of nanoparticles. (5)
- 8) Explain the production of monoclonal antibodies using hybridoma technology. (5)
- 9) Describe the primary screening of amylase producing bacteria from soil. (5)
- 10) Explain the usage of precipitation technique in the downstream processing for purification of a protein. (5)

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