Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
End Semester Examination MAR/APR 2025
Faculty: Science and Technology

Program: BScGen03 **Semester: VI** **SET: A**
Program (Specific): BSc. Microbiology **Course Type: DSC**
Class: T.Y. B.Sc. **Max.Marks: 35**
Name of the Course: Bioprocess Technology
Course Code: 24-MB-365 **Time: 2Hr**
Paper-V

Instructions to the candidate:

1) ***There are 4 sections in the question paper. Write each section on separate page.***
2) ***All Sections are compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Draw a well labelled diagram wherever necessary.***

SECTION: A

Q1) Multiple Choice Questions (MCQs) **5X1 = 5 Marks**

I. The microorganism predominantly employed for citric acid synthesis:
   a) *Saccharomyces cerevisiae* b) *Aspergillus niger*
   c) *Lactobacillus acidophilus* d) *Penicillium chrysogenum*

II. Wines undergoing malolactic fermentation include:
   a) Sparkling wine b) Red wine
   c) Fortified wine d) White wine

III. Secondary metabolites are best represented by:
   a) Glucose b) Penicillin
   c) Ethanol d) Lysine

IV. Probiotics include:
   a) *Escherichia coli* b) *Clostridium difficile*
   c) *Lactobacillus sporogenes* d) *Pseudomonas aeruginosa*

V. Microbial transformation of steroids yields:

a) Citric acid b) Progesterone

c) Lactic acid d) Penicillin

Q2) Answer any FOUR of the following 4X1 = 4 Marks

I. Outline the steps involved in bioethanol production.

II. Categorize beers based on fermentation types.

III. What is the role of aeration in large-scale fermentation processes?

IV. Compare the advantages of batch and continuous fermentation in industrial applications.

V. List two examples of microbial primary metabolites.

VI. Summarize the role of biosurfactants in industrial processes.

SECTION: B

Q3) Answer any FOUR of the following 4X2 = 8 Marks

I. Describe the steps involved in citric acid production through fermentation.

II. Explain the differences between bacterial and mold-ripened cheese.

III. Discuss the significance of aerobic conditions in large-scale fermentation.

IV. Explain how malolactic fermentation enhances the quality of wine.

V. Describe the production pathway of lysine and its applications.

VI. Elaborate on the types of microbial transformation of steroids.

SECTION: C

Q4) Answer any FOUR of the following 4X2 = 8 Marks

I. Explain the flowsheet of production process of antibiotics like streptomycin.

II. Discuss the role of bioemulsifiers in industry.

III. Describe the steps involved in vaccine production using the Vero cell line.

IV. Explain the production of vitamin B12.

V. Discuss the role of enzymes like amylase in industrial applications.

VI. Write short notes on the modern trends in microbial production.

SECTION: D

Q5) Attempt any TWO of the following **5X2 = 10 Marks**

I. Discuss the process, conditions, and applications of submerged fermentation for penicillin production.

II. Compare and contrast solid-state and submerged fermentation with examples and applications.

III. Explain the production pathway, fermentation process, and product recovery of bioethanol.

IV. Discuss the role and production process of probiotics such as *Lactobacillus sporogenes*.

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