

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- MAY-2023

COURSE CODE(CREDITS): 21MS1MB211 (03)

MAX. MARKS: 25

COURSE NAME: Enzymes & Bioprocess Technology

COURSE INSTRUCTORS: Dr. Saurabh Bansal

MAX. TIME: 1 Hour 30 Minutes

*Note: All questions are compulsory. Marks are indicated against each question in square brackets.*

1. a) Determine the doubling time if a bacterial culture grows with a specific rate of  $0.693 \text{ hr}^{-1}$ . [1]  
b) Which of the mode of fermentation show the maximum productivity? [1]  
c) Whether a batch culture is an example of dynamic system? Justify your answer. [2]
2. Why Airlift Bioreactor is better than bubble column bioreactor? [2]
3. Why is it essential to preserve the industrially important microorganisms? Explain one method of bacteria preservation. [2]
4. How can you shorten the lag phase of a bacterial culture during set up a fermentation? [2]
5. List the four major objectives of the strain improvement program. Give an example of strain improvement relevant to the alcohol manufacturing industries. [3]
6. Differentiate between: [6]
  - a) Fixed Bed and Fluidized Bed Bioreactor
  - b) Growth-Associated and Non-Growth Associated Products
  - c) Yield and Productivity
7. A culture has been selected for the production of desired molecule. But during study, it was observed that the same culture produces a toxic byproduct which adversely affect the growth and the productivity of the process. By using same culture, you wish to establish a fermentation setup. Which mode of fermentation will you select and why? [3]
8. Write down the function of following: [3]
  - a) Load Cell
  - b) Baffle
  - c) Sparger