

*NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

*x-x-x*

I. Attempt the following:-

- a) Write the name of an acid produced by fermentation method and its organism.(1)
- b) List the products obtained from *Bacillus*. (2)
- c) What is the role of sparger? (1)
- d) What is the role of baffles? (1)
- e) Write the name of organism for production of Lactic acid. (1)
- f) Write the name of organism for production of an antibiotic. (1)
- g) What do you understand by primary metabolites? Give examples. (2)
- h) Give examples of cryoprotectants. (1)

**UNIT - I**

- II. Describe the various components of an ideal growth medium for fermentation. Also discuss the crude media's with example. (8,2)
- III. Discuss the design and components of a fermentor. Also explain the role of each component. (10)
- IV. Describe various methods of strain improvement of organisms. (10)

**UNIT - II**

- V. Describe in detail the microbial fermentation process for production of Penicillin. (10)
- VI. Describe the microbial production of citric acid and its applications. (10)
- VII. Describe various methods of immobilization of enzymes. Describe its advantages and disadvantages. (10)

*x-x-x*