

Ref. No. : Ex/FTBE/PC/B/T/316/2025

**B.E. FOOD TECHNOLOGY AND BIO-CHEMICAL ENGINEERING THIRD YEAR
FIRST SEMESTER – 2025**

Subject : MICROBIAL TECHNOLOGY

Time: 3hr

Full Marks: 100

Part I (Total Marks 50)

Instructions : Use Separate Answer scripts for each part

Answer any **five** questions from the following:

5x10=50

1. What is the importance of microorganism in agriculture? Explain the role of microorganism in the maintenance of carbon cycle. 5+5=10 (CO1)

2. Why enzyme production from microbial source is advantageous over plant and animal source? What are the criteria to select microorganism for enzyme production? 6+4=10 (CO4)

3. Differentiate between batch, fed batch and continuous fermentation process. Explain any one non mechanical method of cell disruption. 6+4=10 (CO1)

4. What is the need of enzyme purification? Explain the working principle of size exclusion chromatography. What is enzyme immobilization? What are the advantages of it?

(1+4)+(1+4)=10 (CO4)

5. What are the criteria to select ideal matrix for enzyme immobilization? What are the advantages of surface/ bound immobilization method over membrane entrapment? 5+5=10 (CO4)

6. What are the major phases of mushroom cultivation? What do you mean by spawn? What are the major phases of spawn production? Mention any two constraints of mushroom cultivation.

5+1+2+2=10 (CO4)

7. Mention the factors that affect biomass production (SCP)? What are the advantages of algal protein as SCP? Mention how algae is used in traditional food. 4+4+2=10 (CO4)

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Part II (50)

Answer Q.1 and any two from the rest(Q2-Q5).

5x6+2x10

1. Explain the following: 5x6
 - a)grape vinegar and spirit vinegar.
 - b)metabolites produced by fermentation
 - c)spoilage of wine by acetic acid bacteria
 - d) semisynthetic penicillin
 - e) function of hops for beer production.
2. What is black strap molasses? Mention the steps of bioethanol production from sugar feed stock. How absolute alcohol is obtained after completion of fermentation ?
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2.5+3.5+4
3. What is antibiotic? Give an example of antibacterial antibiotic. What is meant by Penicillin resistant? State the spectrum of activity and mode of action of Penicillin.
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2+1+3+2.5+1.5
4. What is malt? Explain about malt adjuncts for beer production. 5+5
5. Write short notes on any two of the following: 2x5
 - a) Malo- lactic fermentation.
 - b) acetic acid bacteria for vinegar fermentation.
 - c) upstream and down stream processing of fermentation process.