Ref. No. : Ex/PG/FTBE/T/128C/2024

M.TECH. FOOD TECHNOLOGY AND BIO-CHEMICAL ENGINEERING FIRST YEAR SECOND SEMESTER – 2024

Subject : ADVANCED FOOD BIOTECHNOLOGY

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. Explain the method of microbial production of any one enzyme mentioning its source, fermentation condition and recovery. 10

2. What are the advantages and disadvantages of enzyme immobilization? Mention two application areas of immobilized enzyme. 4+4+2= 10

3. Biotechnological tools can be used to improve the taste and shelf life of food products- explain with any one example for each. 5+5=10

4. With respect to an example of any one food industry explain the type of waste generated from it and how it can be treated biologically to get valuable products from it. 10

5. Explain the mechanism of action of lactic acid bacteria as probiotic. What are the main requirement to consider any microorganism as probiotic? 6+4=10

6. What is the difference between pure enzymes and whole microbial cell immobilization? Give one example each for organic and inorganic matrix used for immobilization. What are the needs of cell disruption? Explain any two methods of cell disruption. 2+2+1+5=10

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ADVANCED FOOD BIOTECHNOLOGY

Time: 3 hrs **Full Marks: 100**

Part – II (Marks 50)

Answer any one question from question No 1 or 2 and any two from the rest.

1. What are the different sources of natural pigments used in food products? Classify natural pigments. Write their limitations. 4+4+2 = 10
2. Write the natural sources of nutraceuticals. Why these are procured from microorganisms? Give some examples of nutraceuticals produced by microorganisms. 4+3+3 = 10
3. Define probiotics. Write the beneficial effects of probiotics. What are the selection criteria of probiotics? Briefly describe the downstream processing and storage of probiotics. 2+3+6+9 = 20
4. What are the differences between bacteriocins and antibiotics? Classify bacteriocins. Briefly describe the mode of action of different bacteriocins. 3+8+9 = 20
5. Define prebiotics. What are the natural sources of prebiotics? What are the different types of prebiotics? Briefly describe the production process of FOS & GOS. 2+3+3+12 = 20
6. Briefly describe biotechnological approaches for food quality improvement. Describe the biofortification process. What are the advantages and disadvantages of genetically modified foods? 6+8+6 = 20