M.Tech. Second Semester (Membrane & Separation Tech.) (F.T.)

13031 : Industrial Biotechnology : 2 MST 2

P. Pages : 1 | **AV - 3380**

Time : Three Hours | Max. Marks : 80

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Notes : 1. Answer **any six** questions.
2. Due credit will be given to neatness and adequate dimensions.
3. Diagrams and chemical equations should be given wherever necessary.
4. Illustrate your answer necessary with the help of neat sketches.
5. Use of pen Blue/Black ink/refill only for writing the answer book.

1. Derive Michaelis-Menten equation and discuss the factors which affect microbial growth kinetics. **13**

2. Discuss the salient features of a batch culture system and a chemostat operation. **13**

3. What are enzymes? Discuss in details their role in biochemical reaction. Also explain the meaning of a bioreactor. **13**

4. Explain the design features of a fermentation process to achieve a desired product. Also explain fermentation mechanism. **13**

5. How are enzymes isolated and what are techniques available for enzyme immobilization? **13**

6. Discuss the importance of sterilization in a fermenter and what are the various sterilization techniques? **13**

7. How are antibiotics produced and discuss the importance of downstream processing. **13**

8. Discuss the importance of bioprocesses in food processing and discuss the importance of instrumentation in processing. **13**

9. a) Discuss the importance of bioprocesses in pulp and paper industries. **7**

b) How to achieve bioconversion of renewable resources to energy? **7**

10. Explain the following **any two.** **14**

i) Various membranes useful for sterilization.

ii) Bio refining and its applications in petroleum industries.

iii) Production of ethanol by fermentation.

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