

M. Tech. Second Semester (Membrane & Separation Tech.) (F.T.)  
**13031 : Industrial Biotechnology : 2 MST 2**

P. Pages : 1

Time : Three Hours



**AW - 3711**

Max. Marks : 80

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

1. Explain in details the Michaelis - Menten enzyme Kinetics mechanism in fermentation. Also explain the specific growth rate. **13**
2. What are enzymes? How it enhances the rate of biochemical reaction and explain its relationship with activation energy profile. **13**
3. How culture is grown in batch system and continuous system? Explain the operation of a chemostat? **13**
4. What are the advantages of immobilization of biocatalyst? Discuss the various techniques of immobilization. **13**
5. Discuss in details the salient features of fermentation and its various applications with suitable examples. **14**
6. Why sterilization is important in bio operations and how is air sterilization carried out? Also discuss membrane sterilization in fermenter. **13**
7. What are antibiotics? How are they produced? Explain in details. **13**
8. How bioconversion technology can be utilized to convert renewable sources to energy? Explain with suitable example. **13**
9. Discuss in details biorefining and its applications in petroleum industries. **13**
10. What are the various techniques to produce ethanol? How can it be generated by fermentation technique? Explain with a neat flow diagram. **14**

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