

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

**13031 : Industrial Biotechnology : 2 MST 2**

P. Pages : 1

Time : Three Hours



**AW - 3440**

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. How are microbial cultures grown in batch system? Also discuss the factors affecting microbial growth. 13
2. What is an ideal chemostat? Explain in details its salient features and applications. 13
3. What are enzymes and discuss their role in biochemical reaction and relationship with activation energy profile. 13
4. Discuss the classification of immobilized biocatalysts and what are the techniques of immobilization? 13
5. What are the main factors in sterilization protocol? Explain the various sterilization techniques and explain any one in details. 14
6. How are antibiotics produced and state the importance of downstream processing in antibiotics production? 13
7. What is fermentation? Discuss the various types and importance of measurement and instrumentation in operation. 13
8. How are vitamins produced by using biotechnology operations? Explain with suitable example. 13
9. How bioprocesses can be applied to pulp and paper industries and oil industries? Discuss in details with suitable example. 13
10. How is ethanol produced by fermentation? Explain with a neat sketch and state the applications of ethanol. 14

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