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53 (FPT 712) FRTC

2014

## FERMENTATION TECHNOLOGY

Paper : FPT 712

Full Marks : 100

Time : Three hours

*The figures in the margin indicate full marks for the questions.*

*Answer any five questions out of seven given.*

1. (a) Define fermentation. Distinguish between soil state fermentation and submerged fermentation. Write the advantages and disadvantages of submerged fermentation. 12
- (b) Explain the major sources of Fermentation media and their role in growth of Micro-organism. 8
2. What is Antibiotic ? How it is produced by microbial fermentation technique ? Also explain the various steps involved in the production of Antibiotic. 20

*Contd.*

3. Distinguish between the following : 7+6+7
- (a) Batch fermentation and Fed batch fermentation
  - (b) Aerobic fermentation and Anaerobic fermentation
  - (c) Bubble column bioreactor and packed tower bioreactor.
4. (a) Explain in detail the production of vitamin-B12. 16
- (b) Explain the applications of vinegar. 4
5. (a) Write in detail microbial fermentation of citric or lactic acid along with the downstream processing. 12
- (b) Write in detail the various strategies adopted for industrial production of ethanol. 8
6. (a) Enlist various bioreactors used in solid state fermentation. With a neat diagram explain the working principle of stirred tank bioreactor. Also write the advantages and disadvantages of stirred tank bioreactor. 14

(b) Enlist the various bioreactors used in submerged fermentation. What are the advantages and dis-advantages of trickle bed fermenter ? 6

7. (a) Describe the widely used upstream and downstream processes involved in microbial fermentation. 15

(b) Define Microfiltration. What are the membranes used for microfiltration technique ? 5