



### **SECTION-B**

- Q2. Describe briefly steps involved in the bioprocess development.
- Q3. What is heat transfer? Describe individual and overall heat transfer coefficient.
- Q4. What are fibrous filters? Describe the kinetics for the designing of fibrous filters for sterilization of air.
- Q5. Describe the oxygen requirements of a fermenter. Also highlight the factors affecting oxygen transfer rate.
- Q6. Describe the applications of bioprocess engineering in biotechnology industry.

### **SECTION-C**

- Q7. What is liquid gas mass transfer? Describe the oxygen uptake in cell culture. Also highlight the factors affecting cellular oxygen demand.
- Q8. Describe the microbial growth kinetics of continuous system.
- Q9. Describe the physical, chemical and mechanical methods of cell disruption with merits and demerits in each case.

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