



Your answers should be specific to the questions asked  
Draw neat labeled diagrams wherever necessary

**LONG ESSAY (Answer any FOUR)**

**4 X 25 = 100 Marks**

1. What are the factors affecting the absorption of oxygen in fermentation broth.
2. (a) Explain the techniques and theoretical considerations of scale up fermentation process.  
(b) Outline about the aeration system. (15+10)
3. (a) Outline about the aerobic and anaerobic fermentation media.  
(b) Air spargers.  
(c) Define agitation and explain mechanical and non mechanical agitation process. (10+5+10)
4. (a) Describe power consumption. Give an account about losses in the driving motors, transmission and gland losses, and power consumption by the impeller.  
(b) Sterile area in biological industries. (15+10)
5. (a) Describe theoretical basis of fermentation technology for industrial applications.  
(b) Importance of pH and temperature probes.  
(c) Ideal requirements for aerobic fermentation process. (15+5+5)
6. (a) Detail study about fed batch culture and its application.  
(b) Achievement and maintenance of aseptic condition.  
(c) Give an account about gradient plate techniques and its application. (15+5+5)

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