



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

**LONG ESSAY (Answer any FOUR)**

**4 X 25 = 100 Marks**

1. a) Write a note on enzymes. Explain the production of amylase  
b) Write on immobilized enzyme engineering
2. a) Explain in detail the optimization of fermentation parameters  
b) Describe the biosynthesis of erythromycin
3. a) Explain the production and applications of monoclonal antibodies  
b) Write about Hybrid DNA formation
4. a) Plant cell cultures as alternative sources of phytochemicals. Explain with examples  
b) Explain the media composition of plant cell cultures
5. Write on: 1) VDRL and Pregnancy test 2) Protoplast fusion  
b) Explain the economic importance of biotech products W.r.t. antibiotics
6. Write short notes on:
  - a) Penicillin
  - b) Estimation of molecular weight of proteins
  - c) Multi step immobilized enzyme systems
  - d) Urokinase
  - e) ELISA

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