Code No: C0301

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech I - Semester Examinations, March/April 2011
MICROBIAL ENGINEERING
(BIOTECHNOLOGY)

Time: 3hours   Max. Marks: 60

Answer any five questions
All questions carry equal marks

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1.   Give a general account of raw materials used for industrial fermentation & its
      processing.   [12]

2. a)   Describe the design of batch sterilization process.
   b)   How do you calculate del factor and holding time at constant temperature?
                                                                                         [6+6]

3. a)   How does steady state differ from equilibrium?
   b)   Explain mass-balance equation giving example.   [6+6]

4.   What are the various techniques used for medium optimization? Add a note on
      placket – Burman design.   [12]

5.   Explain the kinetics of substrate uptake in microbial cell cultures in the presence
      & absence of product formation.   [12]

6.   Illustrate the steady state systems incorporating recycle, bypass streams in
      bioprocess industries giving flow sheet.   [12]

7.   Write short notes on:
      a) Yield co-efficient & cell growth stoichiometry.
      b) Single cell model.   [12]

8.   Explain the model of gene expression kinetics giving the example of E.coli Lac
      promoter – operator.   [12]