

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]