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Total Number of Pages: 01

M.TECH
BTPE205

2nd Sem Regular/ Back Examination – 2015-16
BIOREACTOR DESIGN AND OPTIMISATION
Q.CODE:W959
Time: 3 Hours
Max marks: 70

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

- Q1 Answer the following questions: (2 x 10)
- a) What is the need of baffles?
 - b) Name the precautions taken for reducing foam formation in bioreactor.
 - c) Explain dilution rate in bioreactor operation.
 - d) What is perfusion reactor?
 - e) What is the liquid flow patron followed in a stirred tank reactor and justify it?
 - f) What is retention time factor in a bioreactor?
 - g) Differentiate between chemo-start and turbid-start?
 - h) What are the significant of fed-batch reactor?
 - i) Explain any two advantages of temperature control in bioreactor
 - j) Describe heterogeneous reaction with examples?
- Q2 a) Describe three – phase fluidized bed trickling bed reactor. (5)
- b) Explain fluidized bed bioreactor with proper diagram. (5)
- Q3 What is scale up? Explain the factors to be considered for scale up for a bioreactor. (10)
- Q4 Explain kinetics of CSTR reactors with Recycle and Wall growth. (10)
- Q5 a) Explain different physical sensors in bioreactors. (5)
- b) Explain role of oxygen transfer in bioreactor design. (5)
- Q6 a) What is plug flow reactor? Describe the basic design principles and kinetics of PFR? (5)
- b) Differentiate between air-lift and fluidized bed bioreactors. (5)
- Q7 Explain role of different mechanical fittings in the operation of bioreactor. (10)
- Q8 Write short notes on any two (5 x 2)
- a) Hollow fiber reactor
 - b) Online and offline sensors for a modern bioreactor
 - c) membrane reactor
 - d) Reactor stability