Total No. of Questions : 3]

SEAT No. :

P3117

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[5036]-302
M.Sc.
BIOTECHNOLOGY
BT - 302 : Bioprocess Engineering and Fermentation Technology
(2013 Pattern) (Credit System) (Semester-III)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary***
3) ***Figures to the right indicate full marks.***

Q1) Answer the following (any four) **[20]**

a) Enlist the non-mechanically agitated bioreactors used in fermentation industry. Describe the working and applications of fluidised bed reactor

b) Define Kha. Discuss the effect of

i) Microbial biomars &

ii) Agitation on Kha.

c) 'Auxotrophic mutants can improve the quality and yield of products' Justify giving examples.

d) What is the importance of realtime estimation of microbial biomass during fermentation? Discuss different methods of realtime estimation of biomass.

e) Why is cross flow filtration considered as more efficient method of filtration than conventional filtration? Explain.

f) Discuss giving examples the role of Precurssors in fermentation media.

Q2) Answer the following (any Four) **[20]**

a) What are Non-Newtonian fluids? Discuss different types of Non-Newtonian fluids with their rheogram giving their significance in fermentation.

b) Define / Attempt the following:

i) Variable volume fed Batch culture

ii) C_{crit}

P.T.O.

iii) Oxygen uptake rate

iv) Scale up

v) Ks

c) How is a batch sterilization process designed for fermentation?

d) Design the effluent disposal strategy for a dye Industry.

e) Discuss giving examples how recombinant DNA technology has contributed in strain improvement of a production strain.

f) Explain the classification of agitators on the basis of the flow patterns generated. What is the basis of selection of an Impellor for a particular process?

Q3) Answer the following question (any One) **[10]**

a) Describe a typical power curve for a baffeled vessel agitated by a falt blade turbine and give the relationship between Reynold's number, power numer and Power requirement in each regime.

b) discuss the strategy of down stream processing for

i) An antibiotic and

ii) Enzyme

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