Department of Biochemical Engineering & Biotechnology

Major Examination **Sem-II: 2007-08,**

BEL-401 (Bioprocess Technology)

Date 02.05.2008, **Time-8 am - 10 am**, Venue: II-378

Maximum Marks-50

Note: Answer all questions

Q.1 For a branched pathway to several products (amino acids) for cases given below, draw schematic pathways showing product inhibition and discuss the inhibition effects. Assume that the Cap-alphabet letters represent the metabolites, and the end products are represented by P1, P2, etc:

(a) Multivalent feed back inhibition
(b) Co-operative feed back inhibition.
(c) Inhibition by end products in case of preferential synthesis.

(4+4+4=12 marks)

Q.2 (a) Draw the un-branched metabolic pathway for the biosynthesis of Ornithine form Glutamate by a mutant of *Corneybacterium glutamicum*, and answer the following:

(b) Name the blocked enzyme.
(c) The mutant should be lysine-auxotroph (True/False)
(d) Name the amino acid, which will have to be added to the culture for this fermentation in controlled manner

(4+4+4=12 Marks)

Q.3 In xanthan gum production answer the following:

(a) Name two components, influencing the quality of xanthan gum
(b) Which major physical property of broth causes limitation on oxygen transfer rate in the xanthan gum production
(c) Why the cell growth curve leads the gum production curve
(d) Write steps involved in the recovery of xanthum gum

(4+4+4+4=16-marks)

Q.4 Compute theoretical value of ethanol-yield from glucose. In ethanol fermentation by *S. cerevisiae*, assuming that if maintenance effects are ignored, show that the ethanol-yield should be 86%.

(4+6=10-Marks)