Department of Biochemical Engineering & Biotechnology

Major Examination **Sem-II: 2008-09, BEL-401** (Bioprocess Technology)

Date 05.05.2009, **Time-1 pm - 3 pm**, Venue: II-337

Maximum Marks-45

Note: Answer all questions

Q.1 For conversion of glucose syrup to fructose+glucose syrup by immobilized cell pellets:

(a) Name the intracellular enzyme required for conversion

(b) Draw the process flow sheet and explain the purpose of each step

(2+4=6 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. **(4+2+2+2=10 Marks)**

Q.3 In production of glutamic acid by *Cornybacterium glutamicum*, name the blocked enzyme. Why excess of dissolved oxygen prevents overproduction of glutamic acid. **(4+4=8 marks)**

Q.4 In production of lysine by *Cornybacterium glutamicum*, starting from aspartate:

(a) draw the metabolic path showing inhibition by products (amino acids), name intermediates and enzymes including the products.

(b) Which enzyme is blocked

(c) Name the amino acids required to be added to the culture broth during fermentation

(d) Name the type of inhibition by the end products.

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

Q.5 Name the following organisms which can also use the sugar specified below as a carbon source (C-source) in addition to their capacity to use other sugars:

(a) an yeast which can use xylose

(b) an yeast which can use lactose

(c) a bacteria which can use cellobiose

(d) an yeast which can use both xylose and xylulose

(e) an yeast which can use maltotriose **(5-Marks)**