Agricultural & Food Engineering Department

Indian Institute of Technology Kharagpur- 721 302

M. Tech in Applied Botany Mid-semester Examination, 2010 Subject Name: Plant Metabolites & Separation Technology Subject No.: (AG60031) Full Marks: 30
No. of student: 25 Date of Examination: /0902010 (FN/AN) Time: 2h

Instruction: Answer any **three** questions

1 a) With suitable examples state the importance of purification steps in biological system?

b) Discuss elaborately the strategy of separation of ethanol from lignocellulosics fermentation, citric acid from fungal fermentation of corn starch and penicillin acylase produced by genetically engineered *E. coli.*

c) With suitable mathematical expression define plate number? What is its importance on the performance of any column? (2+5+3=10)

2. You have been supplied a mixture of enzymes along with the major contaminants as plant alkaloids. While characterizing the mixture, it has been seen that 15 proteins, 7 alkaloids, 3 phenolics and 2 flavonoids are present, you have been asked to purify your targeted protein which has got a neutral charge, but the molecular weight of three proteins including your targeted protein is very close to each other, what chromatographic procedure will you adopt to purify your targeted protein? (Pl. exclude the possibilities of considering SDS-PAGE/PI/Rotaphore/chromatofocussing). (10)

3. Write notes on: (any two)

a) Gradient elution and stepwise elution

b) Similarities and differences between IEC and HIC

c) Adsorption chromatography and elution chromatography (5x2=10)

4. a) How to characterize an anionic and cationic exchanger if unfortunately you find them unlabelled?

b) Discuss the techniques by which one can go for selection of weaker ion exchanger to strongest ion exchange (logically establish your answer with structure if needed). (5x2=10)