

M. TECH. IN FOOD TECHNOLOGY & BIOCHEMICAL
ENGINEERING EXAMINATION, 2019
(Second Semester)

MODERN SEPARATION AND PURIFICATION PROCESS

Time: Three hours

Full Marks: 100

PART-I (Marks -50)

(Use separate answer script for each part)

Answer any Three Questions. All questions carry equal marks.

1. Explain what do you mean by scale-up of Fixed Bed Adsorption. (16 2/3)
2. Describe the theoretical models for membrane processes including capillary flow model, solution diffusion model, and retention co-efficient. (16 2/3)
3. Discuss the theory of design and operational characteristics of microfiltration process. (16 2/3)
4. What are the significance of the mathematical expressions of ultrafiltration process? (16 2/3)
5. Discuss the method of protein precipitation by addition of salts. (16 2/3)
6. Discuss the steps of large scale precipitation processes influencing the kinetics including mixing of feed solution, nucleation, diffusion controlled flow, and flocculation. (16 2/3)
7. A broth of 80 litres contains the desired protein at 12.8 g/l as well as a contaminant protein at 1.8g/l. Calculate the ammonium sulphate concentration required to recover 98% of the desired protein if the precipitation constants b and k of the desired protein are 9.33 and 1.1 respectively and that of the contaminant protein are 8.8 and 0.95 respectively. What will the purity of the desired protein at 98% recovery? Explain the terms precipitation constants b and k . (16 2/3)

**M.TECH. FOOD TECHNOLOGY & BIOCHEMICAL ENGINEERING 1st
YEAR 2ND SEMESTER EXAMINATION 2019**

Modern Separation and Purification Process

Full Marks: 100

Time: 3hrs

Part-II

GROUP-A

Answer any one question

1×10 = 10

1. What is the importance of bio-separation processes? Mention different challenges of bio-separation processes?
2. Mention thumb rules for bio-separation. What are the basis of bio-separation?

GROUP-B

Answer any two questions

2×20 = 40

3. Briefly describe chromatogram. Explain resolution, NTP in a chromatogram. What are the different components of chromatographic system? 6+6+8 =20
4. What are the different components of Gas Chromatography? Briefly describe the effect of carrier gas system with HETP. What are the advantages of auto sampler? Briefly mention about different Gas Chromatography columns. 4+6+4+6 =20
5. What should be the characteristics of Gas chromatography detectors? Mention different types of detectors used in gas chromatography. Draw a schematic diagram of a Gas chromatography system. 6+8+6 = 20
6. Write the basic principle of Ion exchange chromatography. Write the selection criteria of ion exchange matrix. Light on the different applications of ion-exchange chromatography. 6+6+8 = 20