AQ–2742

Faculty of Engineering & Technology

M.Tech. (Membrane and Separation Tech.) (F. T.) Second Semester Examination

ADVANCED DOWNSTREAM TECHNOLOGY FOR CHEMICAL RECOVERY AND WASTE UTILIZATION

Paper—2 MST 1

Time—Three Hours] [Maximum Marks—80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Answer any **SIX** questions.

(3) Due credit will be given to neatness and adequate dimensions.

(4) Assume suitable data wherever necessary.

(5) Diagrams and Chemical equations should be given wherever necessary.

(6) Illustrate your answers wherever necessary with the help of neat sketches.

(7) Cell phones are strictly prohibited.

(8) Use pen of Blue/Black ink/refill only for writing the answer book.

1. Explain how to evaluate the performance of a centrifuge and explain the salient features of a tubular bowl centrifuge along with its applications. 13

2. What are the advantages of supercritical fluids over conventional solvents ? How can they be used for extraction of valuable products ? 13

3. Explain dialysis and its theoretical principles. Also discuss the salient features of hemodialysis. 13

4. How is mass transfer zone developed in an ion exchange column ? Discuss the diffusional resistances in the process and applications. 13

5. Discuss in detail, the salient features of azeotropic distillation and its important applications. 13

6 What is electrodialysis ? Discuss its salient features and applications in downstream processing operations. 13

7. How is solvent selected for extractivc distillation and discuss its salient features along with applications ? 13

8. What is pressure swing distillation ? Discuss the pressure drop estimation and the parameters of performance evaluation. 13

9. (a) Discuss the salient features of reactivc distillation. 7

   (b) What are the advantages of divided wall column technology ? 7

10. Explain the following :

   (i) Energy conservation in separation process.

   (ii) Gyogenic distillation for petrochemical off gases. 14