

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(NEW) – EXAMINATION – SUMMER 2019****Subject Code: 2160507****Date: 18/05/2019****Subject Name: Advance Separation Techniques****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) List the chemicals commonly used as supercritical solvent.	03
	(b) Explain the commercial applications of short path distillation process	04
	(c) Explain the concept of Reactive Distillation with a neat flowsheet and its application.	07
Q.2	(a) Compare short path distillation with molecular distillation.	03
	(b) What are the essential properties of a good supercritical solvent?	04
	(c) Discuss the Advance separation techniques applied in chemical industry and their benefits with example.	07
	OR	
	(c) Describe the manufacturing of ETBE by Reactive Distillation process. And compare with the conventional process.	07
Q.3	(a) List all the membrane based separation processes.	03
	(b) Draw flow sheet of batch super critical extraction.	04
	(c) Explain in detail the purification of hydrogen using six bed Pressure Swing Adsorption (PSA) technique.	07
	OR	
Q.3	(a) List the advantages of PSA over cryogenic distillation.	03
	(b) Explain the concept of Melt Crystallization.	04
	(c) Discuss principal of pressure swing Adsorption with one industrial application in details.	07
Q.4	(a) Draw a neat sketch of a cross-flow membrane process.	03
	(b) Define Nanofiltration and Explain factors affecting Nanofiltration.	04
	(c) Explain the concept of Reverse Osmosis (RO) and discuss in detail the use of RO in desalination process.	07
	OR	
Q.4	(a) Discuss working principle of Reverse Osmosis.	03
	(b) Write short note on Membrane cleaning.	04
	(c) Discuss working principle of Ultra Filtration and its industrial applications.	07
Q.5	(a) Write short note on membrane distillation.	03
	(b) Explain the working of a membrane reactor.	04
	(c) Write with neat sketch about different Modules used in membrane separation.	07
	OR	
Q.5	(a) Write commercial applications of Pervaporation.	03
	(b) Write short note on Nanofiltration.	04
	(c) Explain the concept of Pervaporation and describe in detail the manufacturing of MTBE by using pervaporation with neat sketch.	07
