

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3160507****Date:17-12-2022****Subject Name:Advanced Separation Processes****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	MARKS
Q.1 (a) Explain Separation factor	03
(b) Discuss equilibrium and rate governed separation	04
(c) Discuss drawbacks of the conventional separation processes	07
Q.2 (a) Write operating parameters of RO and NF membranes	03
(b) Explain in brief working principle of membrane processes	04
(c) List out different membrane modules. Discuss anyone in detail	07
OR	
(c) Discuss working principle of Nanofiltration membrane & write industrial applications for Nanofiltration membrane.	07
Q.3 (a) Enlist different materials used for membranes synthesis	03
(b) Discuss applications of membrane gas separation	04
(c) Explain Hybrid distillation-pervaporation system	07
OR	
Q.3 (a) Enlist different properties of supercritical fluids	03
(b) Enlist Synthesis methods of membrane. Explain anyone in brief	04
(c) Explain principle of pervaporation & list out different membranes used in pervaporation	07
Q.4 (a) Enlist any three advantages of supercritical extraction	03
(b) List out various types of membrane used for membrane reactor. Explain anyone	04
(c) Explain principle of designing of gas separator membrane using complete mixing model	07
OR	
Q.4 (a) Define reactive and catalytic distillation	03
(b) Discuss advantage and disadvantage of reactive distillation	04
(c) Explain manufacturing of Methyl Tertiary Butyl Ether (MTBE)	07
Q.5 (a) Discuss in brief Principle of chromatographic separation	03
(b) List out advantages and disadvantages of chromatographic separation processes	04
(c) Discuss commercial applications of supercritical extraction.	07
OR	
Q.5 (a) Write principle of electrophoresis process	03
(b) Enlist different factors affecting electrophoresis process	04
(c) Discuss chromatographic column Ion exchange chromatography	07
