

--	--	--	--	--	--	--	--	--	--



## GIET UNIVERSITY, GUNUPUR – 765022

M. Tech ( Third Semester - Regular) Examinations, December - 2020

### MPECH 3012- ADVANCED SEPARATION PROCESSES

(Chemical Engineering)

Time: 2 hrs

Maximum: 50 Marks

**The figures in the right hand margin indicate marks.**

**PART – A (2 x 10 = 20 Marks)**

Q.1. Answer *ALL* questions

- Differentiate between single stage and multi stage separation techniques along with examples.
- What are the recent types of separation techniques based on the size of separation
- What are the experimental techniques used to characterize the membranes?
- Explain about the concentration polarization
- What are different types of adsorbents used?
- What is the working principle of ultrafiltration process?
- Describe about retention time in a chromatographic separation technique
- What are the industrial applications of adsorption?
- What is thermal swing adsorption?
- What are the general types of chromatographic methods

**PART – B (6 x 5 = 30 Marks)**

Answer *ANY FIVE* questions

Marks

- What are the functions of dual functional filters (6)
- What is the process concept, theory and equipment used for cross flow filtration (6)
- Discuss the concentration profile and partial pressure profile for the transport of solute through membrane of various conditions (6)
- It is desired to pass water at 70°F through a supported, polypropylenemembrane, with a skin of 0.003 cm thickness and 35% porosity, at the rate of 200 m<sup>3</sup>/m<sup>2</sup>-day. The pores can be considered as straight cylinders of uniform diameter equal to 0.2 micron. If the pressure on the downstream side of the membrane is 150 kPa, estimate the required pressure on the upstream side of the membrane. The pressure drop through the support is negligible. (6)
- With a neat diagram explain the working principle of hollow fibre membrane reactors used for separation (6)
- Explain in brief about the liquid membranes and the principles of separation (6)
- Discuss the different sorption isotherms with the corresponding diagram (6)
- Explain in detail any ONE equipment used for the chromatography separation (6)

--- End of Paper ---