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**GIET UNIVERSITY, GUNUPUR – 765022**

M. Tech (Second Semester Examinations) – October' 2021

MPECH2031 – MEMBRANE TECHNOLOGIES FOR WATER AND WASTE WATER TREATMENT
(Chemical Engineering)

Time: 2 hrs

Maximum: 50 Marks

(The figures in the right hand margin indicate marks)**PART – A**Q.1. Answer **ALL** questions

(2 x 10 = 20)

- What is sedimentation?
- What is the importance of chemical potential in mass transfer?
- Write the classification of membrane separation process based on their driving forces.
- Differentiate between isotropic and anisotropic membrane.
- What do you mean by Molecular Weight Cut Off? What is its value for UF?
- Write the factors affecting the performance of NF membrane.
- What are limitations of continuous feed-and-bleed ultrafiltration?
- What is osmosis? Can it be used to separate a liquid mixture?
- Differentiate reverse osmosis and Nano filtration
- Write advantages of membrane separation process.

PART – B**(6 x 5 = 30 Marks)**Answer **ANY FIVE** questions

Marks

- Discuss about the area of industrial application of membraneseperation process. (6)
- Discuss about the different membrane modules with diagram. (6)
- Estimate membrane area and electrical-energy requirements for an electro dialysis process to reduce the salt (NaCl) content of 24,000 m³/day of brackish water from 1,500 mg/L to 300 mg/L with a 50% conversion. Assume each membrane has a surface area of 0.5 m² and each stack contains 300 cell pairs. A reasonable current density is 5 mA/cm², and the current efficiency is 0.8 (80%). (6)
- Explain about the basic principle of pervaporation and industrial application. (6)
- Discus about the mechanism of fouling in bio-processing. (6)
- Derive the expression for yield of solute in multi stage continuous fed and bleed Tangential Flow Filtration. (6)
- What are the different sources of chemical attachment of flocculants on membrane surfaces? Explain it. (6)

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