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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Petroleum Refinery Engineering) (EL-I 2013 Batch) (Sem.-6)

**SEPARATION TECHNIQUES**

Subject Code : BTPC-605A

M.Code : 74041

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A****1. Write briefly / Fill in the blanks :**

- a) Give two applications of MF.
- b) Explain the term Osmosis.
- c) Explain the term Semi Permeability.
- d) What is the effect of temperature on adsorption?
- e) What is reverse osmosis? What is a tubular membrane filter?
- f) How many membrane configurations are commercially available?
- g) Write the correlation to correlate adsorption data (where  $Y_{\max}$  is the maximum amount of solute adsorbed per mass of adsorbent,  $X$  is the mass fraction of solute in the diluent phase in solutefree basis,  $KL$  is a constant and  $Y$  is the equilibrium value of the mass of solute adsorbed per mass of adsorbent).
- h) In gas chromatography, the basis for separation of the components is the difference in .....
- i) In reverse phase chromatography, the stationary phase is made .....
- j) Electrophoresis of negatively charged particles (anions) is called .....

**SECTION-B**

2. Explain fouling of membranes, how you will prevent it.
3.
  - a) Explain the characteristics of the solids to be used in adsorption techniques,
  - b) Give the application of MF, UF RO processes.
4. What is an adsorption isotherm? Give the five types
5. Calculate the osmotic pressure of a solution containing 0.10gmol NaCl/1000g H<sub>2</sub>O at 25°C.  
  
Density of water = 997.0 kg/m<sup>3</sup>.
6. Give the types of chromatography and explain in detail Liquid chromatography separation system.

**SECTION-C**

7. Write note on Zone Electrophoresis.
8. Explain in detail various techniques of zone refining.
9. Explain the electric double layer ionic separation method.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**