

B.Tech I Year(R05) Supplementary Examinations, December 2010
APPLIED CHEMISTRY
(Civil Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. (a) Volumetric titration of 20 ml of CaCl_2 solution required 40 ml of 0.1M EDTA solution. Determine the hardness of CaCl_2 solution.
- (b) Two liters of water obtained from a well near Vijayawada showed the following analysis per liter: $\text{MgSO}_4 = 24$ mg; $\text{Ca}(\text{HCO}_3)_2 = 32.4$ mg; $\text{Mg}(\text{HCO}_3)_2 = 29.2$ mg; $\text{CaSO}_4 = 27.2$ mg; Suspended matter = 36 mg calculate the total hardness of the solution in ppm units. [6+10]
2. (a) Explain the process demineralization of brackish water.
- (b) Calculate the quantities in Kgs of lime-soda needed to soften 50,000 litres of water having the following composition:- Determine the quantities (in Kgs) of lime and soda required for softening 10,000 liters of water having the following salts: $\text{NaCl} = 58.5$ mg/liter; $\text{KCl} = 74.5$ mg/litre; $\text{Ca}(\text{HCO}_3)_2 = 40.5$ mg/litre; $\text{Mg}(\text{HCO}_3)_2 = 14.6$ mg/litre; $\text{Mg}(\text{NO}_3)_2 = 14.8$ mg/litre; $\text{CaSO}_4 = 13.6$ ppm. [8+8]
3. (a) Explain the differential aeration corrosion. [8]
- (b) Write proper reasons with suitable chemical equations involved for the faster corrosion of wire mesh at the joints. [8]
4. (a) Explain by illustrating with examples the protection of a metal by impressed current method and sacrificial anode method. [10]
- (b) Write short notes on pickling. [6]
5. (a) How are polymers classified based on
 - i. tacticity and [8]
 - ii. nature of monomer. [8]
- (b) Discuss the manufacture and uses of
 - i. Buna-S rubber [5]
 - ii. Buna-N rubber. [5]
6. (a) Explain
 - i. thermal spalling and
 - ii. porosity of refractories. [8]
- (b) Write briefly on
 - i. Silicone fluids and
 - ii. SF6 in electrical industry. [8]
7. Write brief notes on the following:-
 - (a) Cloud and pour point.
 - (b) Viscosity and viscosity index
 - (c) Flash and fire points of lubricants. [5+6+5]
8. How do you analyze the following during the analysis of cement?
 - (a) Calcium Oxide [8]
 - (b) Iron Oxide. [8]
