



12. (a) (i) Discuss in detail the kinetics of opposing reactions. (8)  
(ii) In a second order reaction, the initial concentration of the reactants is  $0.1 \text{ molL}^{-1}$ . The reaction is found to be 20% completed in 40 minutes. Calculate (1) the rate constant and (2) half life period. (8)

Or

- (b) (i) Derive Michaelis Menten equation. (8)  
(ii) Write an account on chain reactions. (8)

13. (a) (i) Explain the construction and working of Calomel electrode. (8)  
(ii) Calculate the standard electrode potential of  $\text{Cu}^{+2}/\text{Cu}$  if the electrode potential at  $25^\circ\text{C}$  is 0.296 V when  $[\text{Cu}^{+2}] = 0.015 \text{ M}$ . (8)

Or

- (b) (i) What is sacrificial anodic method? Mention its role in corrosion control. (8)  
(ii) Explain the mechanism of electro-chemical corrosion. (8)

14. (a) (i) Explain how will you determine hardness of water using EDTA method? (8)  
(ii) Narrate the various steps involved in obtaining safe drinking water. (8)

Or

- (b) (i) With a neat diagram explain the reverse osmosis method of desalination. (8)  
(ii) Describe the principle involved in the demineralization method for the treatment of water. What are the limitations and advantages of this method? (8)

15. (a) (i) Explain the free-radical mechanism of polymerization. (8)  
(ii) What are the moulding constituents of a plastic? Name and explain their function. (8)

Or

- (b) (i) With a neat diagram explain injection moulding. (8)  
(ii) With suitable example, explain addition and condensation polymerization. (8)