

**IV B.Tech I Semester Supplementary Examinations, April/May 2005**  
**ELECTROMETALLURGY AND CORROSION**  
(Metallurgy & Material Technology)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

\*\*\*\*\*

1. (a) How are end points determined in potentiometer titrations?  
(b) Explain the principle of working of PH meter.
2. (a) Define 'Molar conductivity'. What are the factors affecting conductivity of electrolytes? Describe how molar conductivity is measured?  
(b) Distinguish between E.M.F and GALVANIC series? Which is more useful and why?
3. (a) Write down various forms of Nernst equation. What is a concentration cell? Give examples. Write down Nernst equation for a concentration cell.  
(b) Explain the following terms:
  - i. Current efficiency
  - ii. Energy efficiency
  - iii. Decomposition potential. How does current density affect properties of electro deposits?
4. (a) What is meant by polarization and over potential? Describe its various forms.  
(b) What is Anodising? What are the properties of anodized oxide layers? Why are sulphuric baths preferred for commercial anodizing of aluminium?
5. (a) Justify the statement that aqueous corrosion is an electrochemical cell. Explain the mechanism of rusting of mild steel.  
(b) What is Galvanic corrosion? Explain the importance of area effect and distance effect with appropriate examples. Suggest the measures to minimize galvanic corrosion.
6. (a) Discuss the various mechanisms proposed for S.C.C.  
(b) What is passivation? Explain the role of passivation in corrosion control with examples.
7. (a) Compare electrical and Galvanic method of cathodic protection.  
(b) What do you understand by the terms sensitisation and stabilisation? Discuss the various measures to prevent inter granular corrosion.
8. Write short notes on three:
  - (a) Corrosion inhibitors

- (b) Electro-winning Vs Electro-refining.
- (c) Faraday's laws of electrolysis
- (d) Protective coatings
- (e) Protective coatings

★ ★ ★ ★ ★