

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

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
 All Questions carry equal marks

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1. (a) What is electro gravimetry ? Explain the constant current method of Electro-gravimetric Analysis  
 (b) Write a note on measuring instruments used in Electrochemistry. [8+8]
2. (a) Compare the conduction in metallic , aqueous and fused salt electrolytes.  
 (b) What do you mean by standard electrode potential? Draw the basic circuit for measurement of electrode potential and explain the principle of measurement. [8+8]
3. (a) Derive the Nernst equation  

$$E_M = E_M^o + \frac{RT}{nF} \ln \left( \frac{a_{reactants}}{a_{products}} \right)$$
 (b) What is hydrogen overvoltage ? What are the factors affecting hydrogen overvoltage ? Explain the importance of hydrogen overvoltage in electroplating and electrowinning of metals. [8+8]
4. (a) What is anodising ? Give examples of metals exhibiting anodising? How does anodising in sulphuric acid differ from anodising in other baths?  
 (b) Describe the treatments after anodising. [10+6]
5. (a) Differentiate between general and localised corrosion with examples. What are the methods of determining uniform corrosion rate ? Write down the units in which corrosion rate is expressed .  
 (b) How are stress corrosion failures identified ? Explain with examples . How S.C.C. is medium specific. [8+8]
6. (a) What are inhibitors ? How are they classified ? Explain the action of various inhibitors in corrosion control.  
 (b) What are sacrificial anodes ? Discuss the application of the method in corrosion prevention. [8+8]
7. (a) What is mixed potential theory of corrosion ? Explain how EVSI diagrams help in understanding corrosion phenomena ?  
 (b) Differentiate between weld decay and knife line attack. Why is Mo added to stainless steel? [8+8]
8. Write short notes on any four:

- (a) Determination of conductivity of electrolyses
- (b) Selective leaching
- (c) EMF and Galvanic series
- (d) Tests for thickness measurements of electro deposits
- (e) Passivation.

[4x4]

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