

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B. E. - SEMESTER – VI • EXAMINATION – WINTER 2012**

**Subject code: 162105****Date: 07/01/2013****Subject Name: Electrometallurgy & Corrosion****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

**Q.1 (a)** Define corrosion. Discuss about various factors affecting corrosion rate in detail. **07**

**(b)** What do you mean by high temperature corrosion? State and discuss about Pilling-Bedworth ratio and its applications. **07**

**Q.2 (a)** Explain the weight loss method for corrosion rate testing. Mention the applicability and limitations of weight loss method. **07**

**(b)** Describe the method of copper electroplating. Explain factors affecting electro-deposition. **07**

**OR**

**(b)** Mention the importance of material selection in corrosion protection. Explain how it is helpful to combat corrosion in petrochemical industries. **07**

**(b)** Describe the Pourbaix diagram for Fe-H<sub>2</sub>O system. Give its importance in corrosion study. **07**

**OR**

**Q.3 (a)** What do you mean by polarization? Explain the activation polarization. **07**

**(b)** Mention applications and limitations of Nernst's equation. Show how the electrode potential of Hydrogen electrode will vary with pH at one atmospheric pressure. **07**

**Q.4 (a)** Write a note on necessity of corrosion study. Discuss mechanism of crevice corrosion. **07**

**(b)** What is stress corrosion cracking? Discuss the causes and possible remedies of it. **07**

**OR**

**Q.4 (a)** Discuss mechanism of erosion corrosion. Mention the causes and way of combating erosion corrosion. **07**

**Q.4 (b)** What do you understand by pitting corrosion? Give the factors which increase pitting. Describe the different ways of prevention from pitting. **07**

**Q.5 (a)** What do you understand by inhibitors? Differentiate between anodic inhibitors and cathodic inhibitors. **07**

**(b)** Explain galvanizing process for corrosion protection. Compare it with tin plating method. **07**

**OR**

**Q.5 (a)** Explain the sacrificial anode cathodic protection method to combat corrosion. **07**

**(b)** Describe anodizing process. Give the role of barrier oxides in aluminum anodizing. **07**

\*\*\*\*\*