

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE SEM-V Examination-Nov/Dec.-2011****Subject code: 152105****Date: 03/12/2011****Subject Name: Industrial Corrosion and its Prevention****Time: 2.30 pm -5.00 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. Write and explain the Electrochemical principle of corrosion. **07**

**(b)** What is pitting corrosion? Mention the causes of pitting. Suggest different methods of prevention from pitting. **07**

**Q.2 (a)** What do you mean by e.m.f. series? Discuss its uses and limitations in corrosion studies. **07**

**(b)** What is Tafel plot? Describe the use of Tafel plot in corrosion study. **07**

**OR**

**(b)** What is Polarization? Explain different types of polarization. **07**

**Q.3 (a)** Describe the causes and possible remedies of erosion corrosion and intergranular corrosion. **07**

**(b)** With the help of suitable examples explain how the water quality affects corrosion in industries. **07**

**OR**

**Q.3 (a)** Discuss mechanism of Crevice corrosion. Give the causes and way of combating Crevice corrosion. **07**

**(b)** What is inhibitor? Discuss the mechanism of corrosion prevention by the use of inhibitors. Differentiate between cathodic and anodic inhibitors. **07**

**Q.4 (a)** Derive Nernst equation. Mention its uses in corrosion study. **07**

**(b)** Explain the need of corrosion testing. Describe the ASTM G 48 test for pitting corrosion testing. **07**

**OR**

**Q.4 (a)** What is high temperature corrosion? Mention Pilling-Bedworth ratio. Discuss its applications. **07**

**Q.4 (b)** What is corrosion rate? Explain the weight loss method for corrosion rate measurement. **07**

**Q.5 (a)** What do you mean by Metallic coating? Explain the difference between corrosion protection by noble coating and active coating with suitable examples. **07**

**(b)** Justify the role of proper material selection and design aspects in corrosion protection with suitable examples of each. **07**

**OR**

**Q.5 (a)** Explain important steps involved in electroplating. Name the factors affecting the quality of an electrodeposit. **07**

**(b)** Mention the different methods of corrosion prevention. Differentiate between cathodic and anodic protection of metals. **07**

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