

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER V • EXAMINATION – WINTER - 2012****Subject code: 152105****Date: 23-01-2013****Subject Name: Industrial Corrosion and Its Prevention (IE-II)****Time: 02:30 pm to 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) Explain electrochemical theory of corrosion with suitable examples. **07**
(b) Explain mechanism of inter granular corrosion. Describe methods to prevent it. **07**

- Q.2** (a) What is e.m.f. series? Discuss its applicability and limitations in corrosion studies. Compare it with galvanic series. **07**
(b) Define polarization. Enlist different types of polarization. Discuss about activation polarization. **07**

OR

- (b) Define and explain exchange current density. Give factors affecting exchange current density. **07**

- Q.3** (a) Discuss causes and possible remedial measures of selective leaching. Write a short note on dezincification. **07**
(b) Explain the cooling water system with suitable figure. Describe the effect of water quality on Cooling Water Corrosion. **07**

OR

- Q.3** (a) What do you understand by pitting corrosion? "Pitting is most dangerous form of corrosion" Discuss. **07**
(b) Discuss the effect of water quality on corrosivity in thermal power plants. **07**

- Q.4** (a) Derive Nernst equation for electrode potential. Mention applications and limitations of Nernst's equation in corrosion study. **07**
(b) What do you mean by Metallic coating? Explain the difference between corrosion protection by noble coating and active coating with suitable examples. **07**

OR

- Q.4** (a) Explain the mechanism of oxidation at high temperature. **07**
(b) Explain different methods of application of organic coating and point out their relative advantage and limitations. **07**

- Q.5** (a) Explain the need of corrosion testing. Describe the ASTM G 48 test for pitting corrosion testing. **07**
(b) Explain different methods of application of organic coating and point out their relative advantage and limitations. **07**

OR

- Q.5** (a) What do you mean by Tafel plot? Explain the use of Tafel plot in corrosion rate measurement. **07**
(b) Justify the role of proper material selection and design aspects in corrosion protection with suitable examples of each. **07**
