

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER- V • EXAMINATION – SUMMER 2015

Subject Code: 152105**Date: 15/05/2015****Subject Name: Industrial Corrosion and its Prevention (IE-II)****Time: 2.30PM-5.00PM****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) Justify the role of proper material selection and design aspects in corrosion protection with suitable examples. **07**
- (b) Discuss the significance of high temperature corrosion study. Write Piling-Bedworth ratio and its applications. **07**
- Q.2** (a) Explain electrochemical theory of wet corrosion with example of zinc in hydrochloric acid solution. **07**
- (b) What is e.m.f. series? Discuss its applicability and limitations in corrosion studies. **07**
- OR**
- (b) Derive Nernst equation for electrode potential. Mention its applications and limitations. **07**
- Q.3** (a) Discuss different causes, mechanism and way of prevention of pitting corrosion. **07**
- (b) Define erosion corrosion. Describe mechanism and way of prevention of erosion corrosion. **07**
- OR**
- Q.3** (a) Explain mechanism of inter granular corrosion in stainless steel. Describe different methods to prevent it. **07**
- (b) Define Pitting corrosion. "Pitting is most dangerous form of corrosion" Discuss. **07**
- Q.4** (a) Discuss about concentration polarization. Differentiate it with activation polarization. **07**
- (b) Explain the pitting corrosion testing by ASTM G 48 and ASTM G 61-78 techniques. **07**
- OR**
- Q.4** (a) Define corrosion rate. Explain the use of Tafel plot in corrosion rate measurement. **07**
- (b) Describe the effect of water quality on corrosivity in thermal power plants. **07**
- Q.5** (a) Define metallic coating. Explain the difference between corrosion protection by noble coating and active coating with suitable examples. **07**
- (b) Define Anodic protection. Explain anodic protection method to combat corrosion. **07**
- OR**
- Q.5** (a) Explain different methods of application of organic coatings and point out their relative advantage and limitations. **07**
- (b) Explain impressed current cathodic protection method. Write Advantages of it. **07**
