

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – WINTER 2013****Subject Code: 152105****Date: 09-12-2013****Subject Name: Industrial Corrosion and Its Prevention****Time: 10.30 am - 01.00 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 polarization. Enlist different types of polarization. Discuss about activation polarization. **07**

(b) Define corrosion. Derive Nernst equation. **07**

Q.2 (a) Explain Exchange current density and Corrosion rate. **07**

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

OR

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

Q.3 (a) What is pitting corrosion? Mention the causes of pitting. Suggest different methods of prevention from pitting. **07**

(b) Discuss causes and possible remedial measures of selective leaching. Write a short note on dezincification. **07**

OR

Q.3 (a) Define Inter granular corrosion and explain its mechanism. Describe methods to control Inter granular corrosion in stainless steel. **07**

(b) What is Inhibitor? Discuss the mechanism of corrosion prevention by the use of inhibitors. **07**

Q.4 (a) Explain Pilling-Bedworth ratio. Also give different high temperature oxidation rate laws with W vs. t plot **07**

(b) Discuss the effect of water quality on corrosivity in thermal power plants. **07**

OR

Q.4 (a) Explain the Pitting corrosion by ASTM G 48 and ASTM G 61-78 techniques. **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**

Q.5 (a) Explain different methods of application of organic coating and point out their relative advantages and limitations. **07**

(b) Compare the operation, mechanism, advantages and disadvantages of Hot dipping process with metal spraying process. **07**

OR

Q.5 (a) Explain corrosion due to Biological deposits (fouling) with figures. **07**

(b) What is cell potential? Derive a cell potential of Cu-Zn & Cu-Ag. **07**
