

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – SUMMER 2013****Subject Code: 162105****Date: 30-05-2013****Subject Name: Electrometallurgy and Corrosion****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) Discuss the importance of corrosion study. Explain factors affecting corrosion. 07
- (b) What is galvanic series? Describe its role in corrosion studies and limitations. Compare it with e.m.f. series. 07
- Q.2** (a) Describe the Pourbaix diagram for Fe-H₂O system and explain how it is useful in corrosion study. 07
- (b) Derive Nernst equation for electrode potential. Mention applications of Nernst's equation in corrosion study. 07
- OR**
- (b) What is high temperature corrosion? Write Pilling-Bedworth ratio and discuss its applications. 07
- Q.3** (a) Describe causes, mechanism and way of prevention of galvanic corrosion. 07
- (b) What is selective leaching? Explain with suitable examples? Mention its causes and possible remedial measures. 07
- OR**
- Q.3** (a) Pitting is most dangerous form of corrosion. Discuss. Describe the factors increase pitting. 07
- (b) Define erosion corrosion. Discuss causes, mechanism and way of prevention for erosion corrosion. 07
- Q.4** (a) Write Faraday's laws of electrolysis. Explain their role in corrosion study. 07
- (b) Enlist different methods of corrosion prevention. With the help of suitable examples explain how the proper material selection is helpful in corrosion control. 07
- OR**
- Q.4** (a) Define corrosion. Explain electrochemical theory of wet corrosion. 07
- (b) With the help of proper examples explain how the inhibitors are helpful to control corrosion. 07
- Q.5** (a) What is cathodic protection? Differentiate between sacrificial anode cathodic protection method and impressed current cathodic protection method. 07
- (b) With neat sketch of setup used, explain the Electroplating process. 07
- OR**
- Q.5** (a) What is Tafel plot? Describe its use in corrosion rate measurement. 07
- (b) Explain Galvanizing Process. Give its advantage and application. 07
