Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

IV SEMESTER B.TECH. (OPEN ELECTIVE 1)

END SEMESTER EXAMINATIONS, APRIL / MAY 2017

SUBJECT: CORROSION ENGINEERING [MME 3281]

REVISED CREDIT SYSTEM
(03/05/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Draw neat sketches wherever applicable

1A. Explain the following three consequences of corrosion with examples. **3**
a. Loss of products
b. Loss of efficiency
c. overdesign

1B. How corrosion can be termed as “extractive metallurgy in reverse”? **3**

1C. Explain with a suitable example, planned interval test with regard to corrosion testing. **4**

2A. Explain Activation and Concentration polarization. **3**

2B. Explain the characteristics of anodic and cathodic reactions. **3**

2C. How is a concentration cell formed? What are the different types of concentration cell that can form? **4**

3A. What is Corrosion Fatigue? Explain the effect of corrosion fatigue on the endurance limit of a material. **3**

3B. What is bimetallic corrosion? Explain its mechanism. List any four preventive techniques. **3**

3C. How do the following factors affect the corrosion rate? **4**
a. Nature of metal
b. ratio of cathode to anode
c. nature of corrosion product
d. pH of the medium

4A. Explain the term “weld decay”. How does it affect the integrity of a material? How can it be prevented? **3**

4B. How do cracks originate in case of SCC? Explain with the help of sketches? **3**

4C Explain the mechanism of pitting corrosion. Discuss any four factors that affect pitting corrosion? List any eight techniques that can be used to prevent pitting corrosion. **4**

5A. Explain the use of Tafel extrapolation method in measurement of corrosion rate. **3**

5B. A tank is to be protected from corrosion. The tank is to be used in an aqueous medium which has a pH value less than 3. Also, it is known that the material of the tank exhibits an active-passive behavior. Suggest and explain the most suitable prevention technique. **3**

5C. Discuss the objectives of “coatings” on substrate of materials. **4**