Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

A Constituent Institute of Manipal University, Manipal

V SEMESTER B.TECH (MECHANICAL/IP ENGG.) END SEMESTER EXAMINATIONS, NOVEMBER 2017

SUBJECT: PE – 1 CORROSION SCIENCE & ENGG. [MME 4015]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A.	"Inorganic materials are more corrosive in nature than organic materials". Justify this statement. Also list the reasons for the absence of corrosion in vacuum.	**03**
1B.	List down the basic reasons for corrosion study? Elaborate your answer.	**03**
1C.	With a neat sketch, explain the working of a Galvanic cell. Distinguish between a galvanic cell and electrolytic cell.	**04**
2A.	Distinguish between anode and cathode of a corrosion cell.	**03**
2B.	Why do we measure corrosion rate? Do corrosion rate measurement required for the study of Mechanism of corrosion? Comment.	**03**
2C.	Why uniform corrosion has least importance from engineering point of view? Does uniform corrosion occur in atmospheric medium only? What measures of control you will take, if you come across a case of uniform corrosion?	**04**
3A.	Why bolt and nut used for an application, should not be made of different materials? Explain. What do you mean by area effect in corrosion?	**03**
3B.	List the various conditions of pitting? Why pits generally grow downwards form the horizontal surface?	**03**
3C.	Define polarization. With the help of a sketch, explain Activation polarization. Discuss any two factors affecting Activation polarization.	**04**
4A.	Distinguish clearly between Stress corrosion cracking (SCC) and Corrosion fatigue.	**03**

4B. Discuss the following from corrosion prevention point of view: **03**

- Purity of metals
- Coatings
- Cathodic & anodic protection

4C. Explain the following types of inhibitors used in corrosion control: **04**

- Adsorption type of inhibitors
- Cathodic inhibitors
- Anodic inhibitors
- Vapour phase inhibitors

5A. Discuss the various purposes of corrosion testing. Distinguish between laboratory and field tests. **03**

5B. Discuss the importance of surface preparation, duration and exposure techniques in corrosion testing. **03**

5C. With a schematic representation, explain the Tafel extrapolation method used for corrosion testing. **04**