Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

V SEMESTER B.TECH (MECHANICAL/IP ENGG.) END SEMESTER EXAMINATIONS, NOVEMBER 2019

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

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.

1A. "Corrosion will be severe at higher temperatures". Why? Give reasons. Why corrosion does not occur in vacuum? Explain. **03**

1B. List any six consequences of corrosion. Explain briefly each one of them. **03**

1C. With a neat sketch, explain the working of an electrolytic cell. Distinguish clearly between a galvanic cell and electrolytic cell. **04**

2A. What do you mean by reference electrode? Why do we use it? Which type of reference electrode is the most commonly used? Draw a neat sketch of the same. **03**

2B. Explain the significance of corrosion rate? Why do we perform the corrosion rate study? Explain. **03**

2C. Why pitting corrosion is termed as the most dangerous form of corrosion from engineering point of view? Does this form of corrosion occur uniformly on the whole surface? If not, why? What measures of control you will take, if you come across a case of pitting corrosion? **04**

3A. What happens if the rivet and the plates on which it is used are made of different materials? Explain. What is the type of corrosion that occurs in this situation? Explain the significance of area effect in corrosion? **03**

3B. Which type of corrosion occurs due to the combined effect of cyclic stress and corrosive environment? List down the characteristics of this type of corrosion. **03**

3C. Define the term polarization. With the help of a sketch, explain Concentration polarization. Discuss any two factors affecting polarization. **04**

4A. Distinguish clearly between Stress corrosion cracking (SCC) and Intergranular corrosion. **03**

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

- Metals & alloys.
- Design.
- Cathodic protection.

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

- Anodic inhibitors.
- Cathodic inhibitors.
- Mixed inhibitors.
- Vapour phase inhibitors.

5A. What are the different types of corrosion tests performed? Distinguish between them. **03**

5B. Discuss the following with respect to corrosion testing: **03**

- Duration of test.
- Surface preparation after exposure.
- Aeration.

5C. Planned interval tests (PIT) are performed for corrosion rate measurement with respect to time/duration. Explain the testing procedure employed with a suitable example. **04**