Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PCMT 4403

Seventh Semester Examination – 2013

CORROSION AND DEGRADATION OF MATERIALS

BRANCH : MME

QUESTION CODE : C-170

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*
The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

   (a) Define polarization.

   (b) Explain cathodic protection with suitable examples.

   (c) Explain mechanism of corrosion.

   (d) What is hydrogen embrittlement ?

   (e) Why tin is coated on the baby food can ?

   (f) What is pilling Bedworth ratio ? Write the hydrogen electrode potential at room temperature.

   (g) How do you measure the corrosion rate ?

   (h) What is Emf series ? How is it useful in corrosion studies ?

   (i) Justify the statement : Zinc corrodes faster than steel coupled in aqueous solution.

   (j) Justify the statement : Steel is corroded faster than copper plate, if steel rivets on copper plates exposed to sea water.

2. (a) What is dezincification ? How do you minimize it ? 5

   (b) Explain inter-granular corrosion of stainless steels and prevention methods. 5

3. (a) Describe Wagner-Hauffe valence approach in alloy oxidation. 6

(b) Write short notes on corrosion and prevention of ceramic materials. 4

4. (a) Describe the corrosion prevention methods of different materials. 6

(b) What is high temperature corrosion? Suggest some prevention methods. 4

5. (a) Explain the mechanism of by-metallic corrosion. Suggest suitable prevention methods. 7

(b) What is weld-decay ? 3

6. (a) What is stress corrosion cracking ? Explain about season cracking and caustic embrittlement. 5

(b) How does the pH effect on erosion corrosion of steel ? 5

7. (a) Explain the mechanism of auto-catalytic process of pitting corrosion and factors affecting on it. 7

(b) What is stray current effect ? 3

8. Write short notes on any **two** : 5×2

(a) Selective leaching

(b) Anodic protection

(c) Pour box diagram

(d) Concentration polarization.