



# COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra.)  
SHIVAJI NAGAR, PUNE - 411 005

## END Semester Examination

### Corrosion and Surface Protection (TH) (SET-1) MT-14002

Course: B.Tech

Branch: Metallurgical Engineering

Semester: Sem VII

Year: 2014-2015

Max Marks: 60

Duration: 3 Hours Time: - 2 to 5 p.m.

Date: 24/11/2014

#### Instructions:

MIS No.

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1. Figures to the right indicate the full marks.
2. Mobile phones and programmable calculators are strictly prohibited.
3. Writing anything on question paper is not allowed.
4. Exchange/Sharing of anything like stationery, calculator is not allowed.
5. Assume suitable data if necessary.
6. Write your MIS Number on Question Paper

1. a) What is the equilibrium potential for the  $Fe^{2+}/Fe$  half cell at  $25^{\circ}C$ , when the concentration of  $Fe^{2+}$  ions in solution is  $10^{-6} M$ ,  $10^{-4} M$ ,  $10^{-2.5} M$ ,  $0.1 M$ ? 6  
b) Iron piece exposed to an environment shows corrosion current density of  $1 \mu A/cm^2$ . What will be corrosion rate of iron in mpy? (At.wt. 55.8, density 7.86 g/cc, no. of electrons lost = 2) 6
2. a) Explain salient features of salt spray test and which ASTM standard is referred to perform this test. 6  
b) With suitable sketch discuss anodic protection method. 6
3. a) How cathodic protection is effectively applied to minimize stray current effects? Explain with suitable example and sketch. 6  
b) Why inhibitors are added in sufficient quantity and their concentration is checked periodically? 6
4. a) Discuss prevention methods of intergranular corrosion in austenitic SS. 6  
b) Which factors affect corrosion corrosion? 6
5. a) Metal exposed to a solution shows potential of 1.0 V w.r.t. standard hydrogen electrode. What would be its potential Vs saturated calomel electrode (SCE), and  $Cu/CuSO_4$  reference electrode? 6  
b) Which metallurgical factors influence corrosion phenomena? 6

END