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ctions: H,I,J,K,L,M&N

NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belgaum)

II Sem B.E. (Credit System) Mid Semester Examinations – II, March 2014

13CY110 – ENGINEERING CHEMISTRY

ation: 1 Hour | Max. Marks: 20

*Note: Answer any **One** full question from **each Unit.***

Unit – I

a) Describe the corrosion of iron based on electrochemical theory. 4

b) Discuss the following factors affecting the rate of corrosion

i) Nature of corrosion product ii) pH 3

c) Explain the construction and working of CH_3OH-O_2 fuel cell. 3

a) Write a note on waterline corrosion and pitting corrosion. 4

b) What is metal coating? Explain the process of galvanization. 3

c) Define polarization. Describe any four factors affecting polarization. 3

Unit – II

a) What causes alkalinity in water? During alkalinity determination, 100 ml of water sample required 10.8 ml of N/10 HCl till phenolphthalein end point. Another 5.2 ml of the same acid was further added for neutralization to methyl orange end point. Determine the type and amount of alkalinity. 5

b) Describe hot lime soda process for softening of boiler feed water. 5

a) Explain the Winkler's method to determine the dissolved oxygen in water. 5

b) Write a note on boiler corrosion. 5

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NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belgaum)

I Sem B.E. (Credit System) Mid Semester Examinations – I, September 2014

14CY110 – ENGINEERING CHEMISTRY

Duration: 1 Hour | Max. Marks: 20

*Note: Answer any **One** full question from **each Unit.***

Unit – I

1. a) Helmholtz electrical double layer is the cause for origin of single electrode potential. Discuss. 3

   b) A cell is constructed by coupling Zn rod dipped in 0.5M $ZnSO_4$ and Ni rod dipped in 0.05M $NiSO_4$ solution. Write the cell representation, cell reaction and calculate the emf of the cell, given that standard reduction potentials of Zn and Ni are -0.76 and -0.25V respectively. 3

   c) What are ion-selective electrodes? Explain the experimental method of determination of pH of a solution using glass electrode. 4

2. a) Derive Nernst equation for single electrode potential 3

   b) With a note on construction of calomel electrode, explain how its potential is a function of $[Cl^-]$. 3

   c) Describe the construction of Pb-acid battery and give the reactions that occur during discharge. Mention its applications. 4

Unit – II

3. a) Discuss the mechanism involved in free radical addition polymerization of styrene 5

   b) What is glass transition temperature? Discuss any four parameters affecting the glass transition temperature 5

4. a) Explain the manufacture and applications of the following: (i) Polymethylmethacrylate, (ii) Phenol-formaldehyde 5

   b) Write a note on bead and emulsion polymerization 5

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