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NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belgaum)

II Sem B.E. (Credit System) Mid Semester Examinations – I March 2013

12CY110 – ENGINEERING CHEMISTRY

ation: 1 Hour

Max. Marks: 20

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

Unit – I

a) What are concentration cells? Derive an expression for EMF of a concentration cell. 03

b) What are reference electrodes? Describe the construction and working of the calomel electrode .Give any two applications of Ag-AgCl electrode. 04

c) Explain the construction, working and application of Zn – MnO_2 battery. 03

a) What are reserve batteries? Describe the construction, working and application of Ni – MH battery. 04

b) Explain the experimental method for the determination of pH of a solution using glass electrode. Mention the advantages of glass electrode. 03

c) A cell is formed by coupling Ni-Pb in 0.1M $NiSO_4$ and Pb rod dipped in 0.06M $PbSO_4$ Write cell representation, cell reactions. Calculate the EMF of the cell, given that standard reduction potentials of Ni and Pb as -0.24 and -0.13volts respectively. 03

Unit – II

a) What is glass transition temperature? Explain the factors affecting Tg. 05

b) Give the synthesis and application of the following polymers: 05
(i) Penol-formaldehyde resin (ii) Butyl rubber

a) Discuss the mechanism involved in free radical polymerization of polystyrene. 05

b) Explain the following (i) Compression moulding (ii) Injection moulding 05

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ions: G, H, I, J, K & L

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NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belgaum)

II Sem B.E. (Credit System) Mid Semester Examinations – II, April 2013

12CY110 – ENGINEERING CHEMISTRY

tion: 1 Hour Max. Marks:20

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

Unit – I

a) What are fuel cells? Explain the construction and working of CH_3OH-O_2 fuel cell. 4

b) Explain the following factors affecting the rate of corrosion.
(i) Nature of the corrosion product; (ii) Hydrogen overvoltage 3

c) Describe the method of corrosion inhibition by anodic and cathodic inhibitors. 3

a) Define metallic corrosion. Explain the mechanism for rusting of iron based on electrochemical theory. 4

b) Describe the tinning process for corrosion control. 3

c) What is decomposition potential? How is it determined? 3

Unit – II

a) Explain the experimental method of determination of hardness of water by EDTA method. 5

b) What is a scale? Explain the causes and disadvantages of scale formation in boilers. 5

a) Define alkalinity in water. While analyzing a water sample to determine alkalinity, 100ml of sample water consumed 12.4ml of N/50 H_2SO_4 till phenolphtlein end point. On further titration of the reaction mixture using methyl orange indicator, the total consumption of N/50 H_2SO_4 was 17.8 ml. Determine the type and extent of alkalinity. 5

b) Describe the ion-exchange method for softening of hard water. 5

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