USN | | | | | | | | | | |

NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belagavi)

II Sem B.E. (Credit System) Mid Semester Examinations - II, March 2017

16CY110 – ENGINEERING CHEMISTRY

Duration: 1 Hour | Max. Marks: 20

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

			Marks	BT*
		Unit – I		
1.	a)	Describe the construction and working of Li – ion battery.	4	L*2
	b)	Explain the following factors influencing the rate of the corrosion: i) Electrode potential; ii) pH	3	L4
	c)	Explain the techniques of cathodic protection	3	L2
2.	a)	Explain the electrochemical theory of corrosion taking rusting of iron as an example.	5	L2
	b)	What is anodization? Explain anodization of aluminum.	3	L2
	c)	Give reason: i) Zinc corrodes faster than aluminum although it is below aluminum in the electrochemical series. ii) Pin holes or scratches on zinc-coated iron articles are less harmful to iron than those over tin-coated iron ones.	2	L5
		Unit – II		
3.	a)	Describe the determination of temporary and permanent hardness of water by complexonetric method.	5	L2
	b)	Write a note on electrodialysis and reverse osmosis.	5	L2
4.	a)	Explain the hot-lime soda process for softening of hard water.	5	L2
	b)	Define BOD and COD. 25 mL of an industrial effluent sample requires 8.3 mL of 0.001M $K_2Cr_2O_7$ for complete oxidation. Calculate the COD of the sample.	5	L4

BT* Bloom's Taxonomy, L* Level

****

USN | | | | | | | | | | |

NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belagavi)

II Sem B.E. (Credit System) Mid Semester Examinations - I, February 2017

16CY110 – ENGINEERING CHEMISTRY

Duration: 1 Hour | Max. Marks: 20

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

			Marks	BT*
		Unit – I		
1.	a)	Give the free-radical mechanism of addition polymerization taking styrene as an example.	5	L*3
	b)	Give the synthesis and applications of the following polymers. i) Phenol-formaldehyde resin ii) Silicone rubber	3+2	L4
2.	a)	Define glass transition temperature. Explain any four factors influencing glass transition temperature.	5	L3
	b)	List any five deficiencies of natural rubber and give the synthesis and applications of epoxy resin.	5	L3
		Unit – II		
3.	a)	Derive the Nernst equation for a single electrode potential.	3	L3
	b)	What are reference electrodes? Compute the cell potential of the Ag^+/Ag couple with respect to Ni^{2+}/Ni, if the concentration of Ag^+ and Ni^{2+} are 5.1×10^{-6} M and 2.3×10^{-3} M respectively. $E^0_{Ag^+/Ag}$ =0.80 V, $E^0_{Ni^{2+}/Ni}$ = - 0.23 V	3	L4
	c)	Give the construction, working and any two applications of Pb-acid Battery.	4	L4
4.	a)	i) Nickel spatula cannot be used in $CuSO_4$ solution. Why? ii) Calomel electrode is reversible with respect to the chloride ion concentration. Justify.	2	L4
	b)	What are ion-selective electrodes? Explain the determination of pH of a solution using glass electrode.	4	L3
	c)	Explain construction working and application of dry cell.	4	L2

BT* Bloom's Taxonomy, L* Level

****

USN | | | | | | | | | | |

NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belagavi)

I Sem B.E. (Credit System) Mid Semester Examinations - II, October 2017

17CY110 – ENGINEERING CHEMISTRY

Duration: 1 Hour | Max. Marks: 20

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

			Marks	BT*
		Unit – I		
1.	a)	Explain the electrochemical theory of corrosion taking iron as an example.	4	L*3
	b)	Wrtie a note on (i) Sacrificial Anode Method (ii) Pitting Corrosion	4	L2
	c)	Cathodic metal coating must be continuous in order to prevent corrosion of base metal. Justify.	2	L5
2.	a)	Elaborate on the role of corroision inhibitors in corrosion prevention.	4	L2
	b)	How the following factors affect rate of corrosion? (i) Nature of corrosion product (ii) pH	3	L4
	c)	Describe the construction and working of H_2-O_2 fuel cell. Mention its one application.	3	L1
		Unit – II		
3.	a)	Explain the hot lime soda process for softening of hard water.	5	L1
	b)	Explain the conduction mechanism in polyacetylene.	5	L2
4.	a)	Describe the Winkler's method to determine Dissolved Oxygen in water.	5	L2
	b)	Explain the Reverse Osmosis and Electrodialysis methods of desalination.	5	L2

BT* Bloom's Taxonomy, L* Level

****