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BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

July / August 2017 Supplementary Semester Examinations

Course: Engineering Chemistry
Course Code: 14CY11CCHY/ 14CY21CCHY

Duration: **3 hrs**
Max Marks: **100**
Date: 25.07.2017

Instructions: **1.Answer any five full questions choosing one from each unit.**

UNIT 1

1	a)	What is hardness of water? Explain how it is determined using EDTA ?	7
	b)	Determine COD value of 20 cm^3 of waste water sample, which reacted with 10 cm^3 of 0.25 N $K_2Cr_2O_7$. The unreacted $K_2Cr_2O_7$ needed 7.5 cm^3 of 0.1025 N FAS. When distilled water sample was used with the same volumes, it consumed 27 cm^3 of the same FAS.	6
	c)	Explain desalination of water by electrodialysis process.	7

UNIT 2

2	a)	What are ion selective electrodes? Discuss experimental determination of pH of a solution using glass electrode.	7
	b)	Calculate emf of a cell containing Ag and Cd electrodes, dipped in a solution of 0.4M silver nitrate and 0.16 M cadmium sulphate respectively at 25^0C. Given standard reduction potential of Ag is 0.8V and of Cd is - 0.4 V.	4
	c)	Discuss the following characteristics of a battery. i) Voltage ii) Capacity and iii) Energy efficiency.	9

UNIT 3

3	a)	Define net calorific value? How is it determined for a coal sample by using Bomb Calorimeter?	6
	b)	Calculate net calorific value of 1.15kg fuel taken in a bomb calorimeter. The temperature of 3.5kg of water increased from 26.5 ^{0}C to 28.5 ^{0}C. The water equivalent of calorimeter and Latent heat of steam are 325g and 2485 kJ/kg respectively. Specific heat of water is 4.187 kJ/kg/^{0}C. Fuel contains 4%H.	4
	c)	Explain the production of synthetic petrol by Fischer-Tropsch process.	6
	d)	Write any two physical and two chemical properties of silicon relevant to photovoltaics.	4

OR

4	a)	Discuss octane number, cetane number and knocking in petrol engine.	9
	b)	What is reforming of petrol? Write any four reactions.	5
	c)	Show schematic representation of p-n junction in silicon based solar cell and explain its working mechanism.	6

UNIT 4

5	a)	Explain the mechanism of corrsion of iron metal under atmospheric condition by electrochemical theory.	6
	b)	Discuss differential metal corrosion and differential aeration corrosion with suitable example.	8
	c)	Summarize the role played by corrosion inhibitors in corrosion control of iron objects.	6

OR

6	a)	Discuss the significances of polarization, decomposition potential and over voltage in electroplating processes.	9
	b)	Explain electroplating of chromium with reactions.	5
	c)	What is electroless plating? Write any four distinctions between electroplating and electroless plating.	6

UNIT 5

7	a)	Discuss the polymerization method in which micelle formation occurs.	5
	b)	What is Tg? Write any three structural properties of polymers that influence the Tg.	5
	c)	Explain the preparation of Epoxy resin with reactions. Mention its uses.	5
	d)	Define number average molecular weight and weight average molecular weight of polymers.	5

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