Code No: 19SHT103 **R19**

I B. Tech I Semester Regular Examinations, Jan - 2020
ENGINEERING CHEMISTRY
(CIVIL ENGINEERING)

Time: 3 hours Max. Marks: 60

Note: Answer **ONE** question from each unit (**5 × 12 = 60 Marks)**

UNIT - I

1.	a)	Explain the fabrication of plastic materials using compression molding method.	(3M)
	b)	Illustrate the preparation of Bakelite and state the properties and applications.	(5M)
	c)	Write a detailed note on biodegradable polymers.	(4M)
		(OR)	
2.	a)	Give the preparation method and discuss properties and applications of polyurethanes.	(4M)
	b)	Write a detailed note on fiber reinforced plastics	(4M)
	c)	Illustrate the mechanical properties of polymers.	(4M)

UNIT – II

3.	a)	Describe the construction of calomel electrode. What is saturated calomel electrode (SCE) and why this electrode chosen as reference electrode?	(5M)
	b)	What is the driving force for differential aeration corrosion? Explain with one example.	(3M)
	c)	Illustrate electroplating, electro-less plating with suitable examples.	(4M)
		(OR)	
4.	a)	Describe the construction and working principle Ni-Cd cells using electrode reactions.	(4M)
	b)	Illustrate the working principle and construction of a phosphoric acid fuel cell.	(4M)
	c)	What are the constituents of paints that are used to control the corrosion of iron and state their functions?	(4M)

UNIT – III

5.	a)	Give the applications of fullerenes.	(3M)
	b)	Discuss the role of silica ratio (SR), and alumina ratio (AR) in clincker formation.	(4M)
	c)	Mention some important refracting materials. Describe manufacture, properties and uses for one of basic refractories.	(5M)
		(OR)	
6.	a)	Discuss about the porosity and thermal spalling of refractories.	(4M)
	b)	Explain the mechanism of lubrication with a suitable example.	(3M)
	c)	What is cement? Describe the composition of any cement. Briefly describe its manufacture.	(5M)

UNIT –IV

7.	a)	Illustrate refining of petroleum.	(4M)
	b)	What are the advantages and disadvantages in using of liquid and gaseous fuels?	(4M)
	c)	C=70%, O=10%, N=1%, S=5% and ash=4%. The NCV of the fuel was found to be 9210 cal/g. percentage of hydrogen be x and HCV of the fuel be y. Find out x and y.	(4M)

(OR)

8.	a)	What is flue gas? Analyze flue gases by using Orsat method.	(4M)
	b)	Explain the ultimate analysis to find the quality of coal.	(4M)
	c)	Write Dulong's formula for HCV. Mention the terms involved in it.	(4M)

UNIT –V

9.	a)	Outline a method to soften the water.	(3M)
	b)	Describe break point chlorination and state its significance.	(4M)
	c)	Calculate the temporary and permanent hardness of water sample containing $Mg(HCO_3)_2$ = 7.3 mg/L, $Ca(HCO_3)_2$ = 7.3 mg/L, MgCl = 9.5 mg/L and $CaSO_4$ = 13.6 mg/L.	(5M)

(OR)

10.	a)	Describe caustic embrittlement and state how it is controlled.	(4M)
	b)	Describe the methods of disinfection of water. Why is chloramine better than chlorine for sterilization of water?	(4M)
	c)	Illustrate the process of electro dialysis.	(4M)

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