Code No.: CH102BS | R20 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE:: HYDERABAD
UGC AUTONOMOUS
I–B.TECH–I–Semester End Examinations (Regular) - April- 2022
ENGINEERING CHEMISTRY
(Common to CSM, ECE, AI&DS)

[Time: 3 Hours] **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(20 Marks)**

1.	a)	Define hardness of water? Differentiate between temporary and permanent hardness of water.	[2M]
	b)	What are the specifications of potable water?	[2M]
	c)	Calculate the bond order of O_2 molecule.	[2M]
	d)	Identify any four salient features of CFT.	[2M]
	e)	What is a battery and write its classification.	[2M]
	f)	Derive nernst equation for single electrode potential.	[2M]
	g)	Distinguish between Octane number and Cetane number of a fuel.	[2M]
	h)	Calculate the GCV and HCV of a fuel having the following composition C=85%, H=8%, S=1%, N=2%,Ash=4%,latent heat of steam=587 cal/g.	[2M]
	i)	Define biodegradable polymers and write its applications.	[2M]
	j)	Write a short note on galvanic corrosion.	[2M]

PART-B **(50 Marks)**

2.	Explain the principle of EDTA method? Describe the estimation of hardness of water by EDTA method.	[10M]
	OR	
3.	Summarize a short note on the following a) Phosphate conditioning b) Caustic embrittlement c) Ozonization	[10M]
4.	Draw the molecular orbital diagram of N_2 and find out the bond order.	[10M]
	OR	
5.	Explain conductors and insulators on the basis of band theory and give importance of doping on conductance.	[10M]
6.	Describe the construction and working of calomel electrode with a neat diagram.	[10M]
	OR	
7.	What are secondary cells? Explain the construction and working of lead acid battery. Write down the reactions taking place during charging and discharging.	[10M]
8.	Explain the determination of calorific value of a gaseous fuel using a Junkers gas calorimeter.	[10M]
	OR	
9.	Explain the determination of Ultimate analysis of coal and write its significance.	[10M]
10.	Analyze the doping mechanism of conduction in poly acetylene(p-doping & n-doping)	[10M]
	OR	
11.	Discuss the preparation, properties and applications of Bakelite and Buna-S.	[10M]

****