CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–B.TECH–II–Semester End Examinations (Supply) - September- 2023
ENGINEERING CHEMISTRY
(Common for CSE, IT, CSD, CSC)

[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)	How the cation and anion-exhausted resins can be regenerated.	[2M]
b)	What is meant by caustic embrittlement? How do you prevent it?	[2M]
c)	What is the bond order of O_2?	[2M]
d)	List out the salient features of molecular orbital theory.	[2M]
e)	Discuss any two applications of the Nernst equation.	[2M]
f)	What are fuel cells, and list their applications?	[2M]
g)	Distinguish between proximate and ultimate analysis.	[2M]
h)	Discuss about knocking.	[2M]
i)	Explain the sacrificial anodic protection method.	[2M]
j)	How is nylon 6,6 formed? List out its uses.	[2M]

PART-B   (50 Marks)

2.a)	What are the specifications of portable water and what are the steps involved in the treatment of municipal water supply?	[7M]
b)	Explain the breakpoint of chlorination.	[3M]

OR

3.a)	Discuss the principle involved in the EDTA method.	[4M]
b)	Explain the Estimation of the hardness of water by the complexometric method.	[6M]

4.	Explain the π molecular orbitals of butadiene and benzene.	[10M]

OR

5.a)	Discuss the salient features of crystal field theory.	[4M]
b)	Explain the crystal field splitting pattern of d-orbitals in tetrahedral geometry.	[6M]

6.a)	How is the pH of a solution determined by Glass electrode? Discuss.	[7M]
b)	Solve the EMF of the following cell: $Zn/ZnSO_4$(1M) // $CdSO_4$(1M)/Cd. E^0_{Zn} = -0.76V and E^0_{Cd} = -0.4V.	[3M]

OR

7.	With a neat sketch, explain the functioning of a methanol-oxygen fuel cell and bring out its advantages and disadvantages.	[10M]

8.	Explain the proximate analysis of coal and its significance.	[10M]

OR

9.a)	What is cracking? Discuss the process of fixed-bed catalytic cracking.	[7M]
b)	Explain about octane number of petrol.	[3M]

10. What is oxidation corrosion? Explain the mechanism behind it. [10M]

OR

11.a) How is bakelite prepared? What are its properties? [5M]

b) Explain the mechanism of free radical polymerization. [5M]

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