



QuestionPaperCode: CH202BS

ACE-R20

Semester End Examination
I B. Tech- II Semester- September - 2021
Engineering Chemistry
(Common to CE,MECH,ECE,CSM,CSO)

Time: 3 Hours

Max. Marks: 70

H. T. No

Answer any five full questions from the following. All Questions carry equal marks.

M=Marks; CO=Course Outcomes; PO= Program Outcomes

Q.No	Question	M	CO	PO
1. a)	What are the salient features of molecular orbital theory? Draw the molecular orbital diagrams of O ₂ and determine its bond order and magnetic moment.	7	1	PO1
b)	Use the molecular orbital energy level diagram to show that N ₂ would be expected to have a triple bond, F ₂ a single bond.	7	1	PO1
2.a)	What are doped conducting polymers? Discuss the n-doping and p-doping with examples.	6	1	PO2
b)	Draw the molecular orbitals of butadiene and benzene.	4	1	PO1
c)	Draw the crystal field splitting of d- orbitals in octahedral complexes.	4		PO2
3.a)	Define Boiler Feed Water. What are the specifications of Boiler Feed Water?	7	2	PO12
b)	Calculate the temporary, permanent and total hardness of a water sample which contains the following salts per litre and express it in ppm and degree French Ca(HCO ₃) ₂ =81mg, Mg(HCO ₃) ₂ =14.6mg, MgSO ₄ =30mg, CaCl ₂ =11.1mg, MgCl ₂ =19mg.	7	2	PO2
4. a)	Describe the determination of pH of a solution using glass electrode with a neat diagram	5	2	PO12
b)	Write construction, working and applications of lithium ion battery with chemical reactions involved during charging and discharging	5	2	PO2
c)	Derive Nernst equation of single electrode potential	4	2	PO12
5. a)	What are metallizing coatings? Describe the method of hotdipping.	5	3	PO1
b)	Explain the mechanism of electrochemical theory of corrosion for rusting of iron in acid medium with a diagram.	5	3	PO2
c)	How to your protect the ship hulls from corrosion? Explain.	4	3	PO2
6. a)	Explain differences in reactivity of LiAlH ₄ and NaBH ₄	7	4	PO2
b)	Write the synthesis, properties and applications of the following polymers. i)Nylon-66 ii) Bakelite	7	4	PO1

7.a)	Explain differences between E1 and E2 reactions with examples.	7	4	P01
b)	Explain stability of the n-butane with energy level diagram.	7	4	P01
8. a)	Discuss the principle involved in IR spectroscopy.	4	4	P01
	Give the applications of IR spectroscopy .	2	4	P02
b)	Give the differences between addition and condensation polymerization.	4	5	P02
c)	Discuss the classification, properties and applications of ceramics.	4	5	P012