

## Model Question Paper

Total Duration (H: M): 3:00

Course: Engineering Chemistry

Maximum Marks:100

**Note: Attempt all questions. All questions carry equal marks.**

### Course Outcomes:

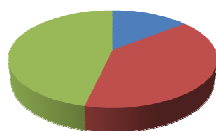
1. To bridge the knowledge of chemical science with technical aspect of Engineering Chemistry.
2. To give technical knowledge of several industries, where Engineering chemistry is used as an integral part, like: Polymer chemistry, Paints, Lubricants, Fuel, Glass etc.
3. To give knowledge of chemical aspect of water and its treatment.
4. To give knowledge of different type of corrossions and pollutions and there minimization.
5. To give brief knowledge of different advance techniques of Instrumental Chemistry, like Principal of spectroscopy, NMR and MRI spectroscopy. Elementary idea about organic reactions and synthesis of Drugs.

Q.No.	Questions	Marks	CO	BL	PI Code
<b>1</b>	<b>Answer any four parts of the following.</b>	<b>UNIT-I</b>			
a.	State de-Broglie hypothesis.	5	CO1	BL1	
b.	Derive Schrodinger equation for particle in one dimensional box.	5	CO1	BL3	
c.	On the basis of band theory, differentiate between insulator, conductor and semiconductor.	5	CO1	BL3	
d.	How crystal field theory applied in tetrahedral complexes?	5	CO1	BL2	
e.	What is meant by bond order? Calculate the bond order of $\text{He}_2^+$ , $\text{O}_2^-$ and $\text{O}_2^+$ molecules.	5	CO1	BL2	
<b>2</b>	<b>Answer any four parts of the following.</b>	<b>UNIT-II</b>			
a.	What is an electrochemical series? Discuss its three important applications.	5	CO1	BL1	
b.	Define and explain entropy. Write note on entropy change in reversible and irreversible processes.	5	CO1	BL2	
c.	Derive Nernst's equation for simple electrode potential and explain the terms involved in it.	5	CO1	BL3	

d.	What is the Hess Law.	5	CO1	BL2	
e.	What do you understand by Lewis theory of Acid and Bases.	5	CO1	BL2	
3	<b>Answer any two parts of the following.</b>	<b>UNIT-III</b>			
a.	Write short note on i. Reverse osmosis ii. Reactions involved in L-S Process iii. Prevention of Corrosion iv. Waterline Corrosion	10	CO3	BL1	
b.	Explain the Zeolite process for water softening and regeneration of Zeolite. What are the limitations of this process.	10	CO3	BL3	
c.	Define the Corrosion? Discuss the mechanism of Electro-chemical corrosion and Dry corrosion.	10	CO4	BL2	
4	<b>Answer any two parts of the following.</b>	<b>UNIT-IV</b>			
a.	Differentiate between thin film or thick film lubrication mechanism.	10	CO2	BL2	
b.	i. What are the limitations of raw rubber? Explain the process of vulcanization of rubber. ii. Write the method of preparation for the following polymers a. Nylon-6    b. Buna S c. Polyacrylonitrile                              d. PMMA	10	CO2	BL3	
c.	What is meant by calorific value of a fuel. What is the difference between gross calorific value and net calorific value. A coal has the following composition by weight C=90%, O=3.0%, S=0.5%, ash= 2.5% and N=0.5%. NCV of the coal was found to be 8490.5Kcal/Kg. Calculate the percentage of H and GCV of coal.	10	CO2	BL3	
5	<b>Answer any two parts of the following.</b>	<b>UNIT-V</b>			
a.	(i) Write note on the electronic transition caused by energy absorbed in the UV region. (ii) What do you understand by modes of vibration? Explain with suitable example.	10	CO5	BL2	
b.	i. Explain the stereochemistry of SN1 And SN2 reaction. ii. Synthesis of Aspirin.	10	CO5	BL3	
c.	Write Note On	10	CO5	BL3	

i. Application of NMR spectroscopy  
ii. Diels-Alder reaction

### Bloom's Levelwise Marks Distribution



■ BL1  
■ BL2  
■ BL3

### CO's Marks Distribution

