



VIT

Vellore Institute of Technology

SLOT: C2+TC2

REG.NO.:

SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST (CAT) -I
WINTER SEMESTER 2024-2025

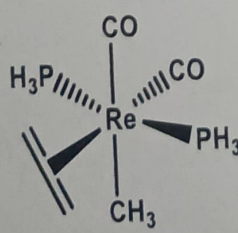
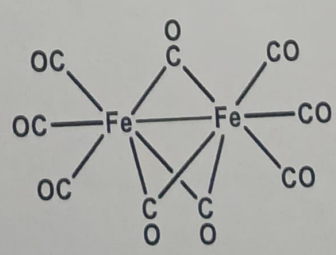
Course Code: BCHY101L Course Name: Engineering Chemistry
Faculty Name(s): Dr. BARNALI MAITI, Dr. BADAL KUMAR MANDAL, Dr. RAJAGOPAL D, Dr. MADHVESH PATHAK, Dr. SRIRAGHAVAN K, Dr. LOGANATHAN RANGASAMY, Dr. SHANMUGAM R

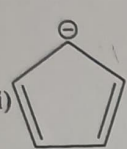
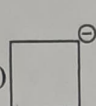
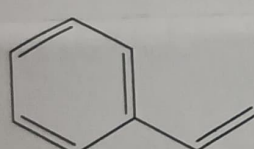
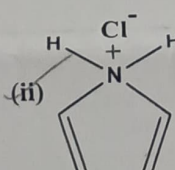
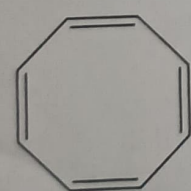
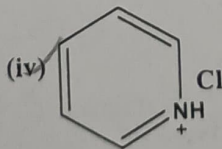
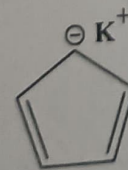
Class Number(s): VL2024250504281, VL2024250504283, VL2024250504284, VL2024250504287, VL2024250504289, VL2024250504292, VL2024250504293

Date of Examination: 29-Jan-2025 Exam Duration: 90 minutes Maximum Marks: 50

General Instruction(s):

- Answer **all** the Questions.
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes Statement:
CO. 1: Apply the fundamental concepts in organic, inorganic, and physical chemistry.

Q. No	Question	M	CO	BL
1.	Predict the shape and magnetic behavior of the following complexes based on the VBT method $[\text{Cu}(\text{NH}_3)_4]^{2+}$, $[\text{Ni}(\text{CN})_4]^{2-}$ and $[\text{Cu}(\text{Cl})_4]^{2-}$.	10	1	BL3
2.	a) Describe the two industrial applications for coordination complexes. b) Briefly explain the role of magnesium in chlorophyll.	5 + 5	1	BL3
3.	a) Examine the stability of the following complexes using the EAN rule. $[\text{Fe}(\text{Ar}) 3d^6 4s^2$, $\text{Re}(\text{Xe}) 4f^{14} 5d^5 6s^2]$ <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>(i)</p>  </div> <div style="text-align: center;"> <p>(ii)</p>  </div> </div>	5 + 5	1	BL3
	b) Discuss the application of organometallic compounds.			

4.	<p>a) Determine the increasing order of stability for the following carbocations and justify your answers.</p> <p>(i) $\text{CH}_3\text{CH}^+\text{CH}_2$, (ii) $\text{CH}_3\text{CH}^+\text{CH}_2$, (iii) $\text{CH}_3\text{CH}_2\text{CH}_2^+$, (iv) $\text{CH}_3\text{C}^+(\text{H})\text{CH}_3$</p> <p style="text-align: center;"> </p> <p>b) Determine the decreasing order of stability for the following carbanions and justify your answers.</p> <p>(i) CH_3^- (ii)  (iii)  (iv) $(\text{CH}_3)_2\text{C}^-$</p>	5 + 5	1	BL3
5.	<p>Identify the given organic compounds that are aromatic, anti-aromatic, and non-aromatic.</p> <p>(i)  (ii) </p> <p>(iii)  (iv) </p> <p>(v) </p>	10	1	BL3
