

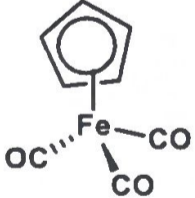
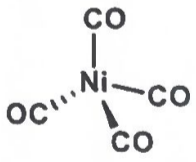


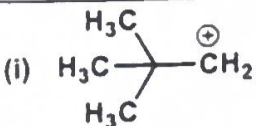
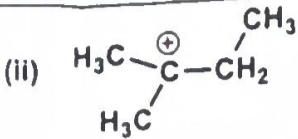

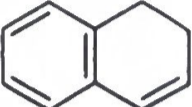

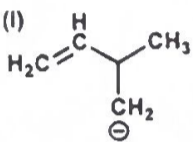
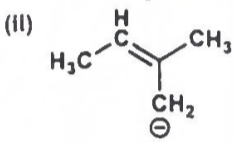

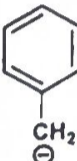
**SCHOOL OF ADVANCED SCIENCES  
CONTINUOUS ASSESSMENT TEST (CAT) -I  
WINTER SEMESTER 2024-2025**

**Programme Name & Branch** : BTech  
**Course Code** : BCHY101L  
**Course Name** : Engineering Chemistry  
**Faculty Name(s)** : Dr. Palanisami N, Dr. Karpagam S, Dr. Buvanewari G, Dr. Mausumi Goswami, Dr. Arunprasad M, Dr. Sovan Roy, Dr. Susanta Kumar Bhunia, Dr. Veera Venkata Ramesh E, Dr. Arup Sinha, Dr. Namrata Deka, Dr. Ramesh Kumar Singh  
**Class Number(s)** : VL2024250504297, VL2024250504298, VL2024250504299, VL2024250504305, VL2024250504307, VL2024250504308, VL2024250504309, VL2024250504311, VL2024250504313, VL2024250504316, VL2024250502595  
**Date of Examination** : 31<sup>st</sup> January 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 - Analyze, 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.	With the help of crystal field theory (CFT), explain why $[\text{CrF}_6]^{3-}$ is green but $[\text{Cr}(\text{CN})_6]^{3-}$ is yellow. Also calculate the CFSE values for $[\text{CrF}_6]^{3-}$ and $[\text{Cr}(\text{CN})_6]^{3-}$ .	10	1	BL3
2.	a) Explain any two applications of coordination compounds with suitable examples.  b) Predict the stability of the following metal complexes using the 18-electron rule- (i)  (ii) 	5 + 5	1	BL3
3.	a) Discuss the structure and any two applications of ferrocene.  b) Explain the importance of proximal and distal histidine present in hemoglobin during the process of oxygen binding.	5 + 5	1	BL3
4.	a) Predict the stability order of the following carbocations and give appropriate justification for your answer-	4 + 6	1	BL3

	<p>(i)  (ii) </p> <p>b) Classify the following organic molecules as aromatic / anti-aromatic / non-aromatic and give appropriate reasons for your answer-</p> <p>(i)  (ii)  (iii) </p>			
5.	<p>Predict the stability order of the following carbanions and give appropriate justification for your answer -</p> <p>(i)  (ii)  (iii)  (iv) </p>	10	1	BL3

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