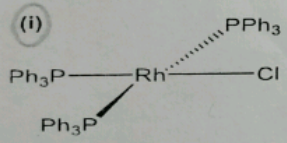
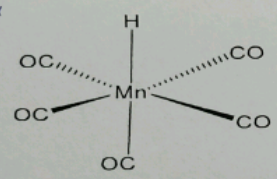
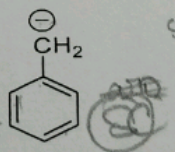
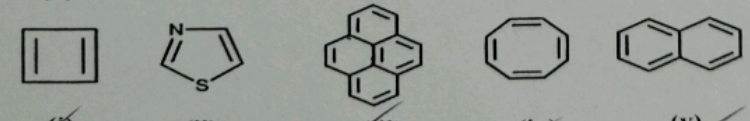
VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SCHOOL OF ADVANCED SCIENCES
Department of Chemistry
Winter Semester 2023-24
Continuous Assessment Test –I

Course Code: BCHY101L **Duration :** 90 Minutes **Slot:** E1+TE1
Course Name: Engineering Chemistry **Max. Marks :** 50
Class Numbers: VI2023240502637; 2638; 2640; 2641;2646; 2649 **Faculty Names:**
Dr.Buvaneswari G; Dr.Nawaz Khan F; Dr. Rajagopal D; Dr.Sasikumar S; Dr.Napoleon A.A; Dr.Madhvesh Pathak

Q N	Answer ALL the questions (5 x 10 = 50 Marks)	Marks	CO	BL
1	Comment on the hybridisation, magnetic character, geometry and calculate the magnetic moment for the complexes with a suitable diagram. i) $[Fe(CN)_6]^{4-}$ ii) $[CuCl_4]^{2-}$	10	CO1	BL1
2	**(a)** Determine the CFSE value for the following complexes i) $[Cr(CN)_6]^{3-}$ ii) $[CoF_6]^{3-}$ **(b)** Describe the structural features of Hemoglobin and give the role of proximal and distal histidine with illustration.	(5 + 5)	CO1	BL3
3	**(a)** Predict the stability of the following organometallic compound using 18-electron rule. (i)  (ii)  **(b)** Give the method of preparation of an antipyretic drug paracetamol and explain the role of acetic anhydride with necessary steps involved.	(5 + 5)	CO1	BL3
4	**(a)** Explain the stability of primary, secondary and tertiary carbocations using hyperconjugation and inductive effect with suitable examples. **(b)** Write down the stability order for following four different carbanions and justify your answer. (i) $R_3C-\overset{\ominus}{C}H_2$ (ii) $R_2C=\overset{\ominus}{C}H$ (iii) $RC\equiv C^{\ominus}$ (iv) 	(5 + 5)	CO1	BL3
5	Identify the following compounds as aromatic, antiaromatic, nonaromatic and justify your answer.  (i) (ii) (iii) (iv) (v)	10	CO1	BL2