



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

Course Code: BCHY101L

Duration : 90 Minutes

Slot: B1+TB1

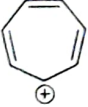


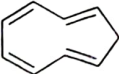
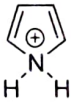
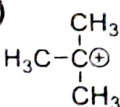
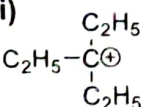
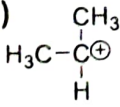
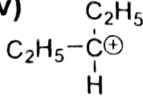
Course Name: Engineering Chemistry

Max. Marks: 50

Class Numbers: VI2023240502624; 2626; 2628; 2630; 2653; 2655; 2657

Faculty Names: Dr. Mohana Roopan S; Dr. Madhumitha G; Dr. Priyankar Paira; Dr. Sushma Kumari; Dr.

Veera Venkata Ramesh E; Dr. Susanta Kumar; Dr. Mausumi Goswami

Q N	Answer <u>ALL</u> the questions (5 x 10 = 50 Marks)	Marks	CO	BL
1	Elaborate on the structure, properties and function of a plant pigment which assists the conversion of light energy into chemical energy.	10	CO1	BL1
2	(a) Assign the configuration as $t_{2g}^m e_g^n$ for the following complexes. (i) $[\text{Fe}(\text{CN})_6]^{4-}$ (ii) $[\text{Cr}(\text{OH})_6]^{4-}$ (iii) $[\text{CoF}_6]^{4-}$ (iv) $[\text{Mn}(\text{NH}_3)_6]^{2+}$ (Here, NH_3 is a weak field ligand) and (v) $[\text{Co}(\text{NH}_3)_6]^{3+}$ (Here, NH_3 is a strong field ligand) (b) Predict the number of unpaired electrons and calculate crystal field stabilization energy (CFSE) for the above complexes.	(5 + 5)	CO1	BL3
3	(a) Calculate effective atomic number (EAN) for the following compounds. Also identify the compound(s) which does not obey 18-electron rule and predict their stability. (i) $[(\eta^6\text{-C}_6\text{H}_6)_2\text{Cr}]$ (ii) $[\text{HMn}(\text{CO})_5]$ (b) Propose the synthesis and mechanism for the acetylsalicylic acid.	(5 + 5)	CO1	BL3
4	(a) Identify the aromatic, non-aromatic and anti-aromatic compound(s) out of the following. i)  ii)  iii)  iv)  v)  (b) Write the synthesis of a dye which is used as an indicator in the neutralization of acid-base titrations.	(5 + 5)	CO1	BL3
5	Arrange the following carbocations in an increasing order of their stability. Justify with their appropriate hyperconjugate resonance structures for each structure. i)  ii)  iii)  iv) 	10	CO1	BL2