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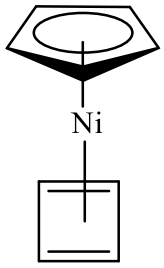
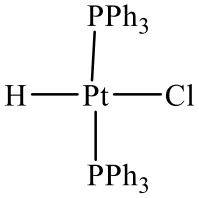
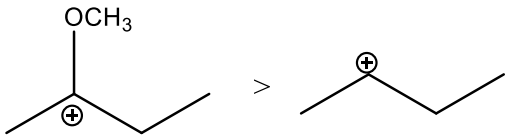
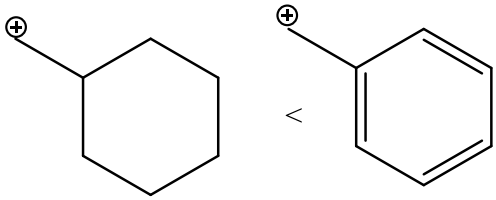
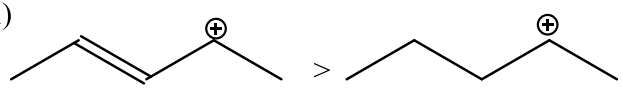
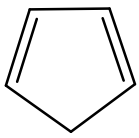
CONTINUOUS ASSESSMENT TEST – I

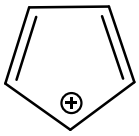
Programme Name & Branch : BTECH FRESHERS
Course Code : BCHY101L
Course Name : ENGINEERING CHEMISTRY
Slot : B2+TB2
Date of the Examination : 07. 11. 2022
Duration : 90 minutes **Max. Marks : 50**

Q. No.	Key **Answer ALL the questions** **(5 X 10 = 50 Marks)**	Marks	CO	BL
1	a) Verify whether ferrocene obeys the effective atomic number rule and mention any one of its applications. Ferrocene Fe^{2+}= $6e^-$ 2Cp= 12 e^- total 18 e^- 3 marks Ferrocene obeys the effective atomic number rule 1M Application 1 mark b). Comment on the stability of the following complexes. Justify your answer. i)  ii)  i) Ni+=9 e^- CP = 6 e^- η^4 - C_4H_4= 4 e^- 19 e^- s not stable ii) Pt^{2+} is **[Xe]$4f^{14}5d^8$** Pt^{2+} = 8 e^- pph_3= 4 e- H^- = 2 e- Cl^- = 2 e- 16 e^- not stable	**5+5**	1	BL1

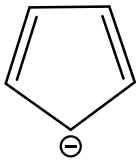
2	Compare the shape, hybridization and magnetic behaviour of the following coordination complexes. i) $[Ni(CN)_4]^{2-}$ and ii) $[NiCl_4]^{2-}$ Electronic configuration of Metal ion= 1M Electronic configuration of Metal ion with ligand Hybridization= 1M Shape = 1M Writing Hybridization= 1M Magnetic behaviour= 1M	**10**	1	BL3
3	Identify the more stable carbocation within the given pairs with appropriate reason. Illustrate how the steric effect increases the stability of tertiary carbocation with an example. i)  ii)  iii)  3X2M=6M Explanation on the steric effect = 4M	**10**	1	BL4
4	a) Give the synthetic route for Aspirin (Acetylsalicylic acid) and give its application. b) Explain the synthesis of an azo dye methyl orange with the reaction conditions and steps involved. Synthesis = 3M Applications=2M	**(5 + 5)**	1	BL1
5	a) Classify the following molecules as aromatic, anti aromatic or nonaromatic and justify your answer.	**(5 + 5)**	1	BL4



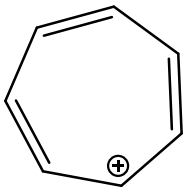
i
Non Aromatic



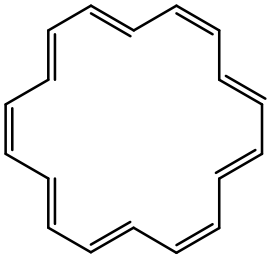
ii
Anti Aromatic



iii
Aromatic



iv
Aromatic



v
Aromatic

b) Write the reactions involved in photosynthesis both in presence and absence of light.

Light reaction

PS –II: $2H_2O \longrightarrow O_2 + 4H^+ + 4e$

PS – I: $2NADP^+ + 2H^+ + 4e \longrightarrow 2NADPH$

Dark reaction

$6CO_2 + 12NADPH + 12\ H^+ \longrightarrow 12\ NADP^+ + 6H_2O + C_6H_{12}O_6$