LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

SECOND SEMESTER – **APRIL 2025**

UCH2MC01 – HYDROCARBONS AND STEREOCHEMISTRY

Date: 25-04-2025 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 PM

		SECTION A - K1 & K2 (CO1)
Q.No	Levels	**Answer ALL the Questions** **(10 x 2 = 20)**
1	K1	What is stabilization energy?
2		Give the reaction mechanism for the following reaction. $CH_2=CH_2 + H_2SO_4 \rightarrow$?
3		How will you prepare 1-propyne by dehydrohalogenation?
4		What is aromaticity? Give an example.
5		Define the term conformation.
6	K2	Define electromeric effect.
7		What is Wurtz reaction?
8		Show the reaction of ozonolysis of alkene.
9		Draw the structure of naphthalene and anthracene.
10		Define flagpole hydrogen with an example.
		SECTION B – K3 & K4 (CO2)
		Answer ALL the Questions **(4 x 10 = 40)**
11	K3	What is tautomerism? Explain the mechanism of *keto-enol* tautomerism and apply it to ethyl acetoacetate as an example.
		[OR]
12		Describe the stability of primary, secondary and tertiary carbocations based on hyper-conjugation effect.
13		Describe in detail about Baeyer's strain theory and theory of strain-less rings.
		[OR]
14		a) Illustrate Markownikoff's rule with suitable example. [5+5] b) Predict the product of the following on reaction with $CH_2=CH-CH=CH_2$. (i) HCl (ii) Br_2 (iii) Hydrogen/Pt
15	K4	How will you prepare benzene by industrial and laboratory methods?
		[OR]
16		Discuss the conformational analysis of ethane.
17		Assign E, Z configuration for the following geometric isomers. (i) 1-Bromo-1-chloropropene (ii) 1-Chloro-1-ethyl-2-methylethene (iii)1-Bromo-1-chloro-2-iodopropene
		[OR]
18		a) What do you know about Corey-House synthesis of alkanes and its mechanism? [5+5] b) Explain the following with suitable reasons. (i) Formic acid is a stronger acid than chloroacetic acid. (ii) Fluoroacetic acid is a stronger acid than chloroacetic acid.

SECTION C – K5 & K6 (CO3)		
	Answer ALL the Questions	**(2 x 20 = 40)**
19	K5	a) Discuss about the term inductive effect and resonance effect. Mention any three applications of each. b) Describe the mechanism of halogenation of methane and give two evidences in support of mechanism. (10+10)
		[OR]
20		a) How are alkenes prepared from alkyl halides, and alcohols? Give mechanisms. b) "Acetylene is a stronger acid than ammonia, but weaker acid than water"-Explain this statement. c) Write a note on "peroxide effect". (10+5+5)
21	K6	a) Elaborate the mechanism of nitration and sulphonation of benzene. [10+10] b) What is recemization? Describe any two methods of resolving racemic mixture.
		[OR]
22		a) Discuss conformational analysis of cyclohexane. [10+4+6] b) Predict the product for the following reactions. (i)  $+ CH_3Cl / AlCl_3 \longrightarrow ?$ (ii)  $+ 3Cl_2 \longrightarrow ?$ c) Apply the Cahn-Ingold-Prelog sequence rule and designate R,S-configuration to the following. (i) (ii) (iii)