TOTAL PAGES: 2

25CHP101

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2025
(First Semester)

Branch - **CHEMISTRY**

ORGANIC REACTION MECHANISM AND STEREOCHEMISTRY

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Inductive effect is caused by? (a) Electron displacement (b) Resonance (c) Hyperconjugation (d) None	K1	CO1
	2	Hammett equation is related to? (a) Acid strength (b) Basicity (c) Reaction mechanism (d) Stereochemistry	K2	CO1
2	3	Which ion is aromatic? (a) Cyclopropenium cation (b) Cyclobutadiene (c) Cyclooctatetraene (d) None	K1	CO2
	4	Which diagram is used to study aromaticity? (a) Frost (b) Molecular Orbital (c) Energy band (d) None	K2	CO2
3	5	SE1 reaction occurs in? (a) Aliphatic compounds (b) Aromatic compounds (c) Both (d) None	K1	CO3
	6	Friedel-Crafts acylation requires? (a) AlCl3 (b) ZnCl2 (c) FeCl3 (d) H2SO4	K2	CO3
4	7	Pinacol-pinacolone rearrangement involves? (a) Carbocation shift (b) Carbanion shift (c) Free radical (d) None	K1	CO4
	8	Baeyer-Villiger oxidation gives? (a) Ester (b) Alcohol (c) Aldehyde (d) Ketone	K2	CO4
5	9	Diastereomers differ in? (a) Configuration (b) Bond length (c) Hybridisation (d) None	K1	CO5
	10	E-Z isomerism is shown by? (a) Alkenes (b) Alkanes (c) Alkynes (d) Aromatics	K2	CO5

SECTION - B (35 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the inductive and field effects with suitable examples. How do they influence acidity and basicity?	K4	CO1
		(OR)		
	11.b.	Explain the Hammett equation and its significance in studying reaction mechanisms.	K5	

Cont...

2	12.a.	Explain Hückel's rule with examples.	K3	CO2
		(OR)		
	12.b.	Describe the application of Frost-Musulin diagram in determining aromaticity.	K5	
3	13.a.	Describe the mechanism of nitration of benzene with equations.	K3	CO3
		(OR)		
	13.b.	Discuss Kolbe–Schmidt reaction with mechanism.	K4	
4	14.a.	Explain the mechanism of Beckmann rearrangement.	K4	CO4
		(OR)		
	14.b.	Write the mechanism of Baeyer–Villiger oxidation.	K3	
5	15.a.	Explain R–S system of nomenclature with examples.	K3	CO5
		(OR)		
	15.b.	Explain geometrical isomerism in oximes.	K3	

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Discuss the methods of determining organic reaction mechanisms with examples.	K5	CO1
2	17	Explain the aromatic character of non-benzenoid systems with examples.	K5	CO2
3	18	Describe the general mechanism, orientation, and reactivity in aromatic electrophilic substitution reactions.	K5	CO3
4	19	Discuss the mechanism of Hofmann and Curtius rearrangements. Compare their similarities.	K5	CO4
5	20	Discuss the methods used for asymmetric synthesis with examples.	K6	CO5

Z-Z-Z END