

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	Hyperconjugation is also called (a) No bond resonance (b) Inductive effect (c) Hydrogen bonding (d) None	K1	CO1
	2	Taft equation is used for (a) Polar effects (b) Steric effects (c) Aromaticity (d) None	K2	CO1
2	3	Which is non-aromatic? (a) Benzene (b) Cyclooctatetraene (c) Ferrocene (d) Azulene	K1	CO2
	4	Which follows Huckel's rule? (a) $4n+2$ π electrons (b) $4n$ π electrons (c) $2n$ π electrons (d) None	K2	CO2
3	5	Stork enamine reaction is an example of (a) Electrophilic substitution (b) Nucleophilic substitution (c) Elimination (d) None	K1	CO3
	6	Which is not electrophilic substitution? (a) Nitration (b) Halogenation (c) Hydroboration (d) Sulphonation	K2	CO3
4	7	Beckmann rearrangement converts oximes to (a) Amides (b) Esters (c) Alcohols (d) None	K1	CO4
	8	Wolff rearrangement involves (a) Ketones (b) Amides (c) Diazoketones (d) None	K2	CO4
5	9	Number of stereoisomers of 2,3-dibromobutane is (a) 3 (b) 4 (c) 2 (d) None	K1	CO5
	10	R-S nomenclature is based on (a) CIP rules (b) Resonance (c) Hyperconjugation (d) None	K2	CO5

Cont...

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.	Discuss the concept of hyperconjugation using propene as an example.	K2	CO1
	(OR)			
	11.b.	Describe the primary and secondary kinetic isotope effects with examples.		
2	12.a.	Compare aromatic, anti-aromatic, and non-aromatic compounds with examples.	K3	CO2
	(OR)			
	12.b.	Discuss the aromaticity of ferrocene and cyclopropenium cation.		
3	13.a.	Explain the Friedel–Crafts acylation reaction.	K3	CO3
	(OR)			
	13.b.	Explain the Gattermann–Koch reaction.		
4	14.a.	Discuss the Pinacol–pinacolone rearrangement.	K4	CO4
	(OR)			
	14.b.	Explain the Wagner–Meerwein rearrangement with example.		
5	15.a.	Describe the conformational analysis of cyclohexane.	K4	CO5
	(OR)			
	15.b.	Discuss optical isomerism in biphenyl compounds.		

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	Illustrate the concept of resonance and hyperconjugation in stabilizing organic intermediates.	K5	CO1
2	17	Discuss the role of NMR in determining aromaticity.	K4	CO2
3	18	Write short notes on carbenes – structure, generation, and reactions.	K3	CO3
4	19	Explain the mechanisms of Fries and Benzidine rearrangements.	K4	CO4
5	20	Explain conformational effects on reactivity in cyclohexane derivatives with suitable reactions.	K5	CO5

Z-Z-Z END