

MSc DEGREE EXAMINATION MAY 2026
(Third Semester)

Branch- **CHEMISTRY**

PHOTOCHEMISTRY, PERICYCLIC REACTIONS AND NATURAL PRODUCTS

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	1. The Barton reaction is an example of _____ a) Photoreduction b) Pericyclic rearrangement c) Radical nitrite photolysis d) Photocycloaddition	K1	CO1
	2	The di- π -methane rearrangement involves excitation of a molecule containing _____ a) One π -bond b) Two π -bonds separated by a methylene group c) A carbonyl group d) An aromatic ring only	K2	CO1
2	3	Diels–Alder reaction is an example of _____ a) Electrocyclic reaction b) Cycloaddition reaction c) Sigmatropic rearrangement d) Radical substitution	K1	CO2
	4	According to Woodward–Hoffmann rules, a thermal 4π electron electrocyclic reaction proceeds by _____ a) Conrotatory motion b) Disrotatory motion c) Sigmatropic shift d) Radical mechanism	K2	CO2
3	5	Morphine is obtained from _____ a) Tea leaves b) Ginger rhizome c) Cinchona bark d) Opium poppy	K1	CO3
	6	Cellulose is a polymer of _____ a) α -D-glucose b) β -D-glucose c) Fructose d) Galactose	K2	CO3
4	7	Hetero atoms present in Thiazole is _____ a) N,N b) N,O c) N,S d) S,S	K1	CO4
	8	The bright color of cyanin chloride is due to _____ a) Presence of conjugated π -system b) Presence of nitrogen atom c) Carbohydrate moiety d) Oxidized sulfur groups	K2	CO4
5	9	Basic nucleus of Cholesterol is _____ a) Cholestane b) Cyclopentanoperhydrophenanthrene c) Androstan d) Ergostane	K1	CO5
	10	Chloramphenicol inhibits _____ in bacteria. a) DNA replication b) RNA synthesis c) Protein synthesis at ribosomal subunit d) Cell wall formation	K2	CO5

Cont...

ALL questions carry EQUAL Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Compare the reactivity of cyclic ketones and α,β -unsaturated ketones under UV light.	K5	CO1
		(OR)		
	11.b.	Explain photoreduction and photocycloaddition reactions of carbonyl compounds with suitable mechanisms		
2	12.a.	Elaborate orbital correlation diagram method for electrocyclic reactions.	K6	CO2
		(OR)		
	12.b.	Adapt Claisen rearrangement as a tool for C–C bond formation.		
3	13.a.	Analyze the structure of Reserpine with appropriate proof.	K4	CO3
		(OR)		
	13.b.	Analyse the structure of Zingiberene in detail.		
4	14.a.	Compare and contrast the reactivity of oxazole and pyrazole and mention any two applications of each.	K4	CO4
		(OR)		
	14.b.	Examine the chemistry of luteoline and Kaemferol		
5	15.a.	Explain the classification, conformation aspects of A/B cis and A/B trans steroids.	K5	CO5
		(OR)		
	15.b.	Judge the chemistry of male and female sex hormones and their importance.		

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	(i) Contrast Norrish Type I and Norrish Type II reactions with mechanisms. ii) Analyze the Jablonski diagram in detail.	K4	CO1
2	17	Discuss (i) Electrocyclic reaction of 1,3,5 trienes (ii) [2+2] cycloaddition of alkenes.	K6	CO2
3	18	Conclude the structure of Thiamine and Starch by appropriate chemical reactions.	K5	CO3
4	19	Explain the structure and synthesis of Flavones and Isoflavones.	K5	CO4
5	20	Justify the structure of penicillin by stepwise structural elucidation and explain its mode of action.	K4	CO5

Z-Z-Z END