

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
MSc DEGREE EXAMINATION MAY 2022
(Second Semester)

Branch – CHEMISTRY

ORGANIC CHEMISTRY-II

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (5 x 1 = 5)

1. The carbene which adds stereo specifically to a double bond is in the ----- state.
(a) Singlet (b) Triplet
(c) Doublet (d) Free radical
2. Oppenauer oxidation is the reverse process of
(a) Wolff-Kishner reduction (b) Rosemund reduction
(c) Clemmensen reduction (d) MPV reduction
3. Hydroboration follows
(a) Regioselectivity (b) Markownikoff's rule
(c) Anti-Markownikoff's rule (d) Regioselectivity and anti-Markownikoff's rule
4. 1,3-dithiane is an example of
(a) Synthone (b) Synthetic equivalent
(c) Umpolung (d) Target unit
5. Which reagent will yield cis-1,2-cyclopentanediol from cyclopentene?
(a) OsO₄ (b) HIO₄
(c) DCC (d) DDQ

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 3 = 15)

6. (a) Chlorobenzene is far less reactive than aniline in electrophilic substitution although chlorine and nitrogen have almost the same electronegativity. Explain.
(OR)
(b) Why CHCl₃ is more reactive than CHF₃ in S_E¹ reaction? Explain.
7. (a) Distinguish between Hofmann and Saytzeff's eliminations.
(OR)
(b) Compare E₁ and E₁CB reactions.
8. (a) What is Mannich reaction? Explain its mechanism.
(OR)
(b) What is Wittig reaction? Explain its synthetic application with examples.
9. (a) What are synthetic equivalents? How do they differ from synthone? Mention the synthetic importance of both of them.
(OR)
(b) List out the importance of order of events.

Cont...

10. (a) What is Wilkinson's catalyst? Explain its synthetic applications and advantages.

(OR)

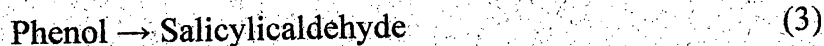
(b) What are crown ethers? Why are they so called? Mention its characteristics and synthetic applications

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 6 = 30)

11. (a) (i) How would you effect the following transformation? Explain its mechanism.



(ii) Distinguish between SE^1 and SE^2 reactions. (3)

(OR)

(b) (i) What are carbenes? How are they generated? Explain its synthetic applications with examples. (3)

(ii) What is Kolbe's reaction? Give its mechanism. (3)

12. (a) (i) What are the conditions that favour E_1CB mechanism in an elimination reaction? Illustrate with an example. (3)

(ii) List any three synthetic utilities of SeO_2 . (3)

(OR)

(b) (i) In E_2 reaction a threo form gives trans-alkene while an erythro form gives a cis-olefin. Comment with suitable reasons. (3)

(ii) State and explain Bredt's rule. (3)

13. (a) (i) Predict a method for the preparation of crotonaldehyde from acetaldehyde and also suggest its mechanism. (3)

(ii) What is benzoin condensation? Explain its mechanism. (3)

(OR)

(b) (i) How would you prepare cinnamic acid from benzaldehyde? Identify this name reaction. Give its mechanistic pathways. (3)

(ii) What is Stobbe condensation? Explain its synthetic utilities. (3)

14. (a) Write any two functional group interconversions involving $-CHO$, $-C=O$, $-COOH$ and alkene from n-butane.

(OR)

(b) (i) Differentiate between chemo-selectivity, regio-selectivity and stereo-selectivity. (3)

(ii) Name the protecting group for $-CHO$, $-OH$ and $-NH_2$ groups. (3)

15. (a) Pick out the suitable reagent(s) for the following transformations:

(i) Cyclohexene \rightarrow Hexanediol (Ozone) (2)

(ii) Iodobenzene \rightarrow Toluene (Gilman's Reagent) (2)

(iii) Butyl bromide \rightarrow n-Butane (LAH) (2)

(OR)

(b) Identify the suitable reagent(s) for the following transformations:

(i) β - Hydroxy ester \rightarrow α,β -Unsaturated ester (DCC) (2)

(ii) Tetralin \rightarrow Naphthalene (DDQ) (2)

(iii) Acetamide \rightarrow Ethylamine (LAH) (2)