

MODEL PAPER
SECOND YEAR B.Sc., DEGREE EXAMINATION
SEMESTER-III
CHEMISTRY COURSE-III: ORGANIC CHEMISTRY &
SPECTROSCOPY

Time: 3 hours

Maximum Marks: 75

PART- A

5 X 5 = 25 Marks

Answer any **FIVE** of the following questions. Each carries **FIVE** marks

1. Discuss two methods for preparation of aryl halides.
2. Explain the mechanism for Pinacol-Pinacolone rearrangement.
3. Discuss the mechanism for Bayer-villiger oxidation reaction.
4. Explain the effect of substituents on acidic strength of mono-carboxylic acids.
5. Write the mechanism for Claisen Condensation reaction.
6. Write the selection rules in rotational spectroscopy.
7. Explain Spin – Spin coupling and Coupling Constant.
8. Explain types of electronic transitions in UV spectroscopy.

PART- B (Organic Chemistry)

3 X 10 = 30 Marks

Answer **any three** of the following questions. Each carries **TEN** marks

9. Give the mechanism & stereochemistry of SN^1 & SN^2 reactions of alkyl halides with suitable example.
10. Explain the following reactions with mechanism.
(i) Reimer-Tiemann reaction (ii) Fries rearrangement.
11. Discuss the mechanism for following reactions.
(i) Perkin reaction. (ii) Cannizaro reaction
12. Write the preparation and any three synthetic applications of diethyl malonate.
13. Explain acid and base hydrolysis reaction of esters with mechanism.
14. Explain the mechanisms of Curtius rearrangement & Arndt –Eistert reaction.

PART- C (Spectroscopy)

2 X 10 = 20 Marks

Answer **any two** of the following questions. Each carries **TEN** marks

15. (i) Write a note on vibrational degrees of freedom for polyatomic molecules.
(ii) Explain different modes of vibrations & selection rules in IR spectroscopy.
16. (i) Define Bathochromic shift. Explain the effect of conjugation in U.V. spectroscopy.
(ii) Discuss the principle of NMR spectroscopy.
17. Write Woodward-Fieser rules for calculating λ_{max} for conjugated dienes and α, β – unsaturated carbonyl compounds, and apply them for one example each.
18. What is Fingerprint region. Explain its significance with an example. (ii) Write IR spectral data for any one alcohol, aldehyde and ketone