

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

Time: 3 hours

Maximum Marks: 75

**PART- A**  
Marks

5 X 5 = 25

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**  
Marks

5 X 10 = 50

Answer **ALL** the questions. Each carries **TEN** marks

- 9 (a). Give the mechanism & stereochemistry of  $SN^1$  &  $SN^2$  reactions of alkyl halides with suitable example.  
(or)

- (b). Explain the following reactions with mechanism.  
(i) Reimer-Tiemann reaction (ii) Fries rearrangement.

- 10 (a). Discuss the mechanism for following reactions.  
(i) Perkin reaction. (ii) Cannizaro reaction

(or)

- (b). Write the preparation and any three synthetic applications of diethyl malonate.

- 11.(a). Explain acid and base hydrolysis reaction of esters with mechanism.  
(or)

- (b). Explain the mechanisms of Curtius rearrangement & Arndt – Eistert reaction.
- 12.(a). (i) Write a note on vibrational degrees of freedom for polyatomic molecules.
- (ii) Explain different modes of vibrations & selection rules in IR spectroscopy.
- (or)
- (b).(i) Define Bathochromic shift. Explain the effect of conjugation in U.V. spectroscopy.
- (ii) Discuss the principle of NMR spectroscopy.
- 13.(a). Write Woodward-Fieser rules for calculating  $\lambda_{\text{max}}$  for conjugated dienes and  $\alpha,\beta$  – unsaturated carbonyl compounds , and apply them for one example each.
- (or)
- (b).(i) What is Fingerprint region. Explain its significance with an example.(ii) Write IR spectral data for any one alcohol, aldehyde and ketone