

10. (a) Draw the correlation and FMO diagram for  $4\pi + 2\pi$  cycloaddition reaction. Explain.

Or

- (b) Discuss the following rearrangement.
- Sigmatropic.
  - Claisen. (5 + 5)

S.No. 349

12PCHZ04

(For the candidates admitted from 2012–2013 onwards)

M.Sc. DEGREE EXAMINATION, APRIL/MAY 2018.

Fourth Semester

Chemistry

ORGANIC SPECTRA, PHOTO CHEMISTRY AND  
PERICYCLIC REACTIONS

Time : Three hours Maximum : 75 marks

PART A — (5 × 5 = 25 marks)

Answer ALL the questions.

1. (a) Describe the Woodward-Filser rules for calculating the  $\lambda_{\max}$  value in enones.

Or

- (b) What are the factors affecting the vibrational frequencies in IR spectra? Explain.

2. (a) Explain axial haloketone rule.

Or

- (b) Describe McLafferty rearrangement.

3. (a) Explain the principles of NMR spectroscopy.

Or

(b) Write the applications of ESR spectroscopy.

4. (a) Draw and explain the Jablonski diagram.

Or

(b) Explain Paterno-Buchi reaction.

5. (a) Give an account on Woodward-Hofmann rule.

Or

(b) Explain Cope rearrangement.

PART B — (5 × 10 = 50 marks)

Answer ALL questions.

6. (a) Discuss about the chromophores effect of conjugation and substitutions with unshared electrons on  $\lambda_{\max}$  values for organic molecules.

Or

(b) (i) Differentiate inter and intra molecular hydrogen bonding using IR spectra. (5)

(ii) Write notes on Fermi resonance. (5)

7. (a) Explain :

(i) Metastable ion peak. (3)

(ii) Nitrogen rule. (4)

(iii) Base peak. (3)

Or

(b) Explain octant rule for ketones and + and - cotton effect curves.

8. (a) Explain the various factors affecting chemical shift value.

Or

(b) Write notes on :

(i) Zero field splitting (5)

(ii) 'g' value. (5)

9. (a) Explain Norrish type I and II reactions.

Or

(b) Describe the following :

(i) Photo-fries rearrangement.

(ii) Photo oxidation. (5 + 5)