

**Dr.B.R.AMBEDKAR OPEN UNIVERSITY**  
**FACULTY OF SCIENCE**  
**M.Sc. II year -CHEMISTRY (2025-26)**  
**Course – 5: ORGANIC REACTION MECHANISM-II, PERICYCLIC REACTIONS,**  
**ORGANIC PHOTOCHEMISTRY, STEREO CHEMISTRY-II**

**ASSIGNMENT - I**

**[ 3X5=15]**

Maximum Marks – 15

Minimum Marks – 06

***Instructions to the candidates:***

- i) Answer all Questions
  - ii) Each question carries 5 marks.
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1. a. Discuss the stability and formation of carbonium ions, carbanion, carbene and nitrene.  
b. Explain the Mechanism, stereochemistry and orientation of E<sub>1</sub>, E<sub>2</sub> and E<sub>1</sub>CB reactions.  
c. Bayer-Villiger oxidation.  
d. Hoffman. Lossen, Curtius rearrangements
  2. a. What are pericyclic reactions? Classify them with suitable examples.  
b. Give orbital symmetry correlation diagram for 4n+2 Electrocyclization and  $\pi^2+\pi^2$  cycloaddition reaction.
  3. a. Draw the  $\pi$ -molecular orbitals for the 1,3,5-hexatriene.  
b. Predict the reaction conditions for  $[\pi^4+\pi^2]$  cycloaddition by FMO method.

**ASSIGNMENT - II**

**[ 3X5=15]**

Maximum Marks – 15

Minimum Marks – 06

***Instructions to the candidates:***

- i) Answer all Questions
  - ii) Each question carries 5 marks.
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1. Write short note on:
    - a. Norrish cleavages.
    - b. Paterno-Buchi reaction.
    - c. Di- $\pi$ -methane rearrangement.
    - d. Photo Isomerisation of benzene & photo substitution reactions of benzene.
    - e. Fluorescence.
    - f. Barton reaction
  2. Discuss the conformations of Meso-butane 2,3-diol, 2L,3D-butane-2,3-diol, Cyclohexane cyclohexanone, quinolizidine, and decalins .
  3. Write short note on:
    - a) Pitzer strain.
    - b) 2-alkyl and 3- alkyl ketone effect.
    - c) Curtian-Hammett principle

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**COURSE – 6 : SYNTHETIC ORGANIC CHEMISTRY**

**ASSIGNMENT - I**

**[ 3X5=15]**

Maximum Marks – 15

Minimum Marks – 06

***Instructions to the candidates:***

- i) Answer all Questions
  - ii) Each question carries 5 marks.
1. Write short notes on:
    - a) Oppenauer Oxidation
    - b) Oxidation with DDQ and AgCO<sub>3</sub>.
    - c) Reduction with LiAlH<sub>4</sub>, NaBH<sub>4</sub>, DIBAL.
    - d) Clemmensen reduction and Bouveault-Blanc reduction.
  2. Write a short note on:
    - a. Michael addition.
    - c. Wittig reaction
    - d. Shapiro reaction
    - e. Give protection and deprotection of alcohols, ketones and amines.
  3. What is oxidation? Explain different types of oxidations using at least one example.

**ASSIGNMENT - II**

**[ 3X5=15]**

Maximum Marks – 15

Minimum Marks – 06

***Instructions to the candidates:***

- i) Answer all Questions
  - ii) Each question carries 5 marks.
1. Discuss the following.
    - a. One group C-X Disconnection
    - b. Two group C-X Disconnection.
  2. a. Explain the following with suitable examples. i. Homotopic units, ii. Heterotopic Units, iii. Homomeric ligands, iv. Homomeric faces.  
b. Write a note on Felkin-Anh model, ii. Cram's dipolar model.
  3. Write the retrosynthetic analysis and synthesis of Disparlure and Z-Jasmone.  
Write a note on i. Enantioselective differentiation reactions, ii. Enantio face differentiation reactions.

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**COURSE – 7 : NATURAL PRODUCTS, HETEROCYCLES, BIOGENESIS AND**  
**SPECTROSCOPY**

**ASSIGNMENT - I**

**[ 3X5=15]**

Maximum Marks – 15

Minimum Marks – 06

***Instructions to the candidates:***

- i) Answer all Questions
  - ii) Each question carries 5 marks.
1. Write a short note on structure determination of Reserpine and give the synthesis of morphine. Discuss the structure elucidation of PGE<sub>1</sub>α, PGE<sub>2</sub>α, PGE<sub>3</sub>α.
  2. Write a note on a. Enzyme inhibition. b. factors effecting the enzymatic catalysis. C. Feeding experiments, d. biosynthesis of aromatic compounds by Shikimic acid pathway.
  3. What is Lipogenesis? Write down the steps involved in fatty acid metabolism and discuss about the biosynthesis of terpenoids by Mevalonate path way..

**ASSIGNMENT - II**

**[ 3X5=15]**

Maximum Marks – 15

Minimum Marks – 06

***Instructions to the candidates:***

- i) Answer all Questions
  - ii) Each question carries 5 marks.
1. Discuss any two methods of synthesis and chemical reactions of isoxazole, imidazole, triazole, tetrazole, pyrimidine and aziridines.
  2. Discuss the following.
    - a. Couplings in <sup>13</sup>C NMR spectroscopy.
    - b. Applications of <sup>31</sup>P NMR.
    - c. <sup>13</sup>C NMR spectra editing techniques.
  3. Write a note on type of <sup>13</sup>C NMR spectra and how the <sup>13</sup>C NMR recorded

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**COURSE – 8 : DRUGS & PHARMACEUTICALS**

**ASSIGNMENT - I**

**[ 3X5=15]**

Maximum Marks – 15

Minimum Marks – 06

***Instructions to the candidates:***

- i) Answer all Questions
  - ii) Each question carries 5 marks.
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1. a. Explain the strategies involved in the lead modification from the synthesis of analogues.  
Discuss the SAR studies of Sulphonamides.
  2. What is lead and lead discovery? Explain the drug discovery with lead.
  3. a. What is Prodrug? Explain the principles of prodrug design.  
b. Write a short note on Broad spectrum antibiotics.

**ASSIGNMENT - II**

**[ 3X5=15]**

Maximum Marks – 15

Minimum Marks – 06

***Instructions to the candidates:***

- i) Answer all Questions
  - ii) Each question carries 5 marks.
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1. a. What are Cholinergic agonist and antagonists? Explain anti cholinesterases.  
b. Write a note on Histamine receptor antagonists.
  2. What are ion channels? Discuss about the drugs acting on Sodium ion channels and Calcium ion Channels
  3. Explain the following.
    - a. DNA Polymerase inhibitors
    - b. Pfeiffer's rule
    - c. Quality control methods in Drug analysis.