

**Dr.B.R.AMBEDKAR OPEN UNIVERSITY**  
**FACULTY OF SCIENCE**  
**M.Sc. – II year -CHEMISTRY (2020-21)**  
**Course – 5 : ORGANIC REACTION MECHANISM-II, PERICYCLIC REACTIONS,**  
**ORGANIC PHOTOCHEMISTRY, STEREO CHEMISTRY-II**

**FIRST ASSIGNMENT**

Maximum Marks – 15  
Minimum Marks - 06

**Section – A [1X10=10]**  
(Essay Type)

Answer any *one* question from the following Two questions

1. Formulate the mechanism of the following reactions
  - a. Michael addition.
  - b. Pinacol-Pinacolone rearrangement..
  - c. Favorskii rearrangement.
  - d. Hofmann rearrangement.
  - e. Pyrolytic elimination.
2. a. Explain various type of cycloaddition reactions and their feasibility by FMO method.  
b. Give orbital symmetry correlation diagram for  $4n+2$  Electro cyclisation reactions.

**Section –B [1X5=5]**  
(Short Type)

Answer any *one* question from the following Two questions

1. Discuss about Mechanism of E1, E2 and E1CB reactions.
2. a. Draw the  $\pi$ -molecular orbitals of 1,3 - butadiene and 1,3,5-hexatriene.  
b. Write a note on the various stereo chemical modes of sigmatropic reactions.

**SECOND ASSIGNMENT**

Maximum Marks – 15  
Minimum Marks – 06

**Section – A**  
(Essay Type) – [1X10=10]

(Answer any One question from the following Two questions)

1. a. Discuss about Jablonski diagram.  
b. Give the mechanism for the Norish-I, Norish-II, Photo Fries rearrangement and paterno-buchi reactions, Barton reaction and Di- $\pi$ -methane rearrangement reaction.
2. Discuss the conformations of substituted cyclohexane, quinolizidine, and decalins .

**Section –B**  
(Short Type) -- 1X5=5

(Answer any one question from the following Two questions)

1. Explain the following.
  - a. Photochemistry of olefins:
  - b. Photochemistry of benzene.
2. Write a note on conformational analysis of the following molecules?:
  - a) Meso-butane 2,3-diol.
  - b) 2L,3D-butane-2,3-diol.
  - c) Cyclohexene

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**COURSE – 6 : SYNTHETIC ORGANIC CHEMISTRY**

**FIRST ASSIGNMENT**

Maximum Marks -- 15  
Minimum Marks – 06

**SECTION --A – [1x10=10]**

(Essay Type)

(Answer any **One** question from the following Two questions)

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 Wolf Klishner reduction.
2. Write a short note on:
  - a. Robinson Annulation.
  - b. Knoevenagel condensation
  - c. Wittig reaction
  - d. Shapiro reaction
  - e. Give protection and deprotection of carbonyl compounds and amines.

**SECTION – B [1x5=5]**

(Short Type)

(Answer any **One** question from the following Two questions)

1. What is Catalytic hydrogenation? Classify and Explain the mechanism..
2. Write a note on applications of organoboranes in organic synthesis.

**SECOND ASSIGNMENT**

Maximum Marks -- 15  
Minimum Marks – 06

**SECTION --A – [1x10=10]**

(Essay Type)

(Answer any One question from the following Two questions)

1. Write a note on various C-X and C-C disconnection.
2. Explain the following with suitable examples. i. Principles of stereo selectivity, ii. Product selectivity, iii. 1,2-Asymmetric induction.

**SECTION – B [1x5=5]**

(Short Type)

(Answer any One question from the following Two questions)

1. Discuss about various synthetic strategies utilized in the synthesis of cyclic compounds.
2. Write a note on any two methods of chiral catalyst controlled methods

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**COURSE – 7 : NATURAL PRODUCTS, HETROCYCLES, BIOGENSIS AND SPECTROSCOPY**

**FIRST ASSIGNMENT**

Maximum Marks - 15

Minimum Marks – 06

**SECTION --A – [1x10=10]**

(Essay Type)

(Answer any One question from the following Two questions)

1. Write a short note on structure determination of Reserpine and give the synthesis of morphine, cholesterol and give the structures of oestrone, testosterone and vitamin A, B, C, D, E, K.
2. Write a note on a. Enzyme Catalysis. b. Co enzymes c. biosynthesis of aromatic compounds by acetate melonic acid pathway.

**SECTION – B – [1x5=5]**

(Short Type)

(Answer any One question from the following Two questions)

1. Discuss the structure elucidation of PGE<sub>1</sub>α, PGE<sub>2</sub>α, PGE<sub>3</sub>α and give their synthesis and bio synthesis.
2. Write down the steps involved in protein metabolism.

**SECOND ASSIGNMENT**

Maximum Marks -- 15

Minimum Marks – 06

**SECTION -A – [1x10=10]**

(Essay Type)

(Answer any One question from the following Two questions)

1. Discuss any two methods of synthesis and chemical reactions of isoxazole, imidazole, triazole, tetrazole, pyrimidine and aziridines.
2. Discuss the following.
  - a. Types of <sup>13</sup>C NMR spectroscopy.
  - b. Applications of <sup>19</sup>F NMR.
  - c. 2DNMR techniques, OCTANE RULE, ORD CURVE and its applications

**SECTION – B [1x5=5]**

(Short Type)

(Answer any One question from the following Two questions)

1. What are Purine and Pyrimidine bases? Discuss their one synthesis and two reactions for each.
2. Write a note on factors influencing on chemical shift in <sup>13</sup>C NMR spectra.

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**COURSE – 8 : DRUGS & PHARAMACEUTICALS**

**FIRST ASSIGNMENT**

Maximum Marks - 15  
Minimum Marks – 06

**SECTION - A – [1x10=10]**

(Essay Type)

(Answer any One question from the following Two questions)

1. a. Explain the strategies involved in the lead modification from the synthesis of analogues.  
b. Discuss the SAR studies of Sulphonamides.
2. a. What are resins and linkers used in combinatorial synthesis?  
b. Explain about Hansch method of QSAR studies.

**SECTION – B [1x5=5]**

(Short Type)

(Answer any One question from the following Two questions)

1. What is lead and lead discovery? Explain the drug discovery with lead.
2. a. What is Prodrug? Explain the principles of prodrug design.  
b. Write a short note on Broad spectrum antibiotics.

**SECOND ASSIGNMENT**

Maximum Marks -- 15  
Minimum Marks – 06

**SECTION - A – [1x10=10]**

(Essay Type)

(Answer any One question from the following Two questions)

1. a. Write a brief note on Drugs affecting adrenergic nervous system.  
b. What is the importance of Carbonic anhydrase? Explain about the Carbonic anhydrase inhibition.
2. What are ion channels? Discuss about the drugs acting on Sodium ion channels and Calcium ion Channels.

**SECTION – B [1x5=5]**

(Short Type)

(Answer any One question from the following Two questions)

1. a. What are Cholinergic agonist and antagonists? Explain anti cholinesterases.  
b. write a note on Histamine receptor antagonists.
2. Explain the following.
  - a. DNA Polymerase inhibitors
  - b. Pfeiffer's rule
  - c. Quality control methods in Drug analysis.