

ANDHRA UNIVERSITY
DEPARTMENT OF CHEMISTRY
M.SC., CHEMISTRY (FINAL)-III-SEMESTER SYLLABUS
SPECIALIZATION: ORGANIC CHEMISTRY
PAPER I - ORGANIC REACTION MECHANISMS, PERICYCLIC
REACTIONS AND PHOTOCHEMISTRY
(from the batch admitted during the academic year 2021-2022)

UNIT-I

Radical substitution reactions: Reactivity for aliphatic substrates, reactivity at Bridgehead, Reactivity in aromatic substrates, neighbouring group assistance in free radical reactions, reactivity in the attacking radical, effect of solvent on reactivity, halogenation at an alkyl carbon and allylic carbon, hydroxylation at aromatic carbon by means of Fenton's reagent, formation of cyclic ethers with Pb (OAc)₄, Hunsdiecker reaction, Kolbe reaction, Reed reaction and Sandmeyer reaction.

UNIT-II

Elimination reactions: Mechanisms of E₂, E₁, and E₁CB, factors-effects of substrate, attacking base, leaving group and medium. Stereochemistry of eliminations in acyclic and cyclic systems. Saytzeff elimination, Hoffman elimination and pyrolytic elimination.

UNIT-III

Addition reactions:

(a) **Addition to carbon-carbon multiple bonds-** Addition reactions involving electrophiles, nucleophiles and free radicals, cyclic mechanisms. Stereochemistry and reactivity. Hydrogenation of double and triple bonds, Birch reduction, Hydroboration, Michael reaction, Prins reaction. Addition of oxygen and N₂O₄.

(b) **Addition to carbon-hetero atom multiple bonds:** Mechanism and reactivity. Reductions of carbonyl compounds, carboxylic acids, esters, nitriles. Addition of Grignard reagents, Mannich reaction, Reformatsky reaction, Tollen's reaction, Wittig reaction,

UNIT-IV

Pericyclic reactions:

Molecular Orbital Symmetry, MO diagrams of ethylene, 1,3 Butadiene, 1,3,5- Hexatriene and allyl system. Woodward- Hoffman correlation diagram method, Frontier molecular orbital approach (FMO) and Perturbation molecular orbital approach (PMO) for the explanation of pericyclic reactions under thermal and photochemical conditions.

Classification of pericyclic reactions: **Electrocyclic Reactions:** Conrotatory and Disrotatory motions. $4n\pi$ and $4n+2\pi$ electrons systems.

Cycloadditions: Antarafacial and Suprafacial additions. $2+2$, $4+2$ cycloadditions and chelotropic reactions.

Sigmatropic rearrangements-Suprafacial and Antarafacial shifts of H, Sigmatropic shift

involving carbon moieties (1,3), (1,5), (3,3) and (5,5) sigmatropic rearrangements. Claisen, Cope, Oxy-cope and aza-Cope rearrangements. Ene reaction.

UNIT-V

Organic Photochemistry:

Photochemistry of carbonyl compounds- $n\text{-}\pi^*$ and $\pi\text{-}\pi^*$ transitions. Norrish type I and Norrish

type II cleavages. Paterno-Buchi reactions, Photoreduction, Photochemistry of α,β -unsaturated ketones, photochemistry of enones and cyclohexadienones. Photochemistry of unsaturated systems (Olefins): cis-trans isomerisation, dimerization, and addition. Acetylenes-dimerisation. Photochemistry of 1,3-butadienes, di- π -methane rearrangement. Photochemistry of aromatic compounds – 1,2, 1,3, and 1,4-additions. Photo-Fries rearrangement, Photo-Fries reactions of anilides.

Reference Books:

- 1) Advanced Organic Chemistry: Reactions Mechanisms and Structure by Jerry March, Mc.Graw Hill and Kogakush.
- 2) Molecular reactions and Photochemistry by Charles Dupey and O. Chapman, Prentice Hall.
- 3) Pericyclic reactions by S.N. Mukharji, Mcmilan.
- 4) Mechanisms and Theory in Organic Chemistry by T.H. Lowery and K.S. Rich gardson.
- 5) 5) The modern structural theory in Organic Chemistry by L. N. Ferguson, Pretice Hall

ANDHRA UNIVERSITY
DEPARTMENT OF CHEMISTRY
M.SC., CHEMISTRY (FINAL)-III-SEMESTER SYLLABUS
SPECIALIZATION: ORGANIC CHEMISTRY
Paper II- Organic Spectroscopy
(From the batch admitted during the academic year 2021-2022)

UNIT-I

UV SPECTROSCOPY: a) UV spectra of aromatic and heterocyclic compounds, α -diketones, β -diketones, enediones and quinines. Applications of UV Spectroscopy-study of isomerism, determination of strength of hydrogen bonding and conformations of α -substituted cyclohexanones. Steric effect in biphenyls.

UNIT-II

Infrared Spectroscopy: characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols, ethers, phenols, amines, carbonyl compounds, esters, amides, carboxylic acids, anhydrides, lactones, lactams, nitriles and conjugated carbonyl compounds. Effect of hydrogen bonding and solvent on vibrational frequencies.

UNIT-III

Nuclear Magnetic Resonance Spectroscopy (^1H NMR): Nuclear spin, resonance, saturation, shielding of magnetic nuclei, chemical shifts and its measurements, factors affecting chemical shift, chemical and magnetic equivalence of spins, spin-spin coupling, integration, the coupling constant, types of spin-spin couplings, factors influencing coupling constants, first-order and non-first order spectra, spin system notations (ABX, AMX, ABC, A_2B_2 etc.). Simplification of non-first order spectra- use of higher magnetic fields, nuclear magnetic double resonance and contact shift reagents. Deuterium exchange, nuclear overhauser effect difference spectra, Study of dynamic processes by Variable temperature (VT) NMR, restricted rotation DMF, cyclohexane ring inversion.

UNIT-IV

Mass spectroscopy: Basic Principles, instrumentation, isotope abundance, the molecular ion, metastable ions, base peak, fragment ions, even-electron rule and nitrogen rule. McLafferty rearrangement, ortho effect. *retro*-Diels-Alder reaction, Fragmentation processes- fragmentation associated with various functional groups (alkanes, cycloalkanes, alkenes, alkynes, aromatic hydrocarbons, alcohols, phenols, ethers, aldehydes, ketones, esters, carboxylic acids, amides, amines, alkyl chlorides and alkyl bromides).

UNIT-V

Structural elucidation of Organic compounds by a combined application of the UV, IR, NMR and MASS spectral data.

Reference books:

- 1) Spectroscopic identification of organic compounds by RM Silverstein, G C Bassler and T B Morrill
- 2) Organic Spectroscopy by William Kemp
- 3) Spectroscopic methods in Organic chemistry by DH Williams and I Fleming
- 4) Modern NMR techniques for chemistry research by Andrew B Derome
- 5) NMR in chemistry - A multinuclear introduction by William Kemp
- 6) Spectroscopic identification of organic compounds by P S Kalsi
- 7) Introduction to organic spectroscopy by Pavia
- 8) Carbon-13 NMR for organic chemists by GC Levy and O L Nelson
- 9) Nuclear Magnetic Resonance Basic principles by Atta-ur-Rahman

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M.SC., CHEMISTRY (FINAL)-III-SEMESTER SYLLABUS
SPECIALIZATION: ORGANIC CHEMISTRY
PAPER III – ORGANIC SYNTHESIS
(From the batch admitted during the academic year 2021-2022)

UNIT-I

Formation of Carbon-Carbon (C-C) single bonds:

- A) Alkylations via enolate anions-1,3-dicarbonyl and related compounds, direct alkylation of simple enolates, imine and hydrozone anions, enamines. The aldol reaction, umpolung (dipole inversion).
- B) Via Organometallic reagents- organ palladium, organo nickel and organo copper reagents

UNIT-II

Formation of carbon-carbon double bonds:

β - Elimination reactions, Pyrolytic *syn* eliminations, alkenes form hydrazones, 1,2-diols, sulfones, sulfoxide-sulphonate rearrangement, the Wittig and related reactions

UNIT-III

Organic polymers

Introduction to organic polymers, general properties and classification of polymers. Methods of polymerization: (a) Addition polymerization-Definition, synthesis and applications, vulcanization. (b) Condensation polymerization- Definition, synthesis and applications. Radical polymerization. (With atleast two examples in each category)

UNIT-IV

Reactions of unactivated carbon-hydrogen bonds

Unactivated carbon-hydrogen bonds: Definition, mechanism and synthetic applications- The Hoffmann-Loeffler-Freytag reaction (HLF reaction)-cyclisation reactions of Nitrenes-the Barton reaction-Photolysis of organic hypohalites-hypochlorites, hypobromites and hypoiodites,

UNIT-V

Asymmetric Synthesis

Topocity – Prochirality – Substrate selectivity – Diastereoselectivity and enantioselectivity – Substrate controlled methods – use of chiral substrates – examples

Auxiliary controlled methods – Use of chiral auxiliaries – Chiral enolates – alkylation of chiral imines – Reagent controlled methods – Use of chiral reagents – Asymmetric oxidation – Sharpless epoxidation – Asymmetric reduction – borate reagents.

Reference books:

1. Some Modern Methods of Organic Synthesis W. Carothers, Third Edition, Cambridge University Press, Cambridge, 1988.
2. Modern Synthetic Reactions, Herbert O. House, Second Edition, W.A. Benjamin Inc. Menlo Park, California, 1972.
3. Principle of Organic Synthesis- R.O.C. Norman and J. M. Coxon.(ELBS)
4. Advanced organic chemistry part A & B; Fourth edition; Francis A Cary and Richard J. Sundberg; Kluwer Academic/Plenum Publisher New York, 2000.
5. Organic chemistry Jonathan Clayden, Nick Greeves, Stuart Warren, 2nd Edition, 2012, Oxford University Press.
6. Stereochemistry of organic compounds — Principles & Applications by D Nasipuri.
7. Stereochemistry of Carbon compounds by Ernest L Eliel & Samuel H. Wilen.
8. Stereochemistry: Conformation & Mechanism by P S Kalsi.
9. The third dimension in organic chemistry, by Alan Bassendale.
10. Stereo selectivity in organic synthesis by R S Ward.
11. Asymmetric synthesis by Nogradi.
12. Asymmetric organic reactions by J D Morrison and H S Moschr.
13. Principles in Asymmetric synthesis by Robert E. Gawley & JEFFREY AUBE.

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SPECIALIZATION: ORGANIC CHEMISTRY
Paper IV – Chemistry of Natural Products
(From the batch admitted during the academic year 2021-2022)

UNIT-I

Isolation, structure elucidation, stereochemistry, synthesis and biological properties of Penicillin G, Cephalosporin-C, streptomycin, chloramphenicol and tetracyclins

UNIT-II

Isolation, structure elucidation, stereochemistry, synthesis and biological properties of Terpenes: Forskolin, taxol and β -amyryn

UNIT-III

Isolation, structure elucidation, stereochemistry, synthesis, and biological properties of Alkaloids: Morphine, reserpine and vincristine

UNIT-IV

Natural Flavonoids : Apigenin, flavanones-Hesperetin, Isoflavones-Genistein, Flavonolquercetin, xanthone-Euxanthone.

UNIT-V

Natural Pigments: Introduction structure elucidation and synthesis of quinones-Polyphoric acid. Chlorophyll and haemin.

Reference Material:

1. Organic Chemistry, Volume 2, Stereochemistry and chemistry of natural products, I.L. Finar, 5th Edition. ELBS.
2. Chemical Aspects of Biosynthesis, John Mann, Oxford University Press, Oxford, 1996
3. Chemistry of Natural Products. A Unified Approach, N.R. Krishnaswamy, Universe Press (India) Ltd., Orient Longman Limited, Hyderabad, 1999.
4. Chemistry of natural products, S. V. Bhat, Narosa Publishing House, 6th reprint 2010.

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DEPARTMENT OF CHEMISTRY
M.SC., CHEMISTRY (FINAL)-IV-SEMESTER SYLLABUS
SPECIALIZATION: ORGANIC CHEMISTRY
Paper – I: Modern Synthetic Methodology in Organic Chemistry
(For the batch admitted during the academic year 2021-2022)

UNIT – I

Modern Synthetic Methods: Baylis-Hillman reaction, Henry reaction, Nef reaction, Kulinkovich reaction, Ritter reaction, Sakurai reaction, Tishchenko reaction and Ugi reaction. Brook rearrangement; Tebbe olefination. Metal mediated C-C and C-X coupling reactions: Heck, Stille, Suzuki, Negishi and Sonogashira, Nozaki-Hiyama, Buchwald-Hartwig, Ullmann coupling reaction.

UNIT-II

Multi component Reactions: Passerini reaction, Biginelli reaction, Hantzsch reaction and Mannich reaction.

Metathesis: Grubb's 1st generation and 2nd generation catalyst, Olefin Cross coupling Metathesis (OCM), Ring Closing Metathesis(RCM), Ring Opening Metathesis (ROM) and applications.

UNIT-III

Oxidation: Metal based and non-metal based oxidations of (a) alcohols to carbonyls (Chromium, Manganese, aluminium, silver, ruthenium, DMSO, hypervalent iodine and TEMPO based reagents). (b) phenols (Fremy's salt, silver carbonate) (c) alkenes to epoxides (peroxides/per acids based), Sharpless asymmetric epoxidation, Jacobsen epoxidation, Shi epoxidation.(d) alkenes to diols (Manganese, Osmium based), Sharpless asymmetric dihydroxylation, Prevost reaction and Woodward modification, (e) alkenes to carbonyls with bond cleavage (Manganese, Osmium, Ruthenium and lead based, ozonolysis) (f) alkenes to alcohols/carbonyls without bond cleavage (hydroboration-oxidation, Wacker oxidation, selenium, chromium based allylic oxidation) (g) ketones to ester/lactones (Baeyer-Villiger)

UNIT-IV

Reduction:(a) Catalytic hydrogenation (Heterogeneous: Palladium/Platinum/Rhodium/Nickel etc; Homogeneous: Wilkinson). Noyori asymmetric hydrogenation. (b) Metal based reductions using Li/Na/Ca in liquid ammonia, Sodium, Magnesium, Zinc, Titanium and Samarium (Birch, Pinacol formation, McMurry, Acyloin formation, dehalogenation and deoxygenations) (c) Hydride transfer reagents-NaBH₄ triacetoxyborohydride, L-selectride, K-selectride, Luche reduction; LiAlH₄, DIBAL-H, and Red-Al.

UNIT-V

NEWER METHODS IN ORGANIC SYNTHESIS:

Green Chemistry: Introduction, principles, atom economy and scope (illustrate with two examples) **Microwave induced reactions:** Principle conditions, advantages over conventional heating methods-applications

Ionic liquids: Introduction and applications in organic synthesis (illustrate with two examples).

Nanomaterials: Introduction, methods of preparation, applications in organic synthesis

Phase-transfer catalysis: solid-solid, solid-liquid systems-mechanism of catalytic action, type of catalysts, application in few important reactions

Reference books:

1. Some Modern Methods of Organic Synthesis W. Carothers, Third Edition, Cambridge University Press, Cambridge, 1988.
2. F. A. Cary and R. I. Sundberg, Advanced Organic Chemistry, Part A and B, 5th Edition, Springer, 2009.
3. M. B. Smith, Organic Synthesis, 2nd Edition, 2005
4. J. Tsuji, Palladium Reagents and Catalysts, New Perspectives for the 21st Century, John Wiley & Sons, 2003.
5. I. Ojima, Catalytic Asymmetric Synthesis, 2nd edition, Wiley-VCH, New York, 2000.

7. J. Clayden, N. Greeves, S. Warren and P. Wothers, Organic Chemistry, Oxford University Press, 2001.
8. R. Noyori, Asymmetric Catalysis in Organic Synthesis, John Wiley & Sons, 1994.
9. L. Kuerti and B. Czako, Strategic Applications of named Reactions in Organic Synthesis Elsevier Academic Press, 2005.
10. Green chemistry, Theory and Practical, Paul T. Anastas and John C. Warner.
11. New trends in green chemistry By V.K. Ahluwalia and M. Kidwai.
12. Organic Synthesis: Special techniques. V.K. Ahluwalia and Renu Agarwal

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SPECIALIZATION: ORGANIC CHEMISTRY

Paper II- Organic Spectroscopy and Structure determination of natural products

(From the batch admitted during the academic year 2021-2022)

UNIT-I

¹³C NMR spectroscopy

Introduction, ¹³C-chemical shifts, factors affecting the chemical shifts, chemical shifts of organic compounds. Calculation of chemical shifts of alkanes, alkenes and aromatic compounds. Types of ¹³C NMR spectra: Proton-coupled, proton- decoupled and OFF-resonance decoupled (ORD) spectra, DEPT. ¹³C-NMR solvents:

UNIT-II

Heteronuclear NMR spectroscopy & Electron Spin Resonance Spectroscopy (ESR):

Heteronuclear couplings: ¹³C-¹H, ¹³C-D, ¹³C-¹⁹F, ¹³C-³¹P, ¹H-D, ¹H-¹⁹F, ¹H-³¹P, ¹H-¹⁵N

ESR Spectroscopy: Principles, hyperfine splitting

UNIT-III

NMR Instrumentation, 2D-NMR techniques

NMR Instrumentation: Types of NMR Spectrometers-Continuous Wave (CW)-NMR, Fourier Transform (FT)-NMR, NMR solvents, sample preparation

2D-NMR techniques: Principles of 2D NMR, Correlation spectroscopy (COSY) HOMO COSY (¹H-¹H COSY), Hetero COSY (¹H, ¹³C COSY, HMQC), long range ¹H,¹³C COSY (HMBC), NOESY and 2D-INADEQUATE experiments and their applications.

UNIT-IV

Optical Rotatory Dispersion (ORD) and CD Spectroscopy: Optical rotation, circular birefringence, and circular dichroism and Cotton effect. Plain curves and anomalous curves. Empirical and semiempirical rules-The axial haloketone rule, the octant rule, Application of the rules to the study of absolute configuration and conformations of organic molecules.

UNIT-V

Structure determination of natural products by spectral methods

structure elucidation-Spectroscopic techniques IR, UV, $^1\text{H-NMR}$, $^{13}\text{C-NMR}$, COSY, HETEROCOSY, and MS- natural products-Examples, flavones-Apigenin, flavanones- Hesperetin, isoflavones-Genistein, coumarins-7-hydroxycoumarin, alkaloids-morphine, quinine, terpenoids-(-) -Menthol, Steroids-stigmasterol, Glycosides-salicin (Alcoholic β -glucoside)

Text books:

1. Spectroscopy, fourth edition, D. L Pavia, G. M Lampman CENGAGE Learning, 2012
2. Spectroscopic Methods in Organic Chemistry. Forth Edition D. M. Williams and I. Fleming Tata - McGraw Hill, New Delhi, 1990. For all spectral methods except ORD and CD and ESR.
3. Organic Spectroscopy, Second Edition, W. Kemp, ELBS Macmillan, 1987 for ORD and CD and ESR.
4. Chemistry of natural products, S. V. Bhat, Narosa Publishing House, 6th reprint 2010
(For IVth unit)

Books in Reference:

1. Applications of absorption spectroscopy of Organic Compounds J.R. Dyer, Prentice Hall of India, New Delhi, 1984.
2. Spectrometric identification of Organic Compounds, Fourth Edition, R.M. Silverstein: G.C.Vassillr and T.C. Merill, John Wiley, Singapore, 1981.
3. For ORD and CD "Applications of Optical rotation and Circular Dichroism", G.C. Barret, in "Elucidation of Organic structures by Physical and Chemical Methods" Part I (Eds) K.W. Bentley and G.W.Kirty John Wiley, 1972, Chapter VIII (only those aspects mentioned in the syllabus).

ANDHRA UNIVERSITY
DEPARTMENT OF CHEMISTRY
M.SC., CHEMISTRY (FINAL)-IV-SEMESTER SYLLABUS
SPECIALIZATION: ORGANIC CHEMISTRY
Paper – III: DESIGNING ORGANIC SYNTHESIS AND SYNTHETIC
APPLICATIONS OF ORGANO- BORANES AND -SILANES
(From the batch admitted during the academic year 2021-2022)

UNIT-I

Disconnection approach –Principles

Introduction, Terminology: Retrosynthesis, Target Molecule (TM), synthon, synthetic equivalent, functional group interconversion (FGI). Linear and convergent synthesis. Criteria for selection of target. Order of events in retrosynthesis with reference to Salbutamol, Proparacaine and Dopamine. Chemoselectivity, Regioselectivity, reversal of polarity and cyclizations. Protecting groups- Principles of protection of alcohols, amine, carbonyl and carboxyl groups

UNIT-II

Synthetic Strategies-One group disconnections

A) Introduction to one group disconnections: C-C disconnection-alcohols and carbonyl compounds; C-X disconnections- alcohols and carbonyl compounds and sulphides two group C-C and C-X Disconnections.

UNIT-III

Synthetic Strategies-Two group disconnections

B) Introduction to Two group C-C disconnections; Diels-Alder reaction, 1,5-difunctionalised compounds, Michael addition and Robinson annulation. Two group C-X disconnections; 1, 1-difunctionalised, 1, 2-difunctionalised and 1, 3-difunctionalised compounds. Control in carbonyl condensations, explanation with examples oxanamide and mevalonic acid.

UNIT -IV

Organoboranes

Hydroboration- Preparation of Organoboranes. Reagents –dicyclohexyl borane, disiamyl borane, thexyl borane, 9-BBN and mono-, di-isopinocampheyl borane. Functional group transformations of Organo boranes-Oxidation, protonolysis and rearrangements. Formation of carbon-carbon-bonds viz organo boranes- carbonylation, cyanoboration.

UNIT –V

Organo Silanes

Preparation and synthetic applications of trimethylsilyl chloride, dimethyl-tbutylsilyl chloride, trimethylsilyl cyanide, trimethylsilyl iodide and trimethylsilyl triflate. Protection of functional groups- Trimethylsilyl ethers, Silyl enol ethers. Synthetic applications of α -silyl carbanions, β -silyl carbonium ions. Peterson's olefination.

Books for Reference:

1. Organic syntheses via boranes / Herbert C. Brown; with techniques by Gary W. Kramer, Alan B. Levy, M. Mark Midland. New York : Wiley, 1975
2. Some Modern Methods of Organic Synthesis W. Carothers, Third Edition, Cambridge University Press, Cambridge, 1988.
3. Organic Synthesis: The disconnection approach, S. Warrant John Wiley & sons, New York, 1984.
4. 4. Modern Synthetic Reactions, Herbert O. House, Second Edition, W.A. Benzamine, Inc. Menio Park, California, 1972.
5. Principle of Organic Synthesis- R.O.C. Norman and J. M. Coxon.(ELBS)
6. Organic Synthesis: Special techniques. V.K.Ahulwalia and Renu Aggarwal.
7. Organic Synthesis by C Willis and M Willis
8. Problems on organic synthesis by Stuart Warren

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SPECIALIZATION: ORGANIC CHEMISTRY
PAPER IV-DRUG DESIGN AND DRUG CHEMISTRY
(for the batch admitted during the academic year 2021-2022)

UNIT I

Basic consideration of drugs

General Classification, nomenclature, drug metabolism. **Development of drugs:** Procedure followed in drug design, concepts of lead compound lead modification, concept of prodrugs, Structure Activity Relationship (SAR)-factors affecting bio-activity-resonance, inductive effect, isosterism, bio-isosterism, spatial considerations, Quantitative Structure Activity Relationships (QSAR)-Concepts of drug receptors. Elementary treatment of drug receptor interactions. Physico-chemical parameters: lipophilicity, partition coefficient, electronic ionization constants, steric, Shelton and surface activity parameters and redox potentials.

UNIT II

Antineoplastic Agents: Introduction, classification-**alkylating agents**-mechanism and mode of action, nitrogen mustards-synthesis, properties, uses and dosage - Chlorambucil, cyclophosphamide and melphalan. **Antimetabolites**- synthesis, properties, uses and dosage-pyrimidine analogues-5-fluorouracil, purine analogues-6-mercaptopurine, folic acid analogues-Methotrexate. **Antibiotics**-structure, properties and dosage-Doxorubicin, Mitomycin.

UNIT III

Cardiovascular Drugs: Introduction, cardiovascular diseases, drug inhibitors of peripheral sympathetic function, central intervention of cardiovascular output. Direct acting arteriolar dilators. Synthesis of amyl nitrate, sorbitrate, diltiazem, quinidine, verapamil, methyldopa, atenolol, oxyprenolol.

UNIT IV

Oral Hypoglycemic Drugs: Introduction, Classification, **Sulphonylureas**-synthesis, mode of action, properties, uses and dosage- tolbutamide, glipizide. **Biguanides**- synthesis, mode of action, properties, uses and dosage-Metformin. **α -glucosidase inhibitors**- synthesis, mode of action, properties, uses and dosage- Miglitol. **Dipeptidyl Peptidase-4 (DPP-4) inhibitors**- synthesis, mode of action, properties, uses and dosage-saxagliptin and sitagliptin

UNIT V

Local Antiinfective Drugs & Antiviral drugs

Local Antiinfective Drugs: Introduction and general mode of action. Synthesis of sulphonamides, ciprofloxacin, norfloxacin, dapson, amino salicylic acid, isoniazid, fluconazole, econazole and chloroquin.

Antiviral Drugs: Introduction, classification based on mechanism of action, Nucleoside or Nucleotide Reverse Transcriptase Inhibitors (NRTIs)-Synthesis, metabolism, properties and uses and dosage-Acyclovir, Zidovudine (Anti-HIV agent). Non-Nucleoside or Nucleotide Reverse Transcriptase Inhibitors (NNRTIs)-Synthesis, metabolism, properties and uses and dosage-Nevirapine, Efavirenz. Protease Inhibitors (PIs)- Synthesis, metabolism, properties and uses and dosage-Indinavir. CCR5-Inhibitors- Synthesis, metabolism, properties and uses and dosage-Maraviroc

SUGGESTED BOOKS FOR READING

1. Text book of medicinal chemistry, Volume 1 & II, Third edition by V Alagarsamy, CBS-publishers
2. Introduction to Medicinal Chemistry, A Gringuage, Wiley-VCH.
3. Wilson and Gisvold's Text Book of Organic Medicinal and Pharmaceutical Chemistry, Ed Robert F. Dorge.
4. An Introduction to Drug Design, S. S. Pandeya and J. R. Dimmock, New Age International.
5. Burger's Medicinal Chemistry and Drug Discovery, Vol-1 (Chapter.-9 and Ch-14), Ed. M. E. Wolff, John Wiley.
6. Goodman and Gilman's Pharmacological Basis of Therapeutics, McGraw-Hill.
7. The Organic Chemistry of Drug Design and Drug Action, R. B. Silverman, Academic Press.
8. Strategies for Organic Drug Synthesis and Design, D. Lednicer, John Wiley.