VEER NARMAD SOUTH GUJARAT UNIVERSITY

Third Year B. Sc. Semester -VI Chemistry

Paper-VI (Inorganic Chemistry)

Proposed syllabus from July 2021

50 Marks (External) **Total: 30 Hrs**

20 Marks (Internal) **Time: 2 Hrs. (Uni. Exam)**

UNIT - I

Topic-1: Molecular Symmetry: **10 Hrs**

Introduction and importance of symmetry, Symmetry elements and Symmetry operations, Classification of molecules in to point groups. Point group of simple molecules like CO_2, HCl, H_2O, NH_3, BF_3, $[PtCl_4]^{-2}$, PF_5, C_6H_6, $C_5H_5^-$, CH_4, SF_6,**Bromo benzene(C_6H_5Br), Cyclobutane, Boric acid (H_3BO_3),** (Cis and Trans Dicboroethylene ($C_2H_2Cl_2$), Staggered and Eclipsed Ethane (C_2H_6). Law of multiplications, Construction of multiplication table for C_{2v}, C_{3v},C_{2h}

UNIT - II

Topic-1: Metal Complexes (Inorganic Reaction Mechanism): **6 Hrs**

Reaction mechanisms of ligand substitution in octahedral complexes (i) SN_1 (ii) SN_2 Acid hydrolysis &Base hydrolysis -Redox (Single Electron Transfer) reactions, **Substitution reaction without braking M-L bond.**

Topic-2: Hybridization: **4 Hrs**

Bond angles in sp, sp^2 and sp^3 hybrid orbital using wave function (fully mathematical calculations).

UNIT-III

Topic-1: Organo-metallic compounds: **5 Hrs**

Definition, classification, Structure and bonding in ferrocene, dibenzene chromium, Zeise ion andgaseous dimethyl beryllium, **Tetramethyl lead.**

Topic-2: Water Pollution: **5 Hrs**

Types of water pollutants, Trace elements in water and their effects; Determination of BOD, COD, DO, Total hardness, Total dissolved solids, Ozon treatment process for wastewater.

Reference Books:

(1) Introduction to quantum chemistry, by A. K. Chandra, Tata Mc. Graw Hill, Delhi,

(2) Qunatum mechanics in chemistry by M. H. Hanna

(3) Theoritical Inorganic chemistry by Day & Selbin, Affiliated East West

(4) Advanced Inorganic Chemistry by Cotton and Wilkinson, John Wiley

(5) Uni. Chemistry by B. H. Mahan

(6) Structural Inorganic chemistry by A. F. Wells.

(7) Chemical Bonding- an introduction By Rawal, Patel & Patel. Sugumar.

(8) Environmental Chemistry by Amritha Anand

(9) Basic Inorganic Chemistry by Cotton and Wilkinson

(10) A Text book of Inorganic Chemistry by P.L.Soni

(11) Introduction to Inorganic Chemistry by Durrant and Durrant

(12) Modern Co-ordination Chemistry by R. Lewis and R.G. Wilkinson.

(13) Inorganic Chemistry- Principles of structure and reactivity by J.E. Huhhey and E.A. Keiter.

(14) Application of Group Theory to hemistry by P.K.Bhattacharya., Himalaya Pub. House, Mumbai.

(15) Quantum Rasayan, University Granth Nirman Board (Gujarat).

(16) Environmental Chemistry by A.K. De. U.R. (1961), Amold, London.

(17) The corrosion and oxidation of metals by Evans

(18) Corrosion, Causes and Prevention, Speller. F., Mc Graw Hill, New york.

(19) Dhatvik Ksharan, Part-I & II by M.N. Desai, Uni, Granth Nirman Board (Gujarat).

(20) Corrosion and Corrosion Control, Uhlig H. Wiley.

(21) Corrosion Engineering by Fontana M.G. and Green N.D., Mc Graw Hill.
Publ. Pvt. Ltd.

(22) Wiley online library.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

Third Year B. Sc. Semester -VI Chemistry

Paper-VII (Organic Chemistry)

Proposed syllabus from July 2021

50 Marks (External) **Total: 30 Hrs**

20 Marks (Internal) **Time: 2 Hrs. (Uni. Exam)**

UNIT - I

Topic : 1 : MolecularRearrangements **6 Hrs**

Mechanism of rearrangements involving C to C migrations as illustrated by Wagner – Meerwein and Pinocol-Pinacolonerearrangements.

Mechanism of rearrangements involving C to N migrations as illustrated by Hoffmann, Curtius, and Beckmann rearrangements.

Topic : 2 : Catalysis and Green Chemistry **4 Hrs**

Catalysis in organic reaction, nucleophilic catalysis, Metal-ion catalysis, Intermolecular catalysis, Phase transfer catalysis. Green Chemistry : Fundamental Principle of GreenChemistry.

(ii) Green synthesis of(i)Ibuprofen (ii) Paracetamol

UNIT-II

Topic : 1 : Terpenoids (Isoprenoids) : **5 Hrs**

Their occurance , classification , isoprene and special isoprene rule , general methods to determine their structure , analytical and synthetic evidences for the structure of Camphor & Citral.

Topic : 2 : SyntheticPolymers: **5 Hrs**

Basic concepts, Degree of polymerization, Classification of polymerization reaction. Mechanism of Addition or chain growth polymerization, free radical vinyl polymerisation and Ionic vinyl polymerisation, Ziegler – Natta Polymerisation and Vinyl polymers, Condensation or step growth Polymerization, Polyesters, Polyamides, Biodegradable polymers- Introduction,Classification and Application.

UNIT-III

Topic : 1 Conformational Analysis: **5 Hrs**

Conformation, Conformational analysis, Conformations of ethane, Butane and Cyclohexane. Conformational analysis of cyclohexane. Axial and equatorial Hydrogen in cyclohexane. Stability of monosubstituted cyclohexane.

Topic : 2 Synthetic dyes: (Colour and constitutionelectronicconcepts) **5 Hrs**

Definition and difference between dyes and pigments, classification of dyes, color and constitution – Witt's theory, synthesis and uses of Crystal violet, Indigo, Alizarine,Phenolphthalein, Tetrazine, Acriflavine, Procoin Brilliant. Red M-2B.

Reference Books:

(1) Mechanism and Structure in organic chemistry-Goulde.S.

(2) Reaction mechanism in organic chemistry by Mukhargy &Singh

(3) Principles of reaction mechanism in organic chemistry by Dharmaraha &Chawla

(4) Organic reaction mechanism by Bansal Tata Mac.Hill

(5) Organic Chemistry by Hendrickson, Cram &Hammond

(6) Organic Chemistry by Brown R.F.

(7) Organic Chemistry by Solomon W.Graham

(8) Principles of Organic Synthesis- R. O. C.Norman

(9) Basic Principles of Organic chemistry, by R. Y. Caserio, W. A.Benjamin

(10) May's Chemistry of synthetic Drugs byDyson.

(11) Chemistry of drugs, Ener and Caldwell

(12) Synthetic drugs by Tyagi andYadav.

(13) Chemistry of synthetic Dyes Vol. I & II byVenkatraman

(14) Synthetic Organic Chemistry by O. P.Agarwal

(15) Synthetic Dyes by Chatwal &Anand

(16) Chemistry of synthetic Dyes by I. G.Vashi

(17) Organic Chemistry by Morrison andBoyd.

(18) Chemistry of organic Natural Product Vol. I & II by O. P.Agarwal.

(19) Chemistry of synthetic drugs byTrivedi

(20) Green Chemistry, Environmentally Vergin Reactions by V. K. Ahuwalia pub. by Ane booksIndia.

(21) Principles of Medicinal Chemistry Vol.I & II by S.S.Kadam, K.R.Mahadik, K.G.Bothara (NiraliPrakashan)

(22) Medicinal Chemsitry By Asuthosh kar4/e

(23) Organic reactions & their mechanism by P. S. Kalsi, New age internationalpublishers.

(24) Polymer Science Gowariker

(25) Handbook of biodegradable polymer, isolation, synthetic charactrisation and application by Andras, Lendiein and adam sissom.

(26) Stereochemistry Conformation and Mechanisam, 10th Ed. by P. S. Kalsi, New age internationalpublishers

VEER NARMAD SOUTH GUJARAT UNIVERSITY

Third Year B. Sc. Semester -VI Chemistry

Paper-VIII (Physical Chemistry)

Proposed syllabus from July 2021

50 Marks (External) **Total: 30 Hrs**

20 Marks (Internal) **Time: 2 Hrs. (Uni. Exam)**

UNIT - I

Topic : 1 : PHASE EQUILIBRIA **6 Hrs**

Statement and meaning of the terms phase, component, degree of freedom, phase rule, phase equilibria, of one component system- water, CO_2 , sulphur system, phase equilibria of two component system- simple eutectic-, Pb-Ag systems, desilverisation of lead, KI- Water system, freezing mixtures. Solid solutions: compounds with congruent and incongruent melting point (Only definition and example), Three component solid-liquid systems p.no 690-691*

Topic : 2 : BINARY LIQUID MIXTURES **4 Hrs**

Liquid-liquid mixtures, ideal liquid mixtures, Raoult's law, non ideal orreal solutions, positive and negative deviations from Raoult's law, temperature composition curves for ideal and non ideal binary solutions of miscible liquids, azeotropes, partially miscible liquids: Phenol-water systems, immiscible liquids, steam distillation. Chemical Potential of Ideal and non ideal solutions, p.no 756-757* **Numerical problems.**

57 th edition, Principal of physical Chemistry, By Puri, Sharma, Pathania

Vishal Publishing co.

UNIT-II

Topic : 1 : APPLICATION OF ELECTRO MOTIVE FORCE **10 Hrs**

Application of measurements of EMF in the determination of

(1) Solubility product and solubility of sparingly solublesalts

(2) Ionic product of water by galvaniccell

(3) Transport number of ions

(4) Equilibrium constant

(5) pH by Hydrogen, Glass and Quinhydroneelectrodes

(6) Energy sources Ni-Cd Cell and Li- ion Cell, Lithium - Polymer Cell, Numerical problems.

UNIT-III

Topic : 1 : APPLICATIONS OF NUCLEAR CHEMISTRY **10 Hrs**

Application of radio isotopes as tracers in medicines, agriculture, in studying reaction mechanism in photosynthesis and age determination by Carbon- Dating method.Geiger Muller Counter, Q-value of nuclear reactions, Chemical and physical atomic weight scale, Mass defect and Binding energy, Packing fraction and its relation with the stability of the nucleus, Nuclear fission, Atom bomb, Nuclear reactor for power generation and Critical mass, Stellar energy and Hydrogen bomb, Hazards of nuclear radiation. **Numerical problems on** Q- value, Binding energy, Packing fraction, and Energy released during nuclear reactions.

Reference Books:

(1) Elements of physical chemistry by Glasstone andLewis

(2) Physical chemistry by G.M.Barrow

(3) Physical chemistry by W.Moore

(4) Physical chemistry byAtkins

(5) Physical chemistry byG.K.Vemulapalli

(6) Physical chemistry byB.K.Sharma

(7) Physical chemistry by Gurdeepraj

(8) Physical chemistry by Puri, Pathania,Sharma

(9) Essential of Physical chemistry by Bahl andBahl

(10) Physical chemistry by Negi andAnand

(11) Physical chemistry by K.L. KapoorVol1-5.

(12) Physical chemistry by Baliga,Dhavale and ZaveriVol1-3.

(13) Physical chemistry by Dr. S.Pahari

(14) Nuclear chemistry byArnikar

(15) Electro chemistry by S.Glasstone

(16) Electrochemistry by B.K.Sharma

(17) Modern Electrochemistry by J'omBockris andRedd

VEER NARMAD SOUTH GUJARAT UNIVERSITY

Third Year B. Sc. Semester -VI Chemistry

Paper-IX (Industrial Chemistry)

Proposed syllabus from July 2021

50 Marks (External) **Total: 30 Hrs**

20 Marks (Internal) **Time: 2 Hrs. (Uni. Exam)**

UNIT - I

Topic : 1 : FermentationIndustry **6 Hrs.**

Definition, condition favourablefor fermentation process (pH, temperature, presence of othersubstances , absence of preservatives, concentration). Manufacture of ethanol, citric acid, acetone andbutanol, Acetic acid, Lactic acid from molasses, manufacture of penicillin-G.

Topic : 2: Pulp and Paper industry **4 Hrs**

Type of pulp, Manufacture of chemical pulp by Sulphate pulp process, Sulphite pulp process, manufacture ofpaper (conversion of pulp into paper, beating process, importance of fillings, sizing, colouring materials inmanufacture ofpaper and calendaring).

UNIT-II

Topic : 1 : Insecticides and Fungicides **5 Hrs.**

Introduction, Inorganic insecticides, Natural and synthetic insecticides, organic insecticides, Eldrin, Dieldrin, BHC, Tetra ethyl pyrophosphate (TEPP), Introduction of Fungicides like Bordeaux mixture, Dithiocarbamates, Baygon , Termik, Zineb

Topic : 2 : Detergents:

Introduction, Principles detergency, classifiction of surface active agents, Anionic detergents, Cationic detergents, Non-ionic detergents, Amphoteric detergents, Suds regulators, Builders and Additives.

UNIT-III

Topic : 1 : Sugar Industry **5 Hrs.**

Introduction, Manufacture of sugar from sugarcane: Extraction of juice, Purification of juice, Concentration & crystallisation of purified juice, Refining of sugar.

Topic : 2 : Industrial manufacturing process with flow diagram & their uses 5 Hrs.

(1) Preparation of methanol from synthesis gas.

(2) Preparation of Isopropanol from propylene.

(3) Preparation of acetone from isopropanol.

(4) Preparation of formaldehyde from methanol by oxidation dehydration process.

(5) Acetylenefromnaturalgas.

Reference Books:

(1) Shreve Chemical Process Industries, 5ed., George.T. Austin. MacGraw Hill, Book Agency

(2) Reigel's Industrial Chemistry, Ed. By James A. Kent.

(3) Unit Process in Organic Synthesis by D.H. Groggins.

(4) An Introduction to Industrial Chemistry, by Peter Wiseman, Applied Science Pub. Ltd. London.

(5) Industrial Chemistry by B.K.Sharma, Goel Pub.

(6) Quantitative Analysis by R.A.Day & ALUnderwood, 6^{th} ed. Pub. Prentice Hall of India ltd.

(7) Vogel's Text Book Inorganic Quantitative Analysis, 6^{th} ed.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

Third Year B. Sc. Semester -VI Chemistry

Paper-X (Analytical Chemistry)

Proposed syllabus from July 2021

50 Marks (External) **Total: 30 Hrs**

20 Marks (Internal) **Time: 2 Hrs. (Uni. Exam)**

UNIT - I

SPECTROSCOPY: **10 Hrs**

Types of spectrum, Process involved in interaction with matter (Fluorescence, Phosphorescence), Components of spectrophotometer-Sources, Grating and Prism as dispersing device, Sample handling, Detectors- Photo tube, Photomultiplier tube. Block diagram and working of single beam and double beam spectrophotometer. Terms involved in Beer's law (no derivation). Causes of deviation from Beer's law. Analysis of unknown by calibration curves method, standard addition method, and ratio method.

Determination of Cu^{+2}, Fe^{+3}, $NO2^{-1}$, F^{-} using spectrophotometer. (Only principles - no detailed method), Problems based on quantitative analysis

UNIT-II

SEPARATION TECHNIQUE **6 Hrs.**

Topic : 1 : Gas Chromatography:

Classification of chromatography, Principles of GC separation. Components of GC, **Sample introduction system, Columns: Packed column Capillary Column (WCOT, SCOT),** Carrier gas and its selection - stationary phases: Solid adsorbents, Inert supports **(Selection criteria, Diatomaceous earths)** and liquid stationary phases, Detectors: FID, TCD. Qualitative and quantitative analysis using GC.

Topoic : 2 : Liquid Chromatography: **4 Hrs.**

Limitation of conventional liquid chromatography (no detail method). Technique of HPLC. Elementary idea about technique and layout diagrams of instrument. Components of instrument of HPLC technique, **Pumps with merits and demerits, Detector: UV absorption, Refractive Index,** Elementary idea of TLC.

UNIT-III

Topic : 1 : Precipitation Titrations: **5 Hrs.**

Titrations involving Silver salts.

Detection of end points by Mohr's method, Volhard's method, Adsorption indicators. Construction of titration curves. Problems.

Topic : 2 : Redox Titrations: **5 Hrs.**

Formal Potential, Redox reaction: $FeSO_4$-$KMnO_4$, $K_2Cr_2O_7$-$FeSO_4$, Fe^{+2} – Ce^{+4}, Principle of redox indicators, Structural chemistry of indicators (Diphenyl amine, Ferroin). Construction of titration curves for titration of Fe^{2+} with Ce^{4+}.

Nernst equation and calculation of equilibrium constants for redox system, Types of indicators, Theory of true Redox indicators.

Reference Books:

(1) Quantitative Analysis by R. A. Day & A. L. Underwood, 6th ed. Pub. Prentice Hall of India ltd

(2) Vogel's Text Book Inorganic Quantitative Analysis, 6th ed.

(3) Analytical Chemistry (Principles & Technique) by Lary G. Hargis.

(4) Fundamental of Analytical Chemistry by Skoog D. A. & West D. M.

(5) Instrumental Methods of Analysis by B. K. Sharma

(6) Instrumental analysis by R.D.Braun Mc Graw Hill.

(7) Analytical Chemistry….Gary Christian

(8) Analytical Chemistry….Day and Underwood.

(9) **Modern Analytical Chemistry by David Harvey, McGraw Hill Higher Education**

(10) **College Analytical Chemistry, Mangaonkar, Teckchandani, Sathe, Ghalsasi, Jain, Himalaya Publishing House**

(11) **Analytical Chemistry by Alka L. Gupta, Pragati Prakashan.**

(12) **Instrumental Methods of Chemical Analysis by H. Kaur, Pragati Prakashan.**

VEER NARMAD SOUTH GUJARAT UNIVERSITY

Third Year B. Sc. Semester -VI Chemistry

Paper-XI (General Chemistry)

Proposed syllabus from July 2021

50 Marks (External) **Total: 30 Hrs**

20 Marks (Internal) **Time: 2 Hrs. (Uni. Exam)**

UNIT-I

10 Hrs.

Topic : 1 : Chemistry in Consumer Protection :

Define Adulteration; Reasons of Adulteration, Types of Adulterants, Discussion Methods for detection of different adulterants in some common food items

(1) Milk

(2) Milk products: Sweet curd, Rabdi, Khoa & its product, Chhana or Paneer, Ghee, Cottage cheese,condensed milk, Khoa, Ghee, Butter

(3) Oil and Fats Oil and Fats, Mustard oil, Edible oil, Coconut oil

(4) Sweetening agents: Sugar, Pithi sugar, Honey, Jaggery, Bura sugar

(5) Food grain and their product: (Wheat, Rice, Maize, Jowar, Bajra, Chhanaand Barley etc.), Maida, Wheat flour, Besan, Suji (Rawa) Dalwhole and Spilt, pulses

(6) Spices: Whole spices, Black Pepper, Cloves, Mustard seed and Powdered spices

(7) Turmeric whole and Turmeric powder

(8) Chilli powder , Asafoetida,

(9) Miscellaneous Product: Common salt, Tea, Coffee powder,

UNIT-II

10 Hrs.

Topic : 1 : Nano particles:

Introduction of Nano particles, properties of nano particles, Semi conductors, Ceramic nano particles, Catalytic aspects of nano particles, Carbon nano tubes. Applications of Nano particles,

Topic : 2 : Enviornmental pollution:

Introduction types of Pollutions (1) Gaseous pollution in air, Acid rain, Green house effect and ozone depletion.(2) radiation pollution cause, effect and control, Uses of radioactive isotopes in medicine, food safety and industry (Cobalt-60, Iodine-131, Carbon-11, Carbon-14, Sodium-24, Thallium-201, Technetium-99m, Americium- 241, Iridium-192, Uranium-235, Californium-252) (3) Noise pollution and their effect and control (4) Oil pollution and their control.

UNIT-III

Topic : 1 : NMR spectroscopy **10 Hrs.**

Nuclear Magnetic Resonance Spectroscopy – Proton Magnetic Resonance (^{1}H NMR)

Spectroscopy - Nuclear Shielding and Deshielding – Chemical Shift and Molecule Structure, Spin-Spin splitting and Coupling constants - Intensities of signals – Interpretation of NMR spectra of simple organic molecule such as Ethyl bromide, Acetaldehyde, 1,1,2-tribromoethane, Ethylacetate, Toluene, Acetophenone, Nitrobenzene, Cyclopropane, Isomers of Pentane, Hexane and Dibromo propane.

Reference Books:

(1) Quantitative analysis by R.A. Day and A.L. Underwood

(2) Elements of Analytical Chemistry by R. Gopalan ; P.S.Subramanian and K. Rengarajan

(3) Elementary Organic Spectroscopy by by Y.L.Sharma

(4) Organic Spectroscopy by by B.K.Sharma

(5) Environmental Chemistry by H.Kaur.

(6) .http://www.fssi.gov.in/Portals/0/pdf/Final-test-manual-part-II

(7) Vogel's qualitative Inorganic analysis

(8) Vogel's qualitative Organic analysis

VEER NARMAD SOUTH GUJARAT UNIVERSITY

Third Year B. Sc. Semester -VI Chemistry

Chemistry-Generic elective subject–Petrochemicals

Proposed syllabus from July 2021

50 Marks (External) **Total: 30 Hrs**

20 Marks (Internal) **Time: 2 Hrs. (Uni. Exam)**

UNIT - I

Topic : 1 : Petrochemicals obtained from C3-cut of petroleum. **6 Hrs.**

Manufacture and industrial applications of chemicals obtained from Propylene: Isopropyl alcohol, Acetone (Wacker-Chemieprocess), Propyleneoxide (Halcon process), Acrylonitrile, Glycerol and Isoprene, Propylene tetramer, Acrylic acid, n-Butyraldehyde (Oxoprocess), Methyl isobutyl ketone, Methylmethacrylate.

Topic : 2 : **4 Hrs.**

General account of petrochemicals used as monomers in the manufacture of polyester fibers,manufacture of DMT, Terphthalic acid, Phthalic anhydride, Maleic anhydride, 1:4 Butanediol and othermonomerslike Pentaerithritol and Di-isocyanates.

UNIT-II

Topic : 1 : The method for the large scale production with flow diagram and uses of: **5 Hrs.**

(i)Acetoacetanilide (ii) Anthraquinone (iii) β-naphthol from naphthalene (iv) Bon acid (v) Aspirin (vi) Chloramphenicol (vii) Paracetamol (viii) p-Aminophenol.

Topic : 2 : Miscellaneous petrochemicals **5 Hrs.**

Definition of synthetic detergents, hard and soft detergents. Synthesis of DDBS. Synthesis of Fluoresein, Malachite Green, Chrysoidine and Indigo. Definition of Explosive, list of basicraw materials for explosives and list of explosives derives from these raw materials. Synthesis of Tetryl, PETN and Dynamite. Definition insecticides, classification of insecticides on basis of mode of action. Synthesis of Methoxychlor, Captan, Parathion, Malathion.

UNIT-III

Topoic : 1 : Chemicals obtained from C4 & C5 cut of petroleum. **4 Hrs.**

Manufacture and industrial applications of Butadiene, Butylalcohols, Methylterbutyl ether (MTBE), Cyclopentadiene, Sulpholane.

Topic : 2 : BTX aromatic : **6 Hrs.**

Recovery process of BTX, manufacture and industrial applications of benzene, toluene, xylene,naphthalene,phenol, styrene.

Reference Books:

(1) Introduction to petrochemicals by Sukumar Maiti, Oxford and IBH Pubs Co. New Delhi.

(2) A text on petrochemicals by Dr.B.K. Bhaskar Rao, Khanna Pubs. New Delhi.

(3) Chemicals from petroleum by A.L.Wadams (ELBS and John Murray London)

(4) Petrochemicals by S.L.Venkatewarn (Colour Pubs. Pvt. Ltd. Bombay)

(5) PetrochemicalsdigestbyMGKManon(AsiaPublishinghouseBombay)

(6) Hand book of industrial chemicals Vol-I by K. M. Shah (Multi tech publishing co. 15 yogesh,hingwala lane, ghatkoper (E) Bombay-400077)

(7) Industrial chemistry including chemical engineering by B.K.Sharma, Goel Pubs. House, Meerut.

(8) Hand Book of Synthetic Dyes and Pigments (Vol.II) By K.M.Shah, Multi-tech Publishing Co.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

Third Year B. Sc. Semester -VI Chemistry

Chemistry-Generic elective subject–Drugs

Proposed syllabus from July 2021

50 Marks (External) **Total: 30 Hrs**

20 Marks (Internal) **Time: 2 Hrs. (Uni. Exam)**

UNIT - I

Topic – 1: Sedatives, Hypnotics and Anticonvulsant drugs **5 Hrs.**

Definition; Introduction; Classification and Structural variations of Sedatives, Hypnotics and Anticonvulsant drugs; Synthesis and Therapeutic Uses of Luminal (Phenobarbital), Diazepam, Meprobamate, Imipramine, Veronal.

Topic – 2: Anaesthetics **5 Hrs.**

Definition; Introduction of General and Local Anaesthetics, Name and Structures of different General Anaesthetics, Classification and Structural Variation among Local Anaesthetics; Synthesis and Therapeutic Uses of Alpha-Eucaine, Benzocaine, Orthocaine, Lidocaine, Halothane.

UNIT-II

Topic – 1: Antihistamines (Anti-allergic drugs) **4 Hrs.**

Definition; Introduction; General account of Histamine and Anti-allergic drugs; Classification and Structural Variations among Antihistamines; Synthesis and Therapeutic Uses of Antergan, Benadryl (Diphenhydramine), Promethazine (Phenergan), Pyribenzamine, Chlorpheniramine.

Topic – 2: Antidiabetic Drugs (Hypoglycemic agents) **3 Hrs.**

Definition; Introduction; Hypoglycemia; Role of insulin in diabetes; Oral Hypoglycemic agents; Structural Variations among Biguanide and Sulfonylurea derivatives showing Hypoglycemic activity; Synthesis and Therapeutic Uses of Tolbutamide, Metformin.

Topic – 3: Antitubercular and Antileproticdrugs **3 Hrs.**

Definition; Introduction; General account of Tuberculosis and Leprosy; Structural Variations among Antitubercular and Antileprotic Drugs; Synthesis and Therapeutic Uses of Isoniazid, Ethambutol, Dapsone (DDS).

UNIT-III

Topic – 1: Antimalarial drugs **4 Hrs.**

Definition; Introduction; Name and modes of transition of Plasmodium Parasites responsible for Malaria in Human;GeneralClassification of Antimalarial Drugs; Synthesis and Therapeutic Uses of Chloroquine, Mafloquine, Amodiaquine (Camoquine), Primaquine.

Topic – 2: Antiseptics and Disinfectants **3 Hrs.**

Definition;Introduction; Classification and Structural variations among Antiseptics and Disinfectants; Synthesis and Therapeutic Uses of Mercurochrome (Merbromin), *n*-Hexylresorcinol, Halazone, Dichloramine-T.

Topic – 3: Diuretics **3 Hrs.**

Definition; Introduction; Classification and Structural Variations of Diuretics; Mercurial Diuretics and Non-Mercurial Diuretics; Synthesis and Therapeutic Uses of Sorbitol, Acetazolamide, Hydroflumethiazide.

Reference Books:

(1) May's Chemistry of synthetic Drugs by Dyson.

(2) Chemistry of drugs, Ener and Caldwell.

(3) Synthetic drugs by Tyagi and Yadav.

(4) Synthetic Drugs by G. R. Chatwal, Himalaya Publishers.

(5) The Organic Chemistry of Drug Synthesis by Daniel Lednicer&L.A.Mitscher.

(6) Medicinal Chemistry by V.K.Ahluwalia Pub. Ane Books Pvt. Ltd.

(7) Medicinal Chemistry by Ashutosh Kar, New Age International Publisher.

(8) Medicinal Chemistry by Balkishan Razdan, Pub. CBS Publishers.

(9) Pharmaceutical Organic Chemistry by S.K.Dewan, Pub. Narosa.

(10) Medicinal Chemistry - a Molecular and Biochemical Approach, by Thomas Nogrady & Donald F Weaver

(11) Pharmaceutical Organic Chemistry by Shyam Singh Pub. Himalaya Publishers.

(12) Medicinal Chemistry by G Patrick. Pub. Viva Books.

(13) Burger's Medicinal Chemistry & Drug Discovery. Ed. by D. J. Abraham.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

Third Year B. Sc. (SEM –VI)

Chemistry - Generic elective subject – DYES

Proposed syllabus from November/December - 2021

50 Marks (External) **Total: 30 Hrs**

20 Marks (Internal) **Time: 2 Hrs (Uni. Exam)**

UNIT – I

Topic –1: Fluorescent brightening agents: **7 Hrs**

General account, classification of FBA base on chemical constitution with examples, Stillbene and Coumarin derivatives of FBA, synthesis of Tinopal BV, Blankophor-B, Blankophor-G , 3-Phenyl-7-methoxy coumarin, 4 Methyl –3 phenyl-7-amino coumarin, Brilliant Yellow, 3-Phenyl 7-Acetylamino coumarin, 4-Acetylamino-N-butyl Naphthalimide.

Topic –2: Sulphur dyes: **3 Hrs**

General account of sulphur dyes. (a) Sulphur Black (b) Sulphur brown (c) Sulphur red (d) Sulphur blue (e) Vat blue -43

UNIT – II

Topic –1: Reactive dyes: **5 Hrs**

Definition, general account of reactive dyes based on monochlorotriazinyl, dichlorotriazinyl and vinyl sulphone system. Application of reactive dyes, Synthesis of Procion Brilliant red H-3B , Procion Brilliant Yellow M-6G, Remazole Black B, Procion Brilliant – Blue M-R, Reactive Red-B.

Topic –2: Mordent dyes: **5 Hrs**

(i) Definition, classification of mordant dyes with examples, application of mordant dyes synthesis of alizarin and Mordant yellow 2 G

(ii) Heterocyclic Dyes: Introduction Azine dyes, Thiazine dyes, and Cyanine dyes. Synthesis of Safranine – T, Methylene blue, Astrazone pink-FG.

UNIT – III

Topic –1: Azoic dyes: **4 Hrs**

Definition, general account of azoic dyes, fast bases, fast salts, rapid fast colors, rapidogens and rapidazole, synthesis of naphthol AS, Fast blue B base (Dianisidine), Fast Orange GGD, Naphthol ASRL, Fast Orange LG- Base.

Topic –2: Non-textile application of dyes: **6 Hrs**

Food colors, Cosmetic dyes , Dyes for paper and printing inks , Dyes for paints, Dyes for leather and polishes, synthesis of Amaranth , Lithol Rubine, Lithol Red, Crystal violet, Bismark brown G, Eosin, Orange-I, Prontosil, Pyridium, Neutral Red, Mercurochrome. General account of medicinal dyes.

Reference books:

(1) Synthetic organic chemistry by O.P. Agrawal
(2) The chemistry of synthetic dyes and pigments by H. A. Lubes
(3) Chemistry of synthetic dyes VOL I to VII by K. Venkatraman
(4) An introduction to synthetic dyes by D. W. Ranghekar & P. P. Singh
(5) A hand book of synthetic dyes and their application by C. T. Bhastana & V. H. Raichura & others
(6) Chemistry of dyes & Principles of dyeing Vol II by V. A. Shehai
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