**BHARATHIAR UNIVERSITY**

M.Sc. CHEMISTRY

SCHEME OF EXAMINATION (CBCS PATTERN)

**For the students admitted during the academic year 2010-2011 Batch onwards**

| Study Components | Course Title | Ins. hrs / week | Exam | | | | Credit |
|---|---|---|---|---|---|---|---|
| | | | Dur. Hrs. | CIA | Uni. exam | Total | |
| **Semester I** | | | | | | | |
| Paper – I | Organic Chemistry – I (Organic reaction mechanisms) | 4 | 3 | 25 | 75 | 100 | 4 |
| Paper – II | Inorganic Chemistry – I (Nuclear chemistry etc) | 4 | 3 | 25 | 75 | 100 | 4 |
| Paper – III | Spectroscopy, Group theory and computer in Chemistry | 4 | 3 | 25 | 75 | 100 | 4 |
| Practical – I | Organic Chemistry – I | 5 | -- | -- | -- | -- | -- |
| Practical – II | Inorganic Chemistry – I | 5 | -- | -- | -- | -- | -- |
| Practical – III | Physical Chemistry – I | 5 | -- | -- | -- | -- | -- |
| Elective I | | 3 | 3 | 25 | 75 | 100 | 4 |
| **Semester II** | | | | | | | |
| Paper - IV | Organic Chemistry – II (Organic reaction mechanisms) | 4 | 3 | 25 | 75 | 100 | 4 |
| Paper – V | Physical Chemistry-I (Quantum chemistry and Spectroscopy) | 4 | 3 | 25 | 75 | 100 | 4 |
| Paper – VI | Physical Methods in Chemistry | 4 | 3 | 25 | 75 | 100 | 4 |
| Practical - I | Organic Chemistry – I | 5 | 6 | 40 | 60 | 100 | 4 |
| Practical – II | Inorganic Chemistry – I | 5 | 6 | 40 | 60 | 100 | 4 |
| Practical – III | Physical Chemistry – I | 5 | 6 | 40 | 60 | 100 | 4 |
| Elective II | | 3 | 3 | 25 | 75 | 100 | 4 |
| **Semester III** | | | | | | | |
| Paper - VII | Organic Chemistry – III (Chemistry of natural products) | 4 | 3 | 25 | 75 | 100 | 4 |
| Paper - VIII | Physical Chemistry – II (Thermodynamics) | 4 | 3 | 25 | 75 | 100 | 4 |
| Paper – IX | Kinetics of polymerization | 4 | 3 | 25 | 75 | 100 | 4 |
| Practical - IV | Organic Chemistry – II | 5 | -- | -- | -- | -- | -- |
| Practical – V | Inorganic Chemistry – II | 5 | -- | -- | -- | -- | -- |
| Practical - VI | Physical Chemistry – II | 5 | -- | -- | -- | -- | -- |

| Study Components | Course Title | Ins. hrs / week | Exam | | | | Credit |
|---|---|---|---|---|---|---|---|
| | | | Dur. Hrs. | CIA | Uni. exam | Total | |
| Elective III | | 3 | 3 | 25 | 75 | 100 | 4 |
| **Semester IV** | | | | | | | |
| Paper - X | Inorganic Chemistry – II (Coordination chemistry) | 4 | 3 | 25 | 75 | 100 | 4 |
| Paper - XI | Physical Chemistry – III (Reaction kinetics and electro chemistry) | 4 | 3 | 25 | 75 | 100 | 4 |
| Paper - XII | Polymer technology | 4 | 3 | 25 | 75 | 100 | 4 |
| Practical - IV | Organic Chemistry - II | 5 | 6 | 40 | 60 | 100 | 4 |
| Practical – V | Inorganic Chemistry – II | 5 | 6 | 40 | 60 | 100 | 4 |
| Practical - VI | Physical Chemistry – II | 5 | 6 | 40 | 60 | 100 | 4 |
| Elective IV | | 3 | 3 | 25 | 75 | 100 | 4 |
| Practical Viva | | -- | -- | 50 | - | 50 | 2 |
| | Total | | | | | 2250 | 90 |

Electives : **List of Group Elective papers (Colleges can choose any one of the Group papers as electives)**

| | GROUP A | GROUP B | GROUP C |
|---|---|---|---|
| Paper I/Sem I | Dye chemistry | Dye chemistry | Organic Synthesis and structure |
| Paper II/Sem II | Water pollution and Industrial effluent treatment | Water pollution and Industrial effluent treatment | Pharmaceutical Chemistry |
| Paper III/Sem III | Industrial Chemistry | Applied Electrochemistry | Applied Electrochemistry |
| Paper IV/Sem IV | Nano Chemistry and Corrosion Chemistry | Advanced Polymeric Materials | Advanced Polymeric Materials |

**Note :**

1. The Syllabus for the above papers (Except Elective papers) be the same as prescribed for the academic year 2007- 08.
2. The syllabus for Elective papers are furnished below.

## GROUP A & B - ELECTIVE PAPER I
## DYE CHEMISTRY

Subject description:
The contents of this paper present the basics principles of colour and constitution, chemistry of intermediates in dye manufacture and chemistry of pigments. It also includes the synthesis of some specific dyes and their uses

Goals:
To motivate the students to comprehend the synthesis of dyes and their uses.

Objectives:
On successful completion of the course the student should have:
Understood principles of colour and constitution, chemistry of intermediates in dye manufacture and chemistry of pigments.

Unit I – Colour and constitution

Relationship of colour observed to wavelength of light absorbed – Terms used in colour chemistry – chromophores, auxochromes, bathochromic shift, hypsochromic shift. Quinonoid theory and modern theories: Valence bond theory, molecular orbital theory.

Unit II –

Chemistry of organic intermediates used in dye manufacture. Benzene, naphthalene and anthraquinone intermediates.

Nitro dyes, nitroso dyes, azo dyes – principles governing azo coupling – mechanism of diazotization coupling with amines, coupling with phenols. Classification according to the number of azo groups and application – Tautomerism in azo dyes

Unit III – Synthesis of specific dyes and uses

Orange IV, Diamond Black F, Metanil yellow, Tartrazines Direct Deep black, Eriochrome Black T, Eriochrome red B, cellition scarlet B, congo red, Malachite green, methylene blue, safranine – T, Acid Magenta, Cyanin Green G, Alizarine, Benzanthrone, indigo, copper phthalo cyanine, sulphur black – T

Unit IV

Synthesis, reactions and applications of xanthenes dyes, cyanine dyes, acridine dyes, sulphur dyes, anthraquinone dyes: , anthraquinone mordant dyes, , anthraquinone acid dyes and , anthraquinone disperse dyes.

Unit V

Pigments – Introduction – Requirements of organic pigments – Types of pigments – applications. Fluorescent. Brightening agents – application of dyes in other areas – Leather, paper, medicine, chemical analysis, cosmetics, colouring agents, Food and Beverages.

Text & References:

1. Organic chemistry volume – I.L.Finar
2. The chemistry of synthetic dyes volume I, II, III - K. Venkataraman
3. Synthetic dyes – Gurdeep.R.Chatwal
4. An Introduction to synthetic drugs and dyes - Ra. Chawathe Shah
5. An introduction to industrial chemistry - B.K.Sharma

## GROUP A & B - ELECTIVE PAPER II

## WATER POLLUTION AND INDUSTRIAL EFFLUENTS TREATMENT

Subject description:
This paper deals with characteristics of water, water pollution, physico-chemical examination of water and treatment of industrial wastes

Goals:
This paper provides better understanding of water pollution and treatment of industrial effluents.

Objectives:
On successful completion the student should have a good knowledge of treatment & removal of pollutants of different kinds.

Unit I

Characteristics of water – Introduction – sources of water – Hardness of water – units of hardness – problems on calculation of hardness – disadvantages of hard water – scale and sludge formation in boiler – boiler corrosion – softening methods – problems on softening – desalination of brackish water – distillation – electro dialysis and reverse osmosis.

Unit II

Water pollution: Introduction – definition of water pollution – water pollutants – physical and chemical pollution of water – ground water pollution – harmful effects of ground water pollution – surface water. River water and sea water pollution, oil pollution of water, effects of oil pollution in marine water – radioactive materials in water.

Unit III

Complete physico chemical examination of water: collection of samples – colour – odour turbidity -pH– temperature – solids: Total solids, dissolved solids, suspended solids, settable solids – acidity – free carbon dioxide – alkalinity – Hardness – calcium, magnesium, sodium, potassium, iron, aluminium, sulphate, silica, heavy metal such as arsenic, calcium, chromium, copper, lead, manganese, mercury, nickel, selenium, tin and zinc, dissolved oxygen – BOD, COD, permanganate value, ammonia nitrogen – albuminoidal nitrogen – total kjeldhal nitrogen, etc.

Unit IV

Industrial effluents: pulp and paper industries, cotton processing – cane sugar industry, distillery – dairy – Iron production. Electroplating industry – oil field and oil refinery – fertilizer industry – pesticide manufacture – rubber wastes – slaughter house and meat packing – soaps and detergents manufacture – soft drinks manufacturers. Viscose rayon manufacture – radioactive pollution.

Unit V

Treatment of Industrial effluents: primary technique: screening – sedimentation – equalization – neutralization – coagulation. Secondary treatment: Aerated lagoons – trickling filtration – activated sludge process – oxidation ditch – oxidation ponds – anaerobic digestion. Tertiary treatment: Evaporation – reverse osmosis – dialysis – ion exchange – chemical precipitation – activated carbon treatment. Tolerance limits for Industrial effluents.

Text & References:

1. Industrial effluents – N.Manivasakam
2. Physico chemical examination of water, sewage and Industrial effluents – N. Manivasakam.
3. Water pollution- P.K.Goel
4. Engineering chemistry - P.C.Jain & Monika Jain
5. Environmental chemistry - B.K.Sharma
6. Insecticides, Pesticides and Agro based Industries - R.C. Falful, K.Goel, R.K. Gupta

## GROUP A - ELECTIVE PAPER III - INDUSTRIAL CHEMISTRY

Subject description:

This paper deals with fuels, rubber, glass, cement, ceramics, paints, pigments, fertilizers and explosives.

Goals:

To understand various aspects of fuels, rubber, glass, cement, ceramics, paints, pigments, fertilizers and explosives industries.

Objectives:

On successful completion the student should have a good knowledge of various chemicals involved in fuels, rubber, glass, cement, ceramics, paints, pigments, fertilizers and explosives industries

Unit 1

Fuels: Introduction – what is a fuel? – Calorific value – classification of fuels-properties of fuels – petroleum: classification of petroleum- Origin of petroleum – petroleum resources in India – cracking of petroleum: Thermal cracking – catalytic cracking knocking chemical structure and knocking octane rating. Improvement of anti-knocking characteristics of fuel. Non-petroleum fuels. Benzol and power alcohol.

Nuclear fuels: Nuclear reactor, Breeder reactor Disposal of radioactive wastes.

Unit II

Rubber: Importance of Rubber – Coagulation of rubber – drawbacks of raw rubber – rubber fabrication, Vulcanisation –Properties of vulcanised rubber.

Synthetic rubber –Buna- S, Neoprene rubber, Buna –N, Thiokol, silicone rubber, sponge rubber, foam rubber.

Unit III

Glass: Introduction – physical and chemical properties of glass –Raw materials – methods of manufacture; Formation of the Batch material, melting, shaping, Annealing and finishing.

Cement: Manufacturing and setting of cement.

Ceramics: Manufacture process- Application of colours to the pottery- Earthenwares and stonewares.

Unit IV

Paints and pigments;

Pigments: Introduction – Requirements of a pigment Typical inorganic pigments – Application. Paints: Classification of paints –Distempers –Constituents of paints- setting of the paint Requirements of a good paint- Emulsion paints – Latex paints –paint removers Varnishes Solvents and thinners.

Unit V

Fertilizers: Plant nutrients –Fertilizers type – Essential requirements- Fertility of the soil- pH value of the soil, classification of fertilizers, straight and mixed fertilizers

Nitrogenous fertilizers: Manufacture of Ammonium nitrate, Ammonium sulphate, urea, nitrolim CAN

Phosphatic fertilizers: Normal superphosphate and triple superphosphate Potassium fertilizers.

Explosives:

Introduction Classification – Characteristics, Nitro cellulose –TNB- TNT- Dynamite – Cordite, Gun powder –RDX-HMX –Tetryl – Pentryl-Hexyl.

Reference Books:

1. Industrial Chemistry- B.K Sharma
2. Engineering Chemistry- Sharma
3. Engineering Chemistry- P.C. Jain & Monika Jain
4. Industrial Chemistry – B.N. Chakarbarty
5. Engineering Chemistry Kuria Kose & Chemical technology - Shukla

## GROUP A - ELECTIVE PAPER IV
## CORROSION CHEMISTRY AND NANO CHEMISTRY

Subject description:
This paper deals with corrosion, forms of corrosion, determination of corrosion parameters, corrosion inhibition and importance and characterisation of nanomaterials.

Goals:
To comprehend various aspect of corrosion and nano materials

Objectives:
On successful completion the student should have acquired a good knowledge of corrosion inhibition and nanomaterials.

**Corrosion Chemistry**

Unit I – Introduction and principles

Definition – cost of corrosion – importance of corrosion, studies – Electrochemical principles of corrosion – forms of corrosion – Definition, cause and effects – Galvanic – crevice – pitting – intergranular – erosion and stress – expression of corrosion rate

Unit II – Monitoring of corrosion

Determination of corrosion parameters – non electrochemical methods: weight loss and gasometric methods – Electrochemical methods: Polarization methods – Galvanostatic – pentiodynamic and AC impedance methods.

UnitIII- Corrosion Control

Cathodic and anodic protection-use of inhibitiors- Classification of inhibitors-Mechanism of inhibition adsorption isotherms (basic ideas only)

**Nano Chemistry**

Unit IV

Introduction- importance and characterisation of nanomaterials- stability of nanoparticles in solutions- synthesis of metal nanomaterials –Physical methods( Laser Ablation, Evaporation, sputtering and solvated metal dispersion) chemical methods (hermolysis, sonochemical approach ,reduction of metal ions by hydrogen and methanol)- Biosynthesis.

Unit V

Synthesis of semiconductor nanomaterials-precipitation- methods- thermal decomposition of complex precursors- synthesis of ceramic nanomaterials-Physical methods(gas condensation and laser methods) Chemical method(Sol-gel synthesis)- properties Nanomaterials-size effects-optical, electrical and magnetic properties.

Text & References:

1. An Introduction to metallic corrosion by Raj Narayanan, Oxford and IBH, 1983
2. An introduction to corrosion and corrosion inhibition by S.N. Banerjee,

Oxonian Press Ltd, New Delhi.
3. Corrosion Engineering by M.G.Fontana and N.D.Greene McGraw Hill, New York
4. Corrosion and corrosion control by H.H.Uhlig, Wiley Inter science,New York.
5. Corrosion for Science and Engineering by Chamblerlain J and Tretheway K.R, 2nd edn. Longman Scientific & Technical, England, 1995.
6. Nano Technology by Mick Wilson, Kamali Kannangara Geoff Smith, Michelle Simmons and Burkhard Raguse, Overseas press, 2005.
7. Nanomaterials and NanoChemistry , by Catherine Bre'chignac, Phillippe Houdy, Marcel Lahmani, Springer, first edition 2008.
8. Core concepts in Supramolecular Chemistry and Nanochemistry,by Jonanthan Steed and Jerry Atwood Wiler Publishers 2006.
9. Nanostructures and Nanomaterials by G. Cao – Synthesis, Properties and Applications, Imperial College Press, London, 2004, chapters 3,4, and 5.
10.Nano: The Essentials, by T.Prradeep, Tata McGraw Hill, New Delhi, 2007.
11.The Chemistry of Nanomaterials,by C.N.R.Rao, A.Muller and A.K. Cheetham First volume, Wiley – VCH Verlag GmbH & Co. KgaA. Weinheim, 2004.Chapter 4.
12.Introduction to Nanotechnology,by Charles P. Poole Jr. and Frank J. Ownes , WileyPublishers, 2003.

## GROUP B & C - ELECTIVE PAPER III - APPLIED ELECTROCHEMISTRY

Subject description:

It deals with the fundamentals principles of corrosion and its inhibition. It also deals with the measurement of corrosion by different techniques. Four important electroanalytical techniques widely employed in diagnostic and analytical divisions of industries have also been dealt with.

Goals:

To make the students thorough with one of the leading problems threatening the economy of most of the industrialised nations and introduce to them some of the important electroanalytical tools.

Objective:

On successful completion of the course the student should have:
Understood principles of corrosion, corrosion monitoring and corrosion inhibition.
Learnt electroanalytical techniques like cyclic voltammetry, anodic stripping voltammetry and electrogravimetry.

Unit I – Principles of corrosion

Definition – cost of corrosion – importance of corrosion studies – classification of corrosion – expression for corrosion rates – Electrochemical principles of corrosion

Unit II – Corrosion monitoring
Coupon (weight loss) method – electrical resistance method – gasometric method – potentiodynamic polarization method – impedance method – hydrogen permeation method

Unit III – Corrosion inhibition
Inhibition – definition – importance – classification of inhibitors – based on electrode process – based on environment – mechanism of inhibitor action in acidic environment

Unit IV – Electroanalytical Techniques – I
Cyclic voltammetry (CV)– theory – basic instrumentation – applications
Anodic stripping voltammetry (ASV)– theory – basic instrumentation – applications

Unit V - Electroanalytical Techniques – II
Bulk electrolysis- electrogravimetry – controlled potential (potentiostatic) electrogravimetry – electroseparation – controlled current (coulostatic) electrogravimetry – current – time behaviour – comparative account of potentiostatic and coulostatic techniques

Textbooks:
1. An Introduction to metallic corrosion and its prevention by Raj Narayanan.
2. Vogel'sTextbook of Quantitative Chemical Analysis by G.H.Jeffery, J.Bassett, J.Mendham, and R.C.Denney , Longman Scientific & Technical, 5th edition ,1989.
References:
1. Electrochemical methods – fundamentals and applications – Allen J. Bard and Larry R.Faulkner, Wiley International editions
2. Electroanalytical chemistry – Basil H. Vassons and Galen W. Ewing, Wiley Interscience Publication 1983
3. Chemistry Experiments for Instrumental methods – Donald T. Sawyer, William R. Heineman, Janice M. Beebe, John Wiley & Sons, 1984.

## GROUP B & C - ELECTIVE PAPER IV - ADVANCED POLYMERIC MATERIALS

Subject description:
This paper gives a concise idea of the possible polymeric materials used in the most advanced areas of science and technology.

Goals:
To enable students to learn different types of polymers and their composites used in controlled drug delivery, biosensors, conductivity, engineering, etc, their synthetic route and the current trends.

Objective:
On successful completion of the course the student are ready:
To choose any research work related to the advanced polymeric materials.

Unit I – Dendrimers and hyperbranched polymers

Properties of Dendrimers and Hyperbranched Polymers and their Blends:
Dendrimers and their structure, synthesis of Dendrimers, Hyperbranched Polymers and their structure. Synthesis of hyperbranched polymers, branching and polydispersity, conformation, general concepts of polymer blends. Blends of Dendritic polymers with thermoplastics

Unit II – Polymer nano composites

Polyamide/clay nano composites - Synthesis, characterization and properties of Nylon 6- clay hybrid. Polystyrene/clay nano composites – Surface initiated polymerization, syndiotactic polystyrene / clay nano composites, properties. Poly (butylenes terephthalate) (PBT) based nano composites, Epoxy nano composites on layered silicates. Polypropyelene layered silicate nano composites.

Unit III – Synthetis Biomedical polymers for drug delivery

Polymers as biomaterials, biomedical applications of synthetic polymers, synthetic polymers for biomedical applications, poly(α-hydroxy esters), poly (lactic acid), poly (anhydrides), poly (phosphazenes), controlled drug delivery, methods of drug delivery,

Unit IV– Conducting polymers

Correlation of chemical structure and electrical conductivity. Structure of conducting polymers Poly (acetylene), poly (pyrrole)s, poly (thiophene)s, polyanilines, poly (p-phenylene sulphide), poly (p-phenylene vinylene)s. Different methods of synthesis of polyaniline: solution polymerization, interfacial polymerization, electrochemical systhesis, enzyme systhesis and photo induced polymerization of aniline. Applications of conducting polymers: Membranes and ion exchanger, corrosion protection, gas sensors, biosensors, electrocatalysis.

Unit V– Engineering plastics

Acrylonitrile butadiene styrene (ABS),Polycarbonates (PC),Polyamides (PA), Polybutylene terephthalate (PBT), Polyethylene terephthalate (PET), Polyphenylene oxide (PPO),Poly sulphone (PSU), Polyether ether ketone (PEEK). Polyimides, Poly phenylene Sulphide (PPS), Synthetic route, structure, properties and uses.

Textbooks:

1.Advance polymeric materials Editors : Gabriel O. Shonaike & Suresh G. Advani, CRC press–2003

References:

1. Progress in preparation, processing and applications of polyaniline
. Progress in polymer Science 34 (2009) 783 – 810
2. Monographs in electrochemistry Conducting polymers – a new era in electrochemistry Editor: F. Scholz Springer – Verlag, Germany
3. Polymer nano composites Editor: Y-W Mai,Wood head Publishing Ltd. 2006

## GROUP C - ELECTIVE PAPER I - ORGANIC SYNTHESIS AND ANALYSIS

Subject description:

This paper deals with some important methods and selectivity in organic synthesis, mechanisms and the spectral techniques used for the structure determination.

Goals:

This paper provides better understanding of several organic reactions and mechanisms.

Objectives:

On successful completion the student should apply the synthesis to new compounds and mechanism to new organic reactions.

Unit I – Disconnection approach

An introduction to synthones and synthetic equivalents – disconnection approach – functional group interconversions – the importance of the order of events in organic synthesis – one and two group C – X disconnections – chemo selectivity – reversal of polarity – cyclisation reactions – amine synthesis

Unit II – Protecting group

Principle and applications of protection of alcohols, amines, carbonyl, carboxyl and other functional groups.
Retro synthesis and analysis – principle and applications.

Unit III – One and two group C – C disconnections

One C – C disconnections – alcohols and carbonyl compounds – regioselectivity – alkene synthesis – use of acetylenes and aliphatic nitro compounds in organic synthesis.
Two group C-C disconnections – Diels – Alder reactions – 1,3-difunctionalised compounds, α-, β-, unsaturated carbonyl compounds – control in carbonyl condensations – 1,5-difunctionalised compounds – Michael addition and Robinson annulation

Unit IV – Organic Synthesis

C – C and C = C forming reactions – Mannich, Darzen – glycidic ester, Simon-smith, Vilsmeier-Haack, Reformatski, Ullmann and Stork-enamine reactions – Shapiro, Wittig, Horner, Peterson, Heck-Stille and Mc.Murry reactions – ring formation by Dieckmann reaction – Robinson ring annulation – Synthesis of small rings – Simon-Smith reaction – alkali metal reduction – Wolff-Kishner reduction – Huang – Minlon modification – Clemmensen reduction – dehydrogenations – Oppenauer oxidation – osmium tetroxide – meta-chloro perbenzoic acid and their applications.

Unit V – Physical methods of organic structure determination

Electronic trabsitions in enes, enones and arenes – Franck –Condon principle – Woodward – Fieser rules – principle of characteristics group, frequency in IR – identification of functional groups and other structural features of IR – Raman spectroscopy and its applications to organic compounds.

Text & References:

1. Principles of organic synthesis by R.O.C.Norman and J.M.Coxon , ELBS, 1994.
2. Modern synthetic reactions by H.O.House , W.A. Benzamin Inc, California (1972),
3. Advanced organic chemistry, Part A and Part B by F.A.Carey and R.J.Sundburg, Springer, 5th edition,2007.
4. Organic Synthesis The Disconnection Approach by S.Warren ,Wiley and sons 2002.
5. Spectrometric Identification of Organic Compounds by R.M. Silverstein., G.C. Bassler and T.C. Morrill Wiley,1981.
6. Organic Spectroscopy by W. Kemp, Palgrave; 3rd edition,2008.
7. Spectroscopic methods in Organic Chemistry" by D.H.Williams and I.Fleming 4th edition, Tata McGraw Hill, New Delhi, 1988.

## GROUP C - ELECTIVE PAPER II - PHARMACEUTICAL CHEMISTRY

Subject Description:

This paper deals with the basic terminologies, common health problems to the human beings, different types of diseases and the suitable treatments.

Goals:

To understand the types of diseases, their symptoms and the drugs used for curing them. Mechanism of action of drugs is also useful to develop new drugs.

Objectives:

After completing, this study should help the students to compete during their search for jobs in the pharmaceutical companies.

Unit I – Introduction

Important terminologies used in pharmaceutical chemistry – pharmacology – drug – pharmocophore – antimetabolites – mutation – grams test – actinomycetes – immunological agents – vaccines – toxoids – immune – human sera – primary immunization – routes of drug administration – additive effect – synergism – antagonism – placebo – important drugs which cause dependence – dosage – mechanism of drug action – factors influencing the metabolism of drugs – principles of bio assay – encapsulation – naming of drugs

Unit II – Medicinal plants and medicinally important compounds

Indian medicinal plants – medicinal plants in cure of diseases – spices as medicines – medicinal plants in the kitchen garden – plant poisoning – medicinally important compounds of Mg, Al, P, As, Hg and Fe-testing cholesterol in serum-estimation of bilirubin in serum – estimation of urea in serum and estimation of inorganic chlorides in blood serum.

Unit III – Antibiotics and Sulpha drugs

Antibiotics – penicillin – semisynthetic penicillin – chloramphenicol – streptomycin – cephalosporin – antifungals – nystatin – griseofluvin.

Sulpha drugs – sulphathiazole – sulphamerazine – sulphaguanidine – sulphadiazine - mechanism of action – uses.

Unit IV- Analgesics and Antipyretics

Introduction to pharmaceutical chemistry analgesics – Morphine analogues and its modification – Codeine – Synthetic narcotic analgesiscs – Pethidines and methadones – Narcotic antagonists – Nalorphine – Antipyretic analgesics – pyrazoles – salicylic acid – paraaminophenol derivatives – Aspirin and salol hypnotics and sedatives – Barbiturates – Benzodiazipines.

Unit V – Antihypertensive, hypotensive drugs and antineoplastic drugs

Antihypertensive and hypotensive drugs – mechanism of lowering blood pressure – α-methyl dopa – pargyline – bertyline – hydralazine – propranolol and antiarrhythmic agents, anti tubercular drugs – PAS – INH – ethambutol, rifampicin – pyrazinamide.

Antineoplastic drugs – alkylating agents – nitrogen mustards – aziridines – sulphonic acid esters – 1,2 – epoxides – antimetabolites – folic acid and pyrimidine antagonista – vinca alkaloids – hormones – oral contraceptives.

Text & References:

1. Berger, A medicinal chemistry, Wiley interscience, New York, Volume I and II, 1990.
2. Asutosh Kar, Medicinal chemistry, Wiley Eastern Ltd, Chennai, 1992.
3. Bentley and Driver's, Textbook of Pharmaceutical Chemistry, 1985.
4. Wilson, O. Giswold and F.George, Textbook of Organic medicinal and pharmaceutical chemistry, Philadelphia, 1991.