MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.Sc. Chemistry

(Choice Based Credit System)

(with effect from the academic year 2017-2018 onwards)

Sem	Pt	Sub No	Subject Status	Subject Title	Con Tact Hrs/ wk	L Hrs/ wk	P Hrs/ wk	Credits
I	I	1	Language	Tamil/Other Languages	6	6	0	4
	II	2	Language	English	6	6	0	4
	III	3	Core – Paper I	Inorganic Chemistry - I	4	4	0	4
	III	4	Core – Paper - II	Physical Chemistry - I	4	4	0	4
	III	5	Major Practical - I	Volumetric Analysis - I	2	0	2	2
	III	6	Allied I- Paper – I	Allied Chemistry - I	4	4	0	3
	III	7	Allied Practical-I	Allied Chemistry Practical- I	2	0	2	2
	IV	8	Common	Environmental Studies	2	2	0	2
				Subtotal	**30**	**26**	**4**	**25**
II	I	9	Language	Tamil/Other Languages	6	6	0	4
	II	10	Language	English	6	6	0	4
	III	11	Core –Paper III	Inorganic Chemistry - II	4	4	0	4
	III	12	Core – Paper IV	Organic Chemistry - I	4	4	0	4
	III	13	Major Practical II	Volumetric Analysis - II	2	0	2	2
	III	14	Allied 1 -Paper – II	Allied Chemistry - II	4	4	0	3
	III	15	Allied Practical-II	Allied Chemistry Practical- II	2	0	2	2
	IV	16	Common	Social Value Education	2	2	0	2
				Subtotal	**30**	**26**	**4**	**25**
III	I	17	Language	Tamil/Other Languages	6	6	0	4
	II	18	Language	English	6	6	0	4
	III	19	Core – Paper V	Organic Chemistry - II	4	4	0	4
	III	20	Major Practical - III	Inorganic Qualitative Analysis	2	0	2	2
	III	21	Allied - II	Allied Chemistry - I	4	4	0	3
	III	22	Allied Practical - II	Allied Chemistry Practical- I	2	0	2	2
	III	23	Skilled Based-I Core	Agro Chemistry/Food Chemistry	4	4	0	4
	IV	24	Non-Major Elective -I	Food Chemistry /Water Management	2	2	0	2
				Subtotal	**30**	**26**	**4**	**25**
IV	I	25	Language	Tamil/Other Languages	6	6	0	4
	II	26	Language	English	6	6	0	4
	III	27	Core – Paper VI	Physical Chemistry - II	4	4	0	4
	III	28	Major Practical IV	Organic Analysis	2	0	2	2
	III	29	Allied - II	Allied Chemistry - II	4	4	0	3
	III	30	Allied Practical II	Allied Chemistry Practical- II	2	0	2	2
	IV	31	Skilled Based II Common	Personality Development and Yoga	4	4	0	4

	IV	32	Non-Major Elective - II	Dairy Chemistry / Applied Chemistry	2	2	0	2
	V		Extension Activity	NCC/NSS/YRC/YWF	-	-	-	1
				Subtotal	**30**	**26**	**4**	**26**
V	III	33	Core – Paper VII	Organic Chemistry - III	5	5	0	4
	III	34	Core – Paper VIII	Physical Chemistry - III	5	5	0	4
	III	35	Major Elective-I	Polymer Chemistry / Bio Inorganic Chemistry	5	5	0	4
	III	36	Major Elective - II	Analytical Chemistry / Pharmaceutical Chemistry	5	5	0	4
	III	37	Major Practical V	Inorganic Preparation and Physical Constant Determination	8	0	8	6
	III	38	Major Practical VI	Organic Estimation				
	III	39	Major Practical VII	Physical Chemistry Estimations				
	IV	40	Skill Based III Common	Computer	2	2	0	2
				Subtotal	**30**	**22**	**8**	**24**
VI	III	41	Core Paper IX	Inorganic Chemistry - III	6	6	0	4
	III	42	Core Paper X	Organic Chemistry - IV	6	6	0	4
	III	43	Core Paper XI	Physical Chemistry - IV	5	5	0	4
	III	44	Major Practical VII, VIII and IX	Gravimetric Estimation	8	0	8	6
	III	45	Major Practical VIII	Organic Preparation				
	III	46	Major Practical IX	Physical Chemistry Experiments - II				
	III	47	Group Project	Group Project	5		5	4
				Subtotal	**30**	**17**	**13**	**22**
Grand Total					**180**	**143**	**37**	**147**

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Chemistry) / Semester – I / Core-1

INORGANIC CHEMISTRY – I

Objectives

To study the atomic structure from wave mechanical concept

To know the arrangement of elements in the periodic table and the periodic properties.

To understand the different kinds of chemical forces in molecules.

To know the nature of compounds formed by s- and p-block elements.

UNIT I –ATOMIC STRUCTURE

Atom models –Bohr's atom model –orbit and orbital-Dual nature of matter – deBroglie equation (verification not required) - Schrodinger wave equation and its applications (no derivation)- Eigen value and Eigen function-significance of Ψ and Ψ^2 – quantum numbers and their significance-principles governing the occupancy of electrons in various quantum levels, probability distribution of electron around the nucleus – radial probability distribution, Pauli's exclusion principle-Hund's rule, Aufbau principle, Stability of half-filled and fully filled orbitals

UNIT II – PERIODIC PROPERTIES

Long form of periodic table- classification as s, p, d and f block elements -periodicity in properties- variation of atomic and ionic radii, electron affinity, ionisation energy and electronegativity along periods and groups – various scales of electronegativity – Pauling, Mullikan and Allred Rochow's scale of electronegativity – factors affecting the magnitude of electronegativity – applications of electronegativity

UNIT III – CHEMICAL BONDING

Properties of ionic compounds- Lattice energy- definition- Born-Lande equation (derivation not required), factors affecting lattice energy, Born-Haber cycle-enthalpy of formation of ionic compound and stability. Covalent character in ionic compounds-polarization and Fajan's rule .

Valence bond theory – hybridization of atomic orbitals and geometry of molecules – sp, sp^2, sp^3, sp^3d, sp^3d^2 and sp^3d^3 hybridisation with examples. VSEPR theory- shapes of simple inorganic molecules – MO theory- applications of MOT to O_2, F_2, HF and CO- - Paramagnetism of O_2 , comparison of VBT and MOT.

UNIT IV – s-BLOCK ELEMENTS

Occurrence, General characters of s block elements , Position of Hydrogen in the periodic table, Chemistry of Li and Be- their anomalous behaviour and diagonal relationship, Hydrides (classification, general methods of preparation and salient features), hydration energies, solvation and complexation tendencies of alkali and alkaline-earth metals.

UNIT V – p-BLOCK ELEMENTS

Occurence , General characterstics of p block elements, Group study of 13-18 group elements-anamolous behaviour and diagonal relationship. Compounds such as hydrides-, halides, oxides and oxyacids-. Preparation, properties, bonding and structure of diborane, borazine and alkali metal borohydrides. Preparation, properties and technical applications of carbides and fluorocarbons. Silicones and silicates (structures only)-.Interhalogen compounds,

Reference Books

1. B. R. Puri, L. R. Sharma, K. C. Kalia, Principles of Inorganic Chemistry, Shoban Lal Nagin Chand and Co., Delhi, 1996.
2. P. L. Soni, Text Book of Inorganic Chemistry, 20th edition, 2001.
3. R. D Madan, Modern Inorganic Chemistry, S. Chand and company, 13th edition, 2005.
4. J. D. Lee, Concise Inorganic Chemistry, 5th ed., Blackwell Science, London, 1996.
5. F. A. Cotton, G. Wilkinson, C. Murillo and M. Bochman, Advanced Inorganic Chemistry, Wiley India, 6th edition, 2008.

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Chemistry) / Semester – I / Core-2

PHYSICAL CHEMISTRY -I

UNIT I –GASEOUS STATE

Concept of ideal and real gases, gas laws postulates of kinetic theory of gases (no derivation) Types of molecular velocities and their inter relations - mean, rms, most probable velocities - Calculation of most probable velocity, average velocity and root mean square velocity Maxwell's distribution of molecular velocities, statement of equation and explanation (no derivation) – graphic representation - effect of temperature on velocity distribution. Collision diameter - collision number - collision freqeuency - mean free path – Degrees of freedom of gaseous molecules - principle of equipartition of energy - heat capacity and molecular basis. Viscosity of gases and effect of temperature and pressure on coefficient of viscosity.

UNIT - II PHOTO CHEMISTRY

Difference between thermal and photochemical reactions, primary and secondary reactions - Laws of photochemistry – Beer Lambert law, Grotthus - Draper law, Stark-Einstein law - Quantum efficiency – experimental determination of quantum yield.

Energy transfer in photochemical reactions – Jablonski diagram - radiative and non radiative transition - internal conversion, intersystem crossing - qualitative description of fluorescence, phosphorescence - chemiluminescence, bioluminescence, thermoluminescence, photosensitization and quenching - photochemical reactions - kinetics of hydrogen-chlorine, reaction and decomposition of HI. Lasers – principle, types and uses.

UNIT - III NUCLEAR CHEMISTRY

Natural radioactivity - detection and measurement of radioactivity – Geiger Nuttal rule - rate of disintegration and half life period - average life period - nuclear stability, n/p ratio, magic number, mass defect and binding energy - liquid drop model - shell model - isotopes, isobars, isotones and isomers. Artificial radioactivity - nuclear fission and nuclear fusion – mechanisms – applications - differences – Stellar energy - nuclear reactors - hazards of radiations - fertile and fissile isotopes. Applications of radioisotopes – C^{14} dating, rock dating, neutron activation analysis and isotope as tracers - study of reaction mechanism.

UNIT - IV SOLID STATE

Difference between crystalline and amorphous solids - isotropy and anisotropy - crystal lattices – Lattice energy –Born equation and its derivatives laws of crystallography - elements

of symmetry of crystals - crystal systems - unit cell - space lattice - Bravais lattices - Miller indices - cubic and hexagonal packing – radius ratio rule – tetrahedral and octahedral voids Bragg's equation, derivation and applications - determination of structure of crystals by X-ray diffraction methods - rotating crystal and powder method, structure of NaCl, KCl and ZnS. Imperfections in a crystal - Schottky defects, Frenkel defects, Nonstoichiometric defects - use of crystallographic data for the determination of Avogadro number and molecular mass

UNIT - V DILUTE SOLUTIONS

Colligative properties of dilute solutions: relative lowering of vapour pressure, elevation of boiling point, depression of freezing point and osmotic pressure,Ebullioscopic constant-Cryoscopic constant- Relation between colligative properties and Molecular mass –Osmosis-osmotic pressure-.laws of osmotic pressure -osmotic pressure and concentration of solute-Experimental methods for determining various colligative properties, degree of dissociation and association of solutes Abnormal molecular mass – Van't Hoff factor.

Reference books:

1. Principles of physical chemistry - Puri, Sharma and Pathania, Millennium Edition, Vishal Publishing Co
2. Text Book of physical chemistry - P.L. Soni - Sultan Chand.
3. Atkins' Physical chemistry, 9th Edition, Oxford University Press.
4. Advanced Physical Chemistry - Gurdeep Raj, Goel Publishing House.
5. Physical Chemistry, G.M.Barrow, Tata McGraw Hill.
6. Source book of Atomic Energy.Samuel Glastone, East west press

MSU/ 2017-18 / UG-Colleges /Part-III (B.Sc. Chemistry) / Semester – I / Major Practical –I

INORGANIC QUANTITATIVE ANALYSIS -I (VOLUMETRIC)

Objectives

1. To enable the students to acquire the quantitative skills in volumetric analysis.
2. At the end of the course, the students should be able to plan experimental projects and execute them.

Acidimetry and alkalimetry

1. Estimation of oxalic acid – Std. oxalic acid
2. Estimation of Na_2CO_3 – Std. Na_2CO_3
3. Estimation of hydrochloric acid – Std. oxalic acid

Permanganometry

4. Estimation of sodium oxalate – Std. oxalic acid
5. Estimation of ferrous ammonium sulphate – Std. ferrous ammonium sulphate
6. Estimation of ferrous sulphate – Std. oxalic acid

Internal –50 marks

25 marks - Regularity

25 marks – Average of best four estimations in regular class work

External -50 marks

10 marks – Record (atleast 4 volumetric estimations)*

10 marks – Procedure

30 marks – Result

*Experiments done in the class alone should be recorded

(Students having a bonafide record only should be permitted to appear for the practical examination)

Reference books:

1. G.H.Jeffery, J.Bassett, J.Mendham and R.C.Denny 'Vogel's Text book of Quantitative Chemical Analaysis' 5th Edition ELBS.
2. I.M.Kolthoff and E.A.Sanderson, Quantitative Chemical Analysis, S Chand
3. O.P. Pandey, D.N Bajpai, S. Gini, Practical Chemistry, for I, II & III BSc. Students. S.Chand & Company Ltd reprint 2009.
4. V.K.Ahluwalia, Sunitha Dhingra, Adarsh Gulate College Practical Chemistry, Universities Press (India) Pvt Ltd 2008 (reprint)

ALLIED CHEMISTRY - I

Objective

To learn about atomic structure and bonding.
To learn the principles of reactions of organic compounds.
To study about photochemical reactions.
To learn about the importance of polymers and polymer science.
To study about lubricants and some cosmetics in the modern world.

Unit I – Inorganic chemistry

Atomic structure : electronic configuration - Aufbau principle - Pauli's exclusion principle- Hund's rule. Bonding : electrovalent, covalent, hydrogen bonds-orbital overlap - s-s, s-p. Hybridization and VESPR theory - CH_4, C_2H_4, C_2H_2- $BeCl_2$, BF_3, NH_3, H_2O, PCl_5, IF_5, IF_7.

Unit II - Organic chemistry – Principles of reactions

Heterolytic and homolytic cleavage - nucleophiles and electrophiles-reaction intermediates – preparation and properties of carbonium ions, carbanions and free radicals - type of reactions - substitution, addition, elimination and polymerisation reactions.

Unit III-Physical chemistry - Photochemistry

Definition-comparision between thermal and photochemical reactions-Laws of photochemistry-Beer Lambert's law-Grothus Draper law-Einstein's law-Quantum yield-low and high quantum yield-determination of quantum yield-fluorescence, phosphorescence, thermoluminescence, chemiluminescence and bioluminescence-definition with examples-photosensitisation.

Unit IV-Polymer Chemistry

Definition- Monomers, Oligomers and Polymers - Classification of polymers- natural, synthetic- linear, cross linked and network- plastics, elastomers, fibres- homopolymers and co-polymers

Thermoplastics: polyethylene, polypropylene, polystyrene, polyacrylonitrile, poly vinyl
chloride, nylon and polyester - Thermosetting Plastics : phenol formaldehyde and epoxide resin-Elastomers: natural rubber and synthetic rubber - Buna - N, Buna-S and neoprene.

Unit V-Applied Chemistry

Lubricants-classification-criteria of good lubricating oils-synthetic lubricating oils-poly glycols and poly alkene oxides-greases or semi solid lubricants-examples-solid lubricants-graphite

Prepration and uses of shampoo, nail polish, sun screens, tooth powder, tooth paste, boot polish, moth ball and chalk piece.

Reference Books

1. B. R. Puri, L. R. Sharma and K. C. Kalia, Principles of Inorganic Chemistry
2. P. L. Soni, Text Book of Inorganic Chemistry
3. K. S. Tewari and N. K. Vishnoi, A Text Book of Organic Chemistry.
4. Arun Bahl and B.S. Bahl, Advanced Organic Chemistry, S. Chand and Sons.
5. M.K. Jain and S. C. Sharma, Modern Organic Chemistry
6. K.K.Rohatgi Mukherjee, Fundamentals of photochemistry , Wiley Eastern Ltd.
7. B.R. Puri and L.R. Sharma, Principles of Physical Chemistry, Chand & Co.
8. Malcom P. Stevens, Polymer Chemistry – An Introduction
9. V.R. Gowariker, Polymer Science, Wiley Eastern, 1995.
10. Sawyer.W, Experimental cosmetics, Dover publishers, New york, 2000.

MSU / 2017-18 / UG-Colleges / Part-III (B.Sc. Chemistry) /Semester – I / Allied Practical - I

Inorganic Quantitative Analysis

Objective:

To enable the students to acquire the quantitative skills in volumetric analysis.

Acidimetry and alkalimetry

1. Estimation of oxalic acid – Std. oxalic acid
2. Estimation of Na_2CO_3 – Std. Na_2CO_3
3. Estimation of hydrochloric acid – Std. oxalic acid

Permanganometry

4. Estimation of ferrous ammonium sulphate – Std. ferrous ammonium sulphate
5. Estimation of oxalic acid – Std. oxalic acid
6. Estimation of ferrous sulphate – Std. oxalic acid

Internal –50 marks

25 marks - Regularity

25 marks – Average of best four estimations in regular class work

External -50 marks

10 marks – Record (atleast 4 volumetric estimations)*

10 marks – Procedure

30 marks – Result

*Experiments done in the class alone should be recorded

(Students having a bonafide record only should be permitted to appear for the practical examination)

SEMESTER II – PAPER – III

INORGANIC CHEMISTRY- II

Objectives

To know the basic principles of metallurgy and the chemistry of d- Block elements

To learn the chemistry of f- Block elements

To understand the basic concepts of coordination chemistry and early theory

To learn the basic analytical methods

To study the chemistry of noble gases

UNIT-I NOBLE GASES

Occurrence - isolation of noble gases from the atmosphere - separation of the gases from one another - general physical properties - special properties of helium - isotopes of helium - uses of noble gases - importance of inert gases in theoritical chemistry - chemical properties - xenon chemistry: preparation and properties of fluorides, oxides and oxofluorides of xenon - xenates and perxenates - xenon fluoride complexes - structure and bonding in xenon compounds. Fluorides of Krypton and Radon - hydrates and clathrates of noble gases - uses of clathrate compunds.

UNIT II- CHEMISTRY OF d - BLOCK ELEMENTS

Occurence, General characteristics of d- Block elements – Group study of Titanium, Vanadium,Iron, Coinage and Zinc group metals. Important compounds of transition metals: Ziegler – Natta catalyst. Prussian blue, Sodium nitroprusside, Turnbull's blue, Nickel DMG complex, Wilkinson's Catalyst- $KMnO_4$ and $K_2Cr_2O_7$.

UNIT III- CHEMISTRY OF f- BLOCK ELEMENTS

Occurrence, General characteristics of f-block elements, Synthetic elements, comparative account of lanthanides and actinides – oxidation states, magnetic properties, colour and spectra – separation by ion exchange and solvent extraction methods – lanthanide contraction — preparation, properties and uses of ceric ammonium sulphate, thorium dioxide, thorium nitrate, uranium hexafluoride, uranylacetate.

UNIT IV- METALLURGY

Occurrence of metals- Ores and minerals in lithosphere -Mineral wealth of India- principles of metallurgy-concentration of ores – froth floatation, magnetic separation, calcination,

roasting and smelting. Purification of metals – electrolysis, zone refining, van Arkel deBoer methods. Extraction of the following metals in pure form - Li, Be, Ti, V, Th and U

UNIT V: THEORY OF INORGANIC PRACTICALS

Qualitative Analysis: Applications of solubility product and common ion effect in the precipitation of cations – Interfering acid radicals and their elimination (oxalate, fluoride, borate, phosphate, chromate, arsenite and arsenate).

Titrimetry: Primary standard- Molarity, molality formality, normality, wt% ppm, milli equivalence and millimoles -problems Types of titrimetric reactions – acid-base, redox, Iodometric, Iodimetric, precipitation and complexometric titrations – Indicators.

Gravimetric analysis: Precipitation from homogeneous soloution- precipitants -conditions for precipitation – co-precipitation and post precipitation - washing of precipitates. Minimisation of errors.

Reference Books

1. Puri B.R., Sharma L.R., Kalia K.K., Principls of Inorganic Chemistry, 28th edition, Vallabh Publication, 2004, New Delhi.
2. R.D. Madan, Advanced Inorganic Chemistry, 2nd edition.S. Chand & Company, 2005, New Delhi.
3. Concise coordination chemistry – R. Gopalan, V. Ramalingam, Vikas publishing House, PVT LTD, 2001, New Delhi.
4. J.D.Lee, Concise Inorganic Chemistry, 5th edition, Oxford University Press, New Delhi 2008.
5. G.H. Jeffery, J. Bassett, J. Mendham, R.C. Denny, Vogel's Text book of Quantitative Chemical Analysis, 5th Edn., ELBS, 1989.
6. D.A.Skoog and D.M.West, Fundamentals of Analytical Chemistry, Holler Saunders College publishing, USA.VI Ed., 1998.

MSU / 2017-18 / UG-Colleges / Part-III (B.Sc. Chemistry) /Semester – II / Core - 4

ORGANIC CHEMISTRY - I

UNIT- I CLASSIFICATION AND NOMENCLATURE

Classification of organic compounds - based on the nature of carbon skeleton – functional groups – classification of C and H atoms of organic compounds.(primary, secondary, tertiary)

IUPAC system of nomenclature of common organic compounds (upto C-10) – alkanes, alkenes, alkynes, cycloalkanes, bicycloalkanes with and without bridges and aromatic compounds.

Naming of organic compounds with one functional group - halogen compounds, alcohols , phenol, aldehydes, ketones, carboxylic acids and its derivatives, cyano compounds, amines and nitro compounds (Both aliphatic and aromatic)

Naming of compounds with two functional groups - naming of compounds with more than one carbon chain.

Naming of heterocyclic compounds containing one and two hetero atoms present in five and six membered rings. Structural isomerism – types with examples

UNIT-II FUNDAMENTAL CONCEPTS

Hybridisation and geometry

Electronic effects - inductive effect, resonance effect – resonance structures– conditions for

resonance –stability of resonance structures, hyper conjugation ,electromeric effect. Steric effect – steric overcrowding – steric inhibition– steric relief(with examples).

Dissociation of bonds – homolysis and heterolysis- radicals – carbocations – carbanions – electrophiles and nucleophiles Influence of electronic effets - dipole moment – relative strengths of acids and bases – stability of olefins – stability of radicals, carbocations and carbanions

UNIT-III HYDROCARBONS

Addition to unsymmetrical olefins (Markownikoff's rule and peroxide effect), hydroboration, ozonolysis, dihydroxylation with $KMnO_4$, allylic bromination by NBS (mechanisms not required).

Classification of alkadienes, stability of conjugate dienes- Mechanism of 1, 2 and 1,4-addition- Diels-Alder reaction. Acidity of alkynes and formation of metal acetylides

UNIT -IV HALOGEN DERIVATIVES

Type of reactions - substitution, addition, elimination and polymerisation reactions

S_N1 and S_N2 mechanisms - E_1 and E_2 mechanisms- Hoffmann's and Saytzeffs rule- preparation, properties and uses of chloroform, carbon tetrachloride, vinyl chloride and allyl chloride- preparation and uses of westron, westrosol, freon and chloroprene

UNIT-V ALCOHOLS & ETHERS

Distinction between primary, secondary and tertiary alcohols – nitroglycerol, dynamite- estimation of hydroxyl groups- mechanism of dehydration of alcohols- preparation and properties of allyl alcohol

Preparation and uses of oxirane and dioxan –Estimation of number of methoxy groups-Zeisel's method

Distinction between ethers and alcohols.

Reference Books :

1. K. S. Tewari and N. K. Vishnoi, A Text Book of Organic Chemistry, Vikas Publishing House Pvt Ltd.
2. Arun Bahl and B.S. Bahl, Advanced Organic Chemistry, S. Chand and Sons.
3. M.K. Jain and S. C. Sharma, Modern Organic Chemistry, Visal Publishing Co.
4. N. Tewari, Advanced Organic Reaction Mechanism, Third Edition 2011, Books & Allied (P) Ltd.
5. I. L. Finar, Organic Chemistry Volume I, ELBS, Longmans
6. Organic Chemistry – Bhupinder Mehta and Manju Mehta - PHI Learning Pvt Ltd.

INORGANIC QUANTITATIVE ANALYSIS -II (VOLUMETRIC)

Iodometry

1. Estimation of copper – Std. copper sulphate
2. Estimation of $K_2Cr_2O_7$ – Std. $K_2Cr_2O_7$

Dichrometry

3.Estimation of ferrous iron – Std. ferrous ammonium sulphate

4. Estimation of $K_2Cr_2O_7$ – Std. $K_2Cr_2O_7$

Complexometry

5. Estimation of Zn – Std. $ZnSO_4$
6. Estimation of Pb – Std. $ZnSO_4$
7. Estimation of Mg – Std. $ZnSO_4$

Internal –50 marks

25 marks - Regularity

25 marks – Average of best four estimations in regular class work

External -50 marks

10 marks – Record (atleast 4 volumetric estimations)*

10 marks – Procedure

30 marks – Result

*Experiments done in the class alone should be recorded

(Students having a bonafide record only should be permitted to appear for the practical examination)

Reference books:

1. G.H.Jeffery, J.Bassett, J.Mendham and R.C.Denny 'Vogel's Text book of Quantitative Chemical Analaysis' 5th Edition ELBS.
2. I.M.Kolthoff and E.A.Sanderson, Quantitative Chemical Analysis, S Chand
3. O.P. Pandey, D.N Bajpai, S. Gini, Practical Chemistry, for I, II & III BSc. Students. S.Chand & Company Ltd reprint 2009.
4. V.K.Ahluwalia, Sunitha Dhingra, Adarsh Gulate College Practical Chemistry, Universities Press (India) Pvt Ltd 2008 (reprint)

ALLIED CHEMISTRY - II

Objective

To learn the chemistry of basic aromatic compounds.
To understand the nuclear particles and few nuclear reactions
To know about carbohydrates, amino acids, proteins and nucleic acid.
To study about fuels, fertilizers, cement and glass.
To know about some common diseases and the drugs used.

UNIT 1 ORGANIC CHEMISTRY

Aromatic compounds

General characteristics of aromatic compounds - aromaticity – Huckel's rule with examples- non – benzenoid aromatic compounds (definition and examples only)

Preparation, properties and structure of benzene, naphthalene and anthracene.

UNIT 2 PHYSICAL CHEMISTRY

Nuclear chemistry

Nuclear stability – n/p ratio – packing fraction – mass defect – binding energy - isotopes, isobars, isotones with examples. Separation of isotopes by diffusion method – group displacement law - radioactive series - Nuclear fission, fusion - Application of radio isotopes (radio diagnosis and therapy, C-14 dating).

UNIT 3 BIO CHEMISTRY

Carbohydrates –definition and classification – artificial synthetic sweeteners. Amino acids - classification – amphoteric nature – isoelectric point. Proteins - classification according to composition, solubility and shape - colour reactions - biological action . Nucleic acids – purines, pyrimidines, nucleocides, nucleotides – DNA – structure of DNA – RNA - different types of RNA

UNIT 4 INDUSTRIAL CHEMISTRY

Fuel gases – Water gas, Producer gas, L.P.G, Gobar gas and Natural gas. Fertilizers – N.P.K and mixed fertilizers. Soaps and detergents – an elementary idea of soaps and detergents. Cleansing action of soaps and detergents. Cement and glass: Portland cement-manufacture only. Manufacture of glass- types and uses borosilicates -photochromic and safety glass.

UNIT-5: PHARMACEUTICAL CHEMISTRY

Common diseases – infective diseases – insect borne –air borne – water borne – hereditary diseases. Definition and examples of analgesics, antipyretics, sulpha drugs, antimalarials and, antibiotics. Diabetes – causes – hyper and hypoglycemic drugs. Indian medicinal plants – tulsi, neem, keezhanelli- their importance

Reference Books

1. Puri, Sharma & Kalia, Principles of Inorganic Chemistry, Milestone Publishers and Distributors, 2008.

2. P.L. Soni, Text book of Inorganic Chemistry, Sultan Chand and Sons, 2007.

3. Bahl and Arun Bahl, Organic Chemistry, S. Chand and Sons, New Delhi , 2005.
4. Morrison & Boyd, Organic Chemistry, VIth ed, Prentice Hall of India Pvt. Ltd., New Delhi, 1998.
5. P. L. Soni, Text book of Organic Chemistry, S. Chand and Company Ltd., New Delhi .

6. J. L. Jain, Sunjay Jain and Nitin Jain, Fundamentals of Biochemistry, S. Chand and Company Ltd.,New Delhi, 2005.

7. S. Lakshmi, Pharmaceutical Chemistry, S. Chand and Sons, New Delhi , 1995.

MSU / 2017-18 / UG-Colleges / Part-III (B.Sc. Chemistry) /Semester -II / Allied Practical - II

INORGANIC QUALITATIVE ANALYSIS

Inorganic simple salt containing one acidic radical (interfering radical) and one basic radical

1. Acidic radical

   Interfering acidic radicals:

   Borate, Fluoride, Oxalate and Phosphate.

2. Basic radicals

   Group I : Lead

   Group II : Copper, Cadmium

   Group III : Ferric iron

   Group IV : Cobalt, Nickel

   Group V : Barium

   Group VI : Magnesium, Ammonium.

Internal –50 marks

25 marks - Regularity

25 marks – Average of four experiments in regular class work

External -50 marks

10 marks – Record (atleast 4 experiments)*

10 marks – Procedure

30 marks – Result

*Experiments done in the class alone should be recorded

(Students having a bonafide record only should be permitted to appear for the practical examination)