

பருவம்: முதற் பருவம்

பாடக் குறியீட்டு எண்: LT101S

அலகு

பாடங்கள்

1. அலகு – 1 (மரபு கவிதைகள்)

- 1.1 வள்ளலார்
- 1.2 பாரதியார்
- 1.3 பாரதிதாசன்
- 1.4 கவிமணி
- 1.5 கண்ணதாசன்

2. அலகு – 2 (புதுக்கவிதைகள்)

- 2.1 அப்துல் ரகுமான்
- 2.2 மு. மேத்தா
- 2.3 வைரமுத்து
- 2.4 தமிழ்ச்சி
- 2.5 நாட்டுப்புறப்பாடல்கள்

3. அலகு – 3 (இலக்கிய வரலாறு)

- 3.1 இருபதாம் நூற்றாண்டுக் கவிஞர்கள்
- 3.2 புதுக்கவிதையின் தோற்றமும், வளர்ச்சியும்
- 3.3 சிறுகதையின் தோற்றமும், வளர்ச்சியும்
- 3.4 நாட்டுப்புற இலக்கியங்கள்

4. அலகு- 4 (சிறுகதைகள்) கதவு – கி.ரா

- 4.1 கதவு
- 4.2 குடும்பத்தில் ஒரு நபர்
- 4.3 ஜெயில்
- 4.4 மின்னல்
- 4.5 எழுத மறந்த கதை

5. அலகு – 5 (மொழித் திறன்)

- 5.1 வல்லொற்று மிகுமிடம்
- 5.2 வல்லொற்று மிகாமிடம்

SEMESTER – I ENGLISH THROUGH LITERATURE – I LE101S

UNIT - 1 [15 HRS]**RELATIONSHIPS**

Freedom at Midnight – Larry Collins and Dominique Lapierre (Prose)
Night of the Scorpion – Nissim Ezekiel (Poem)
Driving Miss Daisy – Alfred Ubry (Play)

UNIT-2 [15 HRS]**SELF ENHANCEMENT**

Ulysses – Alfred Lord Tennyson (Poem)
Our Urgent Need for Self-esteem – Nathaniel Brandon (Prose)
Emotional Intelligence – Daniel Goleman (Prose)

UNIT - 3 [15 HRS]**BASIC GRAMMAR**

The Sentence

Parts of Speech

Nouns – Classes and Gender

Nouns – Number and Case

Adjectives

Comparison of Adjectives

UNIT- 4 [15 HRS]
BASIC LANGUAGE SKILLS

Dialogue Writing

Letter writing – [Formal, Informal]

Comprehension

Text

1. Elango, K. **Insights : A Course in English Literature and Language**. Hyderabad: Orient Black swan Private Limited, 2009.
2. Bhatnagar, R.P., and Bhargava, Rajul. **English for Competitive Examinations**. Chennai: Macmillan India Press, 2002.
3. David Green, **Contemporary English Grammar: Structures and Composition**. Chennai: Macmillan India Limited, 2004.

Reference

1. Prince, Donna. **Skills for Success**, New York: CUP 1998.
2. Wallace, Michael, J. **Study Skills in English**. Kottayam: CUP, 2004.

SEMESTER – I ORGANIC CHEMISTRY – I CH101S

Unit -I BASIC CONCEPTS.

12hrs.

- 1.1 IUPAC nomenclature of organic compounds- naming of simple organic Molecules , practicing line formula for organic molecules
- 1.2 Geometry of molecules – Hybridisation sp^3 , sp^2 , sp with examples.
- 1.3 Cleavage of Bonds – Homolytic and heterolytic cleavage.
- 1.4 Bond energy, Bond length and Bond angle.
- 1.5 Electron displacement effects – inductive, inductomeric, electromeric, resonance, hyperconjugation and steric effects.
- 1.6 Reactive Intermediates: Carbocations, Carbanions, Carbenes and free radicals.

Unit – II: ALKANES & CYCLOALKANES

12 hrs.

- 2.1 Alkanes – methods of preparation: Wurtz reaction, hydrogenation of alkenes, hydrolysis of Grignard reagents, Kolbe's method. Physical and Chemical properties of alkanes.
- 2.2 Cycloalkanes – Preparation using Wurtz's reaction – Dieckmann's ring closure and reduction of aromatic hydrocarbons.
- 2.3 Substitution and ring opening reactions of cycloalkanes.
- 2.4 Bayer's strain theory and theory of strain less rings.

Unit-III ALKENES

12hrs.

- 3.1 Alkene Nomenclature - structure and bonding - Isomerism in Alkenes – properties – stability.
- 3.2 Preparation of Alkenes – Elimination reactions: Dehydration of Alcohols, Dehydrohalogenation of Alkyl halides. E1 and E2 mechanism. Hofmann and Saytzeff's rules – Problems related to these mechanism.
- 3.3 Addition reactions of Alkenes: Hydrogenation, Halogenation, Hydrohalogenation - mechanisms – Markovnikov's rule and Anti Markovnikov's rule. Mechanism of Hydration , Hydroboration, Ozonolysis, Hydroxylation with $KMnO_4$. Self-addition. Polymerization of Ethylene and Propylene problems.

UNIT – 4 – ALKYNES AND DIENES

12 hrs

- 4.1 Alkynes – Sources of Alkynes - Nomenclature – acidity of alkynes – addition reactions – hydrogenation, Hydrohalogenation, Hydration with $HgSO_4$
- 4.2 Preparation of Alkynes by elimination reactions , Ozonolysis of alkynes Alkylation of alkynes using acetylides.
- 4.3 Dienes - preparation of dienes, classes of dienes - conjugated, isolated and cumulative - stability of dienes - addition of hydrogen halides & halogens to conjugated dienes - Polymerization of dienes– Diels-Alder reaction - Problems
- 4.4 Allenes – preparation and bonding.

UNIT – V : STEREOCHEMISTRY – I**12hrs**

- 5.1 Conformational isomerism: Conformers, Dihedral angle, torsional strain.
- 5.2 Conformational analysis of ethane and n-butane, conformers of cyclohexane (chair, boat and skew boat forms), axial-equatorial positions and their interconversions, conformers of mono and disubstituted cyclohexanes, 1,2 and 1,3 interactions.
- 5.3 Geometrical isomerism: Cis – trans, syn-anti and E-Z notations, Methods of distinguishing geometrical isomers using melting point, dipole moment, dehydration, cyclisation and heat of hydrogenation.

Text Books:

1. Francis A.Carey, - Organic Chemistry- Tata McGraw Hill-1999.
2. Seyhan Ege- Organic Chemistry-A.I.T.B.S Publishers-1999.

Reference Books:

1. Ahluwalia and Parassar- Organic Reaction mechanisms, Narosa Publishers.2004.
2. Bahl & Arun Bahl- Advanced Organic Chemistry, Sultan Chand-1996.
3. Paula Yurkanis Bruice - Organic Chemistry, Prentice Hall- 1999.
4. E.L. Eliel and S.H.Wilers , Stereochemistry of Organic Compounds , John Wiley and sons , 2004.
5. P.S.Kalsi , Stereochemistry : Conformation and Mechanism , Wiley Eastern Ltd -2007.

SEMESTER – I Kinetic theory of gas and Chemical kinetics CH102T**UNIT – I****(12 hrs)**

1.1 Unit conversion.

1.2 Kinetic model of gases laws from the kinetic gas equation – Kinds of speed – mean, rms, most probable velocities.

1.3 Diffusion and Effusion- molecular collisions. (Pages 20 – 27)

UNIT – II**(12 hrs)**

2.1 Maxwell's distribution of molecular speeds –Variation with temperature and molar mass.

2.2 Real gas equation –critical temperature – compression factor

2.3 Virial equations of state –Vanderwaals equation of state- Boyle temperature.

2.4 joule –Thomson effect- Linde refrigerator. [Pages 22-34]

UNIT-III**(12 hrs)**

3.1 The rate of reactions – Rate- rate laws and rate constants- reaction order- determination-integrated rate law – half – lives.

3.2 Temperature dependence of a reaction rates – Arrhenius parameters- Collision theory- Activated complex theory.- Catalysis- homogeneous and heterogeneous. (Pages 215 -240)

UNIT-IV**(12 hrs)**

4.1 Reaction mechanisms-elementary reactions –rate law formulation –SSA-rate determining step-reactions on surfaces unimolecular reactions –mechanism of enzyme action – Michaelis-Menton equation. Surface reactions – kinetics of surface reactions – RE and LH mechanism.

4.2 Enzyme inhibition (Pages 244-258)

UNIT-V**(12 hrs)**

5.1 Chain reactions –structure of chain reactions- the rate laws of chain reactions- explosions and explosion limits. (Pages 259-262)

5.2 BET theory – adsorption from solutions – Gibbs adsorption isotherm - applications of adsorption.

Text BooksP.W. Atkins. Elements of Physical chemistry. Oxford university Press. 3rd edition. 1990.**Further reading**Puri and Sharma. Principles of physical chemistry. 40th edition. 2003Arun Bahl, B.S. Bahl and G.D. Tuli . Essentials of Physical Chemistry. 26th edition (revised multicolour). 2009

SEMESTER – I ALLIED MATHEMATICS – I AMT101S

Unit-1: [18 HRS]

ALGEBRA: Binomial-exponentials-logarithmic series (without proof) summation and approximation-problems

Unit-II: [18 HRS]

MATRICES: Characteristic equation of a square matrix– Eigen roots and eigen vectors – Cayley – Hamilton theorem [without proof] – Verification and computation of inverse matrix-diagonalisation of matrices.

Unit-III: [18 HRS]

DIFFERENTIAL CALCULUS: n-th derivatives – Leibnitz theorem [without proof] and applications – Jacobians– Curvature and radius of curvature in Cartesian co-ordinates and polar co-ordinates.

Unit-IV: [18 HRS]

FOURIER SERIES: Bernoulli's formula for integration by parts-fourier series for the function in $(0,2\pi)$ and $(-\pi,\pi)$ – half range fourier series.

Unit-V: [18 HRS]

LAPLACE TRANSFORMS: Laplace Transformations of standard functions and simple properties – Inverse Laplace transforms – Applications to solutions of linear differential equations of order 1 and 2 –problems.

Text Book:

1. P. Durai Pandian and S. Udayabaskaran. 1997. Allied Mathematics. Vol I & II. Chennai: Muhil Publishers.

Reference Books

1. P. Balasubramanian and K. G. Subramanian. 1997. Ancillary Mathematics, Vol I & II. New Delhi: Tata McGraw Hill.
2. S.P.Rajagopalan and R.Sattanathan. 2005. Allied Mathematics. Vol I & II. New Delhi: Vikas Publications.
3. P. R. Vittal 2003. Allied Mathematics.Chennai: Marghan Publications.
4. P.Kandhasamy, K. Thilagavathy . 2003. Allied Mathematics Vol I & II. New Delhi: S. Chand & Co Ltd.

SEMESTER – I VALUE EDUCATION VE101

Unit I

Values-concept-definition-characteristics-division of values-important of value education

Unit II

Personal values;self concept,self esteem,self acceptance,attitude

Unit III

Youth problems;career decision and unemployment,emotional and sexual adjustment, autonomy versus dependence feeling of inferiority,marriage and family,identity of roles,vocational problems and social discrimination,suggestions to cope up with stress.

Unit IV

Social values

Relationship with (family,college,and friendship)and social responsibility

Moral values-honesty love and concern for others-truthfulness-justice.

Unit V

Religious values and cultural values - Various religions of the world - Religions tolerance - Unity in diversity – secularism - Ahimsa vs terrorism

Text Book

Value Education - P. Paul

பருவம்: இரண்டாம் பருவம்

பாடக் குறியீட்டு எண்: LT202S

அலகு பாடங்கள்

அலகு – 1

- 1.1 திருமூலர்
- 1.2 சம்பந்தர்
- 1.3 திருநாவுக்கரசர்
- 1.4 மாணிக்கவாசகர்
- 1.5 ஆண்டாள்

அலகு – 2

- 2.1 பட்டினத்தார்
- 2.2 மஸ்தான் சாகிபு
- 2.3 குமரகுருபரர்
- 2.4 கலிங்கத்துப் பரணி
- 2.5 நந்திக்கலம்பகம்
- 2.6 முக்கூடற்பள்ளு

அலகு – 3 (உரைநடை)

நம்மால் முடியும் தம்பி நம்பு
எம்.எஸ்.உதயமூர்த்தி

அலகு- 4 (இலக்கிய வரலாறு)

- 4.1 சைவ சமயக் குரவர்
- 4.2 ஆழ்வார்கள் (ஆண்டாள், குலசேகர ஆழ்வார் மட்டும்)
- 4.3 சிற்றிலக்கியங்கள் (பரணி, பள்ளு, பிள்ளைத் தமிழ், கலம்பகம் மட்டும்)
- 4.4 இசுலாமும் தமிழும்
- 4.5 உரைநடை வளர்ச்சி

அலகு – 5 (மொழித் திறன்)

- 5.3 கலைச் சொல் ஆக்கம்
 - 5.3.1 அறிவியல்
 - 5.3.2 ஆட்சித்துறை
 - 5.3.3 கணினி
 - 5.3.4 புழங்கு பொருட்கள்
- 5.4 மொழிபெயர்ப்புப் பகுதி
 - 5.4.1 கடிதங்கள்

SEMESTER – II ENGLISH THROUGH LITERATURE – II LE202S

UNIT -1 [15 HRS]**PROSE : Contemporary Issues**

The First Atom Bomb – Marcel Junod

Climatic Change and Human Strategy – E. K. Fedcrov

Corruption : Causes, Consequences and Agenda for Further Research – Paolo Mauro

UNIT- 2**LIFE STORIES** [15 HRS]

The Diary of a young girl – Anne Frank

Wings of Fire – A.P.J. Abdul Kalam

Mother Teresa – F. G. Herod

UNIT - 3 [15 HRS]**BASIC GRAMMAR**

Articles

Pronouns – Personal, Reflexive and Emphatic

Pronouns – Demonstrative, Indefinite, Interrogative, Distributive and Reciprocal.

Pronouns – Relative

Verbs – Transitive and Intransitive, Active and Passive Voice

Verbs – Mood and Tense

UNIT - 4.**WRITTEN COMMUNICATION SKILLS** [15 HRS]

Precis Writing

Note Making

Report Writing

Text

1. Elango, K. Insights : **A Course in English Literature and Language**. Hyderabad: Orient Black Swan Private Limited, 2009.
2. Bhatnagar, R.P., and Rajul Bharagava. **English for Competitive Examinations**. Chennai: Macmillan India Press, 2002.
3. David Green, **Contemporary English Grammar: Structures and Composition**. Chennai: Macmillan India Limited, 2004.

Reference

1. Prince, Donna. **Skills for Success**, New York: CUP 1998.
2. Wallace, Michael, J. **Study Skills in English**. Kottayam: CUP, 2004.

SEMESTER – II INORGANIC CHEMISTRY – I CH203T

Unit – I Atomic orbitals and General periodic properties of elements (12 hrs)

- 1.1. Atomic orbitals - Shapes of s, p, d, f orbital. Hund's rule of maximum multiplicity-applications of Hund's rule- Aufaubau principle - Pauli's exclusion principle - electronic configuration of elements - Stability of half filled and completely filled orbitals - classification of s, p, d and f block elements.
- 1.2. General periodic properties of elements - Periodic table- IUPAC - nomenclature of Inorganic compounds - Atomic radii and ionic radii – size - ionization energies – electron affinity - oxidation states and variable valency - Inert pair effect – electro negativity - Pauling's and Mulliken scale- Alfred Rochow scale.
- 1.3. Applications of electronegativities – Calculation of partial ionic character of a covalent bond, Calculation of enthalpies of formation of compounds - Calculation of bond length - Explanation of diagonal relationship.

Unit – II - Chemistry of Alkali and Alkaline earth metals (12 hrs)

- 2.1. Chemistry of Alkali metals: Occurrence, comparative study of elements - oxides, halides, hydroxides and carbonates. Exceptional properties of Li. Diagonal relationship of Li with Mg.
- 2.2. Chemistry of Alkaline earth metals : Comparative study of elements – oxides - hydroxides, halides, sulphates and carbonates. Exceptional properties of Be. Diagonal relationship of Be and Al. Comparison of alkali metals with alkaline earth metals. Mg acting as bridging element between II A & II B groups resemblance of Mg with Zn.
- 2.3. Hydrogen bonding – Intra and Inter molecular hydrogen bonding – properties of hydrogen bonded Nitrogen, Oxygen and Fluorine compounds.

Unit – III - Chemistry of p – block elements - Boron family (12 hrs)

- 3.1. Chemistry of p – block elements – Boron family- group discussion – anomalous behavior of B - diagonal relationship between B & Si - electron deficiency & electron acceptor behavior of BX_3 .
- 3.2. Boron hydrides - Bonding in diborane, (VBT & MOT approach) Bonding in tetraborane. Borax- sodium borate, sodium tetraborate, or disodium tetraborate - Boric acid.
- 3.3. Compounds of Boron with Nitrogen - Borazole and Boron nitrides.

Unit – IV Ionic, Covalent bonding and Acid- Base concepts (12 hrs)

- 4.1 Ionic Bond : Conditions for the formation of ionic bond – Radius ratio rules and its limitations – formation of NaCl – Hydration energy – Lattice energy and their applications – Born haber cycle. General properties of ionic compounds.
- 4.2 Covalent bonding : Polarisation and Fajan's rule, Effects of polarization , VBT conditions for the formation of covalent bond – orbital overlap– hybridization- sigma and pi bonds - Characteristics of Covalent Compounds. Hannay smith equation.
- 4.3 Acid- Base concepts – Lewis - Bronsted, Lux flood , Isanovich concepts & HSAB approach.

Unit – V - VSEPR Theory and Molecular Orbital Theory**(12 hrs)**

- 5.1. VSEPR Theory: Molecular shapes predicted by Sidgwick's powell theory – Effect of lone pairs and Electronegativity – Effects of bonding and lone pairs on bond angles. Geometries of ClF_3 , IF_7 , XeF_6 , BF_4^- , BO_3^{3-} , NH_4^+ , I_3^- .
- 5.2. Molecular Orbital Theory : LCAO method, criteria of orbital overlap – types of molecular orbitals - sigma and pi molecular orbitals, combination of atomic orbital to give sigma and pi molecular orbitals and their schematic illustration.
- 5.3. Qualitative molecular energy level diagram of homo and hetero diatomic molecules – H_2 , N_2 , O_2 , CO , NO & HCl – bond order and stability of molecules.

Text Books:

1. J.D. Lee, A New Concise Inorganic Chemistry, 3rd Edn., ELBS, 1987.
2. R.D. Madan, Modern Inorganic Chemistry , 3rd Edn., Sulthan Chand Publications, 1988.
3. D.F. Shriver, P.W. Atkins, C.H. Langford, 3rd Edn. Inorganic Chemistry, ELBS. 1999.
4. W.V.Mallik, G.D. Tuli, R.D. Madan, Selected topics in Inorganic Chemistry, 4rd Edn., Sulthan Chand Publications, 1992.
5. P.L. Sony & Mohan Katyal , Text book of Inorganic Chemistry, Sulthan Chand Publications, 1985.

Reference Books:

1. F.A. Cotton, G. Wilkinson, Advanced Inorganic Chemistry, 5th Edn., John Wiley. 1985.
2. B. Douglas, D. McDaniel, J. Alexander, Concepts and Models of Inorganic Chemistry, 3rd Edn., John Wiley, 2001.
3. J.E. Huheey, Inorganic Chemistry, 5th Edn., Harper International. 1993.

SEMESTER – II ANALYTICAL CHEMISTRY-I CH204T

UNIT – I**(12Hrs)**

Theory of Errors – idea of significant figures and its importance with examples – Precision, Accuracy- methods of expressing accuracy – Error analysis – minimizing errors – method of expressing precision – average deviation – Standard deviation – Confidence limit.

UNIT – II**(12Hrs)**

Definitions of Molality – Normality – Mole fraction and their calculations – Definition and examples for primary and secondary standards – Calculation of equivalent. Theories of acid base – Redox, complexometric and Iodometric titrations. Theories of indicators – acid, base, redox, metal ion and adsorption indicators and choice of indicators.

UNIT – III**(12Hrs)**

Problems on Volumetric analysis-strengths of solutions – Equivalent weights of Compounds – Law of Normalities – acid, Alkali titrations – Double and back titrations. Chemical formulae and percentage composition – Determination of empirical Formulae – Determination of molecular formulae. Law of conservation of mass – Law of constant composition – Law of multiple proportions – Law of reciprocal proportions – Gay Lussac's law of Gaseous volumes.

UNIT – IV**(12Hrs)**

Chemical Instrumentation: Elementary Electronics, Simple integrated circuit, Semiconductor, Power supply, transformer, Operational amplifier, Detectors (Oscilloscope and recorders), transducers, Rectifiers, Signal to noise ratio, Electronic components (Resistors, capacitors, inductors, transistors), Measuring instruments for pressure, temperature, pH, speed, flow, current and voltage.

UNIT – V**(12Hrs)**

Significant figures – Rounding off – addition – subtraction – multiplication – division using Significant figures – calculation of absolute error – Relative error – percentage error – calculation of molarity – molality – mole fraction – normality – calculation of equivalent weight of acids, bases, salts, oxidising agents and reducing agents – problems on laws of chemical combination.

Text Books:

1. R.Gopalan, P.S.Subramanian, K.Rengarajan, S.Chand and sons (1997) - Elements of Analytical Chemistry.
2. G. R. Chatwal, S. K. Anand - Instrumental Methods of Chemical Analysis – Himalaya Publishing House (2000)

Reference Books

1. D.A. Skoog and D.M. West, Fundamental of Analytical Chemistry, International Edition, 7th Edition (1996), Saunders College Publishing, Philadelphia, Holt, London.
2. R.L. Pecsok, L.D. Shields, T. Cairns and L.C. Mc William, Modern Methods of Chemical Analysis, 2nd (1976), John Wiley & Sons, New York.

SEMESTER – II ALLIED MATHEMATICS – II AMT202

Unit-1: THEORY OF EQUATIONS**[18 HRS]**

Polynomial Equations with real Coefficients – Irrational roots – Complex roots – Symmetric functions of roots – Transformation of equation by increasing or decreasing roots by a constant – Reciprocal equations – Newton's method to find a root approximately-problems .

Unit-2: TRIGONOMETRY**[18 HRS]**

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin \theta$, $\cos \theta$, $\tan \theta$ – Expansions of $\sin \theta$, $\cos \theta$, $\tan \theta$ in terms of θ – Hyperbolic and inverse hyperbolic functions – Logarithms of complex numbers.

Unit-III: APPLICATION OF INTEGRATION**[18 HRS]**

Evaluation of double, triple integrals – Simple applications to area, volume and centroid.

Unit-IV: PARTIAL DIFFERENTIAL EQUATIONS**[18 HRS]**

Formation-complete integrals and general integrals-Four standard types-Lagrange's equation.

Unit-V: VECTOR ANALYSIS**[18 HRS]**

Gradient- Directional derivatives – Unit vector normal to a surface – angle between the surfaces- divergence, curl-Line and surface integrals – Gauss, Stoke's and Green's theorems [without proofs) problems based on these theorems.

Text Book:

1. P. Duraipandian and S. Udayabaskaran. 1997. Allied Mathematics. Vol I & II. Chennai: Muhil Publishers.

Reference Books

1. P. Balasubramanian and K. G. Subramanian. 1997. Ancillary Mathematics, Vol I & II. New Delhi: Tata McGraw Hill.
2. S.P.Rajagopalan and R.Sattanathan. 2005. Allied Mathematics. Vol I & II. New Delhi: Vikas Publications.
3. P. R. Vittal 2003. Allied Mathematics. Chennai: Marghan Publications.
4. P.Kandhasamy, K. Thilagavathy . 2003. Allied Mathematics Vol I & II. New Delhi: S. Chand & Co Ltd.

பருவம் : இரண்டாம் பருவம்

பாடக் குறியீட்டு எண் : EBT 201

அலகு - 1

எளிய முறையில் தமிழ் கற்றல்.

1. பட்டம் - சட்டம் - கட்டடம் - தட்டு - வட்டம் - மாமா
2. பாடம் - சட்டி - கட்டி - தட்டி - வடம் - மாமி
3. பட்டி - சடை - கடை - தடை - வடை - மாதா
4. படி - சாதம் - கார் - தார் - வான் - மாதம்
5. படை - சாவி - காவி - தாள் - வான் - அம்மா - அப்பா
6. பாப்பா -
7. பாட்டி -
8. பாட்டு -

சிறு தொடர்.

பாப்பா படி - பாட்டி கடை - கட்டடம் கட்டித்தா -
பாப்பா பாடம்படி - பாட்டி தட்டு -
பாப்பா பாட்டு படி - பாட்டி வடைத்தட்டு

பயிற்சி.

குடும்பத்தினர் (அ) நண்பருடன் பேச்சுத் தமிழில் உரையாடல்
குறில் நெடில் வேறுபாட்டால் பொருள் மாறுபடும் சொற்கள்
பரம் - பாரம் கரம் - காரம் வரம் - வாரம் சரம் - சாரம்
தரம் - தாரம்

அலகு - 2

உயிரெழுத்துக்கள், ஆய்த எழுத்து, மெய்யெழுத்துக்கள் - வகை, எண்ணிக்கையுடன் அறிதல்.

உயிர்மெய் எழுத்துகள் உருவாதலைக் கற்றல்:
(வல்லின மெய்கள்)

க் + அ - க ற் + ஓள - றொள
K + A - KA RR + OU - RROU

அலகு - 3

உயிர்மெய் எழுத்துகள் மெல்லினம், இடையினம்

ங் + அ = ங ன் + ஓள - னொள
NG + A - NGA N + OU - NOU

ய் + அ = ய ள் + ஓள - ளொள
Y + A - YA LL + OU - LLOU

ஒலி வேறுபாட்டால் பொருள் மாற்றம் (ர-ற, ன-ண, ல-ள, ழ)

அரம் - அறம்

உன் - உண்

வால் - வாள் - வாழ்

ஒவ்வொன்றிற்கும் ஐந்து எடுத்துக்காட்டு தருக.

அலகு - 4

சொல்-வகை

ஓரெழுத்து ஒருமொழி

பெயர்:

ஆ, பூ, தீ, தை, கா (சோலை)

வினை:

வா, போ, ஈ (கொடு)

தா, கா (காத்தால்)

ஈரெழுத்து ஒருமொழி:

பெயர்:

கனி, பனி, வான், காடு, வீடு

வினை:

நில், படி, பார், காண், எழு

தொடர்மொழி: பெயர்:

கபிலர், வெள்ளிவீதியார், திருவள்ளுவர், ஆண்டாள், கம்பர், பாரதியார்
முக்கனி, முத்தமிழ், மூவேந்தர், நாற்றிசை, ஐம்பொறி - இவற்றிற்கு விளக்கம் தருக.
முறைப்பெயர் (உறவுப்பெயர்) அம்மா, அப்பா, மாமா,

அலகு - 5

உடலுறுப்புப் பெயர்கள்:

தலை முதல் அடி வரை உள்ள உறுப்புகள்

முதலெழுத்து மாற்றத்தால் பொருள் மாற்றம் பெறும் உடலுறுப்புகள் சான்றாக:

உதயம் - இதயம்

ஊக்கு - மூக்கு

பண், மண் - கண்

படி - அடி

மரம், வரம் - கால்

கல் - பல்

ஆல், பால் - கால்

கொடை - தொடை

அலை, இலை - தலை

மாது - காது

பாக்கு, வாக்கு - நாக்கு

கிழி - விழி

எழுத்து - கழுத்து

பறவைப் பெயர்கள்:

மயில், அன்னம், கிளி, புறா, குயில்

வீட்டு விலங்குகள்:

பசு, ஆடு, குதிரை, நாய், பூனை

மலர்கள்:

தாமரை, மல்லிகை, முல்லை, செண்பகம், அல்லி

நிறங்கள்:

வானவில்லின் வண்ணங்கள் - அறிதல்

எண்கள்:

ஒன்று முதல் ஐம்பது வரை எழுத்தால் எழுதுதல்

சிறுகதை:

“புலியை ஏமாற்றிய நரி” தமிழ் - நான்காம் வகுப்பு, தமிழ் நாட்டுப் பாடநூல் கழகம், சென்னை.

SEMESTER – II PERSONALITY DEVELOPMENT EPD201

Unit I

Personality

Meaning-definition-major determinants of personality genetic determinants, social determinants, cultural determinants, psychological determinants, theories Jung's typology trait theory psychoanalytical theory importance of personality development guidance to improve personality.

Unit II

Mental health

Meaning-concept-definition-characteristics - influential factors - biological factors - psychological factors - socio-economic and cultural factors

Unit III

Stress and its management

Meaning,definition causes of stress, major life changes and environmental events - consequence of stress, stress management techniques.

Unit IV

Part-a

Anger and its management;

Meaning, definition, nature-causes-symptoms and consequence of anger - physiological effects and psychological effects, techniques to control anger.

Part-b

Suicidal prevention

Unit V

Soft skills development - Presentation skill - Interpersonal skill - Body language

Text Book;

Mental health of rural youth

Reference;

Personality development-Elizabeth .B.Hurlock

SEMESTER – II PRACTICAL CHEMISTRY – I CHP201

VOLUMETRIC ANALYSIS**UNIT-I TITRIMETRIC QUANTITATIVE ANALYSIS**

Preparation of a standard solution

Making up a given solution and doing a titration

Preparing a standard solution and doing a titration

Estimation of HCl by NaOH using a standard oxalic acid solution

Estimation of Na_2CO_3 by HCl using a standard Na_2CO_3 solution

Estimation of Oxalic acid by KMnO_4 using a standard oxalic acid solution

Estimation of Iron (II) Sulphate by KMnO_4 using a standard Mohr's salt solution

Estimation of Iron (II) Sulphate by $\text{K}_2\text{Cr}_2\text{O}_7$ using a standard Mohr's salt solution

Estimation of Copper (II) Sulphate by $\text{K}_2\text{Cr}_2\text{O}_7$ solution.

Estimation of Magnesium(II) by EDTA solution.

UNIT – II**SOME APPLIED EXPERIMENTS**

Estimation of total Hardness of water

Estimation of antacid

Estimation of Bleaching powder

Reference books:

- 1.Venkateswaran V, Veerasamy R., Kulandaivelu A.R.1997. Basic principles of Practical Chemistry. (2nd ed) New Delhi:Sultan chand & Sons
2. Basset.J.,et al.1985. Vogel's Textbook of Quantitative Inorganic Analysis, (4th ed) ELBS Longmann.

SEMESTER – II QUALITATIVE ANALYSIS CHP202

UNIT – I SEMI – MICRO QUALITATIVE ANALYSIS

1. Analysis of simple acid radicals:

Carbonate, Nitrate, Sulphate, Chloride

2. Analysis of interfering acid radicals:

Fluoride, Oxalate, Borate, Phosphate

3. Elimination of interfering acid radicals and identifying the groups of the basic Radicals

4. Analysis of basic radicals (group-wise):

Lead, Copper, Bismuth, Cadmium, Aluminium, Iron, Cobalt, Nickel, Manganese, Zinc, Barium, Calcium, Strontium

5. Analysis of mixtures containing two cations and two anions (of which one is interfering)

UNIT –II PREPARATION OF INORGANIC COMPOUNDS

1. Tetrammine Copper(II) Sulphate

2. Tris (thiourea) Copper I Chloride

3. Ferrous Ammonium Sulphate

4. Microcosmic salt

5. Potassium tris oxalate ferrate II

6. Chloropentammine Cobalt III Chloride

Reference books:

1. Inorganic Qualitative Analysis- V.V. Ramanujam

2. Practical Chemistry – B.Sharma

பருவம்: மூன்றாம் பருவம்

பாடக் குறியீட்டு எண்: LT303S

அலகு பாடங்கள்

அலகு -1

- 1.1 சிலப்பதிகாரம் - வழக்குரை காதை
- 1.2 மணிமேகலை - பாத்திரம் பெற்ற காதை

அலகு - 2

- 2.1 சீவகசிந்தாமணி - கேமசரியார் இலம்பகம்
- 2.2 கம்பராமாயணம் - மந்தரை சூழ்ச்சிப் படலம்

அலகு - 3

- 3.1 பெரியபுராணம் - பூசலார் நாயனார் புராணம்
- 3.2 தேம்பாவணி - வளன் சனித்த படலம்
- 3.3 சீறாப்புராணம் - மானுக்குப் பிணை நின்ற படலம்

அலகு- 4 (இலக்கிய வரலாறு)

- 4.1 ஐம்பெருங்காப்பியங்கள்
- 4.2 கிறிஸ்துவக் காப்பியங்கள்
- 4.3 இசுலாமியக் காப்பியங்கள்
- 4.4 சோழர்காலக் காப்பியங்கள்
- 4.5 இரட்டைக் காப்பியங்கள்

அலகு - 5

- 5.1 பண்பலை வானொலி நிகழ்ச்சித் தொகுப்பு
- 5.2 வாடிக்கையாளர் சேவை மைய அலுவலர்
- 5.3 சுற்றுலா வழிகாட்டி
- 5.4 கடிதங்கள்
- 5.5 பொதுக்கட்டுரை

SEMESTER – III ENGLISH THROUGH LITERATURE –III LE303S**OBJECTIVES:**

1. To enable the students learn the art of communication through reading literature.
2. To enable them appreciate literary works.
3. To make them learn the relationship between Language & Literature.

UNIT- I SPORTS

1. Swami and Friends – R.K. Narayan (Prose)
2. See Off the Shine – Imogen Grosberg (Poem)
3. The Sporting Spirit – George Orwell (Prose)

UNIT-II MASS MEDIA

1. Building an Internet Culture – Philip Agre (Prose)
2. Odds against Us – Satyajit Ray (Prose)
3. TV as Babysitter – Jerzy Kosinski (Prose)

UNIT – III BASIC GRAMMAR

1. Agreement of the Verb with the subject
2. Non – Finite Verbs
3. Strong and Weak verbs
4. The Auxiliaries
5. Anomalous Finites

UNIT – IV BASIC LANGUAGE SKILLS

1. Paragraph Writing
2. Phonetic symbols, transcription (words)
3. Idioms & Phrases:
 - i. List of Idioms: An absent minded person, apple- pie order, an armchair critic, a big shot, a burning question, a cock and bull story, crocodile tears, a flying visit, laughing stock, asquare deal, a tall order, birds of a feather, fish out of water, the lion's share, storm in a tea cup.
 - ii. List of Phrases: Bear with, call on, call off, carry out, find out, give up, hand over, keep on, keep up, look after, set out, take over, turn down, wind up, work out.

SEMESTER – III INORGANIC CHEMISTRY-II CH305S

Unit I - Principles of Inorganic Qualitative Analysis and Types of Solvent (12 hrs)

- 1.1 Principles of acid-base equilibria - Common ion effect, solubility product and their applications in qualitative analysis. Reactions involved in the separation and identification of cations and anions in qualitative analysis – Spot reagents – aluminon, Cupferon, DMG, Thiourea, magneson, alizarin and Nessler's reagent.
- 1.2 Types of solvents: Physical properties of solvents, protic and aprotic solvents, amphiprotic and amphoteric solvents – aqueous and non aqueous solvents – Liquid NH_3 as a solvent - HF as a solvent-solvation number – medium effect - Vander waal's forces - ion-dipole-dipole interactions

Unit II - Carbon family and Types of Chemical reactions (12 hrs)

- 2.1. Carbon family: Group discussion - valencies, oxides, halides, hydrides of C and Si - catenation and hetero catenation – allotropy of carbon, comparison of properties of C & Si. Carbides: salt like carbides – Interstitial carbides – covalent carbides – applications of carbides in Industry.
- 2.2. Silicates: Ortho, pyro, cyclic, chain – pyroxenes and amphiboles, sheet silicates, 3D silicates. Silicones – synthesis – properties and uses.
- 2.3. Types of chemical reactions: Acid – Base, oxidation – reduction, electron transfer, double decomposition reaction – balancing chemical reactions by oxidation number and ion, electron method.

Unit III - Nitrogen and Oxygen family (12hrs)

- 3.1. Nitrogen and Oxygen group elements:
Nitrogen family - Comparative study of N, P, As, Sb, Bi oxides – N_2O_3 , P_4O_6 , N_2O_5 and P_4O_{10} . Oxoacids – HNO_2 , HNO_3 , H_3PO_2 , H_3PO_3 and H_3PO_4 – preparation and structure. Halides – NCl_3 , PCl_3 , PCl_5 – properties and structure. Hydrides – NH_3 , PH_3 , AsH_3 and BiH_3 – structure, trends in boiling point, basic character and hydrogen bonding. – preparation, properties, structure and uses of hydrazine, hydroxylamine.
- 3.2. Oxygen family: Comparative study of O, S, Se, Te elements – anomalous behavior of Oxygen, hydrides – H_2R type trend in melting point boiling point, bond angle and bond length. oxides – SO_2 and SO_3 . Oxoacids of sulphur – H_2SO_3 , H_2SO_4 and $\text{H}_2\text{S}_2\text{O}_7$ preparation, properties and structure. Peroxosulphuric acids- Caro's acid, Marshall's acid - preparation, structure and comparison – Dithionic and Polythionic acids. Chemistry of ozone.

Unit IV - Halogens and Noble gases (12hrs)

- 4.1. Halogens – Comparative study of F, Cl, Br, I, At elements – reactivities – comparison of fluorine with oxygen – hydrogen halides – preparation and properties of HF, HCl, HBr and HI – Bleaching powder, estimation of available of chlorine. Oxyacids of halogens – Sodiumhypochloride and Sodium chlorite – Poly halides - interhalogen compounds (ClF_3 , ICl , BrF_3 , ClF_5 , BrF_5 , IF_5 structure and properties) – Pseudo halogens (CN^- , SCN^- , N_3^- structure and properties). Basic properties of halogens - positive iodine – exceptional properties of fluorine, similarities between H_2O & HF.
- 4.2. Noble gases: electronic configuration – reasons for placing in zero group – position in the periodic table - chemical inertness of noble gases – reasons – applications – clathrates – hybridization and geometries of XeF_2 , XeF_4 , XeF_6 , XeOF_4 . Uses of noble gases.

Unit V - Chemistry of d-block elements and Metallurgical processes (12hrs)

- 5.1. Chemistry of d-block elements - Characteristics of d-block elements - occurrence - oxidation states, magnetic properties and color - comparative study of Ti, V, Cr, Mn & Fe group. Preparation and uses of $(\text{NH}_4)_2\text{MoO}_4$, V_2O_5 , UF_6 .
- 5.2. Metallurgical processes: Methods involved in ore concentration, isolation and purification. Metallurgy of Ti, V, W, Cr.

Text Books:

1. Vogals, Text book of quantitative chemical analysis, 6th Ed, PRENTICE HALL, 2000.
2. J.D.Lee, A New Concise Inorganic Chemistry, 3rd Edn., ELBS, 1987.
3. R.D.Madan, Modern Inorganic Chemistry , 3rd Edn., Sulthan Chand Publications, 1988.
4. W.V.Mallik, G.D.Tuli , R.D.Madan , Selected topics in Inorganic Chemistry, 4th Edn., Sulthan Chand Publications, 1992.
5. P.L.Sony & Mohan Katyal , Text book of Inorganic Chemistry , Sulthan Chand Publications, 1985.

Reference Books:

1. F.A.Cotton, G.Wilkinson, *Advanced Inorganic Chemistry*, 5th Edn., John Wiley, 1985.
2. B.Douglas, D.McDaniel, J.Alexander, *Concepts and Models of Inorganic Chemistry*, 3rd Edn., John Wiley, 2001.
3. J.E. Huheey, *Inorganic Chemistry*, 5th Edn., Harper International, 1993.

SEMESTER – III ANALYTICAL CHEMISTRY- II CH306

UNIT – I**[12 Hrs]****GRAVIMETRIC ANALYSIS**

Characteristics of precipitating agents- Choice of precipitants and conditions of precipitation – Specific and selective precipitants- Use of sequestering agents- Co-precipitation- Post precipitation- Peptisation- Differences- Reduction of error – Precipitation from homogeneous solution- Calculations in gravimetric methods- use of gravimetric factors.

Thermal Analytical Methods

Principle involved in thermogravimetric analysis and differential thermal analysis- Discussion of various components with block diagram- Characteristics of TGA&DTA- Factors affecting TGA & DTA curves- Thermometric titrations

UNIT II**SEPARATION AND PURIFICATION TECHNIQUES****[12 Hrs]**

Principles involved in the separation of precipitates- Purification of solid organic compounds- Crystallisation- Fractional crystallization- Sublimation- Purification of liquids- Experimental techniques of distillation- Fractional distillation- Vacuum distillation- Steam distillation- Electrophoresis.

UNIT III**POLAROGRAPHY****[12 Hrs]**

Principle – concentration polarization- dropping mercury electrode- advantages and disadvantages – convention- migration and diffusion currents- Ilkovic equation (derivation not required) and significance- experimental assembly- electrodes- capillary solutions- current voltage curve- oxygen wave- influence of temperature and agitation on diffusion layer- Polarography as an analytical tool in quantitative & qualitative analysis. **Amperometry** – basic principle & uses. **Polarimetry** principle- instrumentation- comparison of strengths of acids- Estimation of glucose.

Unit IV**UV- VISIBLE SPECTROSCOPY**

Absorption laws- calculations involving Beer – Lambert's law – instrumentation – photocalorimeter and spectrophotometer – block diagram with description of components with theory – types of electronic transitions – chromophore – auxochromes – absorption bands and intensity – factors governing absorption maximum and intensity.

X-Ray methods – Bragg's equation – explanation of terms – experimental methods – Rotating crystal technique – powder technique – determination of structure of NaCl.

Unit V**TECHNOLOGY OF WATER****[12 Hrs]**

Hardness of water – Hard water – soft water – Temporary and permanent hardness- problems on calculating temporary and permanent hardness – Estimation of hardness and their problems – Water treatment – lime soda process – calculation of amount of soda lime required for water softening – zeolite process – Demineralisation process – Reverse osmosis – Electrodialysis – biological oxygen demand – chemical oxygen demand - treatment of domestic water supply – sedimentation – coagulation – filtration – sterilization of water

Text Books:

1. R. Gopalan, P.S. Subramanian and K. Rengarajan “Elements of Analytical Chemistry”, 2nd edition (1991). Sultan Chand & sons educational publishers.
2. B. K. Sharma, “Instrumental Methods of Chemical Analysis” Seventeenth edition (1998) Goel publishing house, Meerut.
3. G. R. Chatwal, S. K. Anand “ Instrumental Methods of Chemical Analysis” Enlarged edition (2007) Himalaya publishing house Mumbai.
4. S. S. Dara, “ A Text Book of Engineering Chemistry” fifth revised edition (1996) S Chand company limited, New Delhi.

Reference Books:

A. Skoog and D. M. West, “Fundamentals of Analytical Chemistry”, International edition, seventh edition (1996), Saunders college publishing Philadelphia, Halt, London.

SEMESTER – III ALLIED PHYSICS APH301S**UNIT- I: PROPERTIES OF MATTER & ACOUSTICS (15 hours)**

Sound: Transverse vibrations of a stretched string- expression for the velocity of transverse wave – laws of transverse vibrations- A.C frequency measurement using sonometer- velocity of sound in a gas-Ultrasonics-production and uses.

UNIT- II: ELECTRICITY & MAGNETISM (15 hours)

Capacitor-energy of charged capacitors-loss of energy due to sharing of charges DC circuits – growth and decay of charge containing resistance and capacitor (RC) circuit & inductance and resistance (LR) circuit - -potentiometer-measurement of internal resistance of a cell and unknown resistances - Moment and pole strength of a magnet

UNIT- III: OPTICS (15 hours)

Physical Optics: Interference in thin films- Coherent sources- Interference in wedge shaped film- Newton's rings- Measurement of wave length and radius of curvature with theory- Air wedge - Theory of plane transmission grating- determination of wavelength of Hg lines by normal incidence

UNIT- IV: RELATIVITY & QUANTUM MECHANICS (15 hours)

Elements of relativity and Postulates of theory of relativity- Lorentz transformation equations- derivation- length contraction- time dilation- mass energy equivalence.
Quantum mechanics: De Broglie's waves - Uncertainty principle- postulates of wave mechanics- - Schrodinger's equation (one dimensional) - application to a particle in a box.

UNIT- V: ELECTRONICS (15 hours)

Basic electronics: PN Junction diode- transistor-characteristics of CE mode- Zener diode-voltage regulator- LED
Digital electronics: Boolean algebra- - verification AND, OR, NOT gates- construction using diodes and transistors- NAND- verification of Demorgan's theorem - ICs – SSI, MSI, LSI and VLSI.

Text Books

- 1.Principle of physics-Brijlal Subramaniyam
- 2.Allied physics-R.Murugesan.
- 3.Text book of sound- Brijlal Subramaniyam
- 4.Principle of Electronics-V.K.Metha.

SEMESTER – III ALLIED PRACTICAL APHP301

(Any TEN out of the FOURTEEN experiments can be selected)

1. Determination of Young's modulus –non-uniform bending -Pin and microscope.
2. Determination of Rigidity modulus- Torsional pendulum (without masses).
3. Determination of Rigidity modulus – Static torsion
4. Sonometer – verification of laws and frequency of tuning fork.
5. Sonometer – A.C frequency - Steel and Brass wire.
6. Air wedge – thickness of a wire.
7. Newton's rings – Determination of Radius of curvature
8. Spectrometer – Grating-Determination of wavelength of Hg lines.
9. Potentiometer – Calibration of Low range voltmeter.
10. Figure of merit of a galvanometer (Table galvanometer).
11. Construction of AND, OR NOT gates using diodes and transistors.
12. NAND gate as a universal gate.
13. Zener diode - Voltage regulation characteristics.
14. Field along the axis of a circular coil-deflection magnetometer- B_H and M.

SEMESTER-III FOOD PROCESSING TECHNOLOGY AOFT301

UNIT I: Aim and objectives of preservation and processing of foods – classification of foods by ease of spoilage – methods of food preservation – principles of food preservation – asepsis – removal of microorganisms – maintenance of anaerobic conditions.

UNIT II: (10hrs)

Preservation of food by use of high and low temperature. Factors affecting heat resistance (Thermal death time) – heat penetration – heat treatments employed in processing foods – canned foods – low temperature storage – chilling and freezing – freezing of foods and its consequences.

UNIT III: (10hrs)

Preservation of foods by drying, additives and radiation. Methods of drying – treatments of foods before drying – procedures after drying – intermediate moisture foods – antimicrobial preservatives – added preservatives – developed preservatives – Ultra violet radiation – ionizing radiations – gamma rays and cathode rays – microwave processing.

UNIT IV: (8hrs)

Food sanitation - Microbiology of the food product – good manufacturing practices – Hazard Analysis Critical Control Points – health of employees.

Food control – enforcement and control agencies – international agencies (FAO, WHO, FDA & ISO) – national agencies (Agmark, ISI, BIS).

UNIT V: (7hrs)

Food and food components – Food Adulteration – Food additives. - Dairy Technology. Market milk – Special milk - Cream – Butter – Ice Cream – Cheese – Dried milk products – Packaging of milk and milk products.

Text Books:: William C. Frazier., Dennis C. Westhoff, *Food Microbiology*, 1995 (Fourth Edition), Tata McGraw Hill, New Delhi.

Reference Books: Sukumar De, *Outlines of Dairy Technology*, 1991, Oxford University Press. A.Y. Sathe, *A First Course in Food Analysis*, 1999 New Age International (P) Limited, Publishers, New Delhi.

பருவம்: நான்காம் பருவம்

பாடக் குறியீட்டு எண்: LT404S

அலகு பாடங்கள்

- 1
 - 1.1 புறநானூறு – 74,192,312
 - 1.2 அகநானூறு – 02,07,34
 - 1.3 குறுந்தொகை – 23,38,40
 - 1.4 நற்றிணை – 149,60,110
 - 1.5 ஐங்குறுநூறு – வேட்கைப் பத்து (1-5)
 - 1.6 கலித்தொகை – பாலைக் கலி (9.11)

- 2
 - 2.1 பட்டினப்பாலை (120-192)
 - 2.2 சிறுபாணாற்றுப்படை
 - 2.3 மதுரைக்காஞ்சி
 - 2.4 முல்லைப்பாட்டு

திருக்குறள்

- 3
 - 3.1 அறிவுடைமை
 - 3.2 நட்பாராய்தல்
 - 3.3 புலவி நுணுக்கம்

இலக்கிய வரலாறு

- 4
 - 4.1 எட்டுத்தொகை,
 - 4.2 பத்துப்பாட்டு
 - 4.3 ஆற்றுப்படைகள்
 - 4.4 திருக்குறள் கீழ்க்கணக்கில் பெறுமிடம்

மொழித்திறன்

- 5
 - 5.1 விண்ணப்பங்கள்
 - 5.2 சுருக்கி வரைதல்
 - 5.3 நேர்காணல்

SEMESTER – IV ENGLISH THROUGH LITERATURE –IV LE404S

OBJECTIVES:

1. To enable students be aware of career prospects.
2. To make them prepare for their career.
3. To introduce students to the realm of fiction with special emphasis on character study.

UNIT- 1 SELECTED SCENES FROM SHAKESPEARE

- i. HE KILLS SLEEP
MACBETH
Act One Scene VII and Act Two Scene II
- ii. PLAY OUT A PLAY??
HENRY IV PART I
Act Two Scene IV
- iii. PATTERNS OF LOVE
AS YOU LIKE IT
Act Four Scene I

UNIT- II POETRY

1. The Road Not Taken – Robert Frost
2. La Belle Dame Sans Merci – John Keats
3. Punishment in Kindergarten- Kamala Das

UNIT- III SHORT STORY

1. The Purple Dress – O’Henry
2. Chameleon – Anton Chekhov
3. The Reaping Race- Liam o’ Flaherty

UNIT- IV

1. Phonetic Transcription (Sentences)

UNIT- V Basic Grammar

1. Use of wrong prepositions
2. Unnecessary use of Articles.
3. Use of wrong Tenses
4. Punctuation & Capitals
5. The uses of prefixes & suffixes

Text

1. ***Selected scenes from Shakespeare's plays.*** ed., Board of Editors. Chennai: Emerald publishers, 2002.
2. Mohanty P.K and Mahapatra, S. ***An Anthology of Short Stories.*** New Delhi: S. Chand & Company Ltd, 1997.
3. Ambika Sen Gupta. ***Selected College Poems,*** Madras: Orient Longman, 1994.
4. O' Conor, J.D. ***Better English pronunciation.*** New Delhi: Cambridge UP
5. ***Popular Short Stories*** ed. Board of Editors. Chennai: Oxford UP, 1998.

Reference

1. Krishnasamy, N& Sriraman T. ***Creative English for Communication.*** Chennai: Macmillan, 2006.
2. Burton, S.H: Macmillan Master Series, Macmillan.
3. Jones, Daniel. ***English Pronouncing Dictionary.*** Singapore: Cambridge UP, 2006.

SEMESTER – IV ORGANIC CHEMISTRY – II CH407

UNIT – I ALIPHATIC NUCLEOPHILIC SUBSTITUTION

12 hrs.

- 1.1 Nucleophiles – Nucleophilicity
- 1.2 Aliphatic nucleophilic substitution – Mechanisms of SN1, SN2 and SNi. Energy Profile diagrams – Effects of nature of substrates, solvent, nucleophile and Leaving groups. Leaving group ability and pKa value. Basicity and Nucleophilicity – a comparison.
- 1.3 Substitution Vs elimination – with examples.
- 1.4 Stereochemistry of Substitution reactions – a brief introduction.

Unit – II AROMATIC ELECTROPHILIC & NUCLEOPHILIC SUBSTITUTION.

12hrs.

- 2.1 Aromaticity – Huckel's theory of aromaticity and its applications to Benzene and polynuclear hydrocarbons like naphthalene.. Resonance and delocalization in benzene. Examples of aromatic, anti-aromatic and non-aromatic compounds. Problems.
- 2.2 Aromatic electrophilic substitution. Mechanisms of Nitration, halogenation, Sulfonation. Friedel – Crafts alkylation and acylation. Substituent effects in Aromatic electrophilic substitution. Reactivity and orientation. Activation and Deactivation of the benzene ring. Ortho – para ratio. Problems.
- 2.3 Synthesis of simple substituted benzenes using the above reactions.
- 2.4 Aromatic nucleophilic substitutions. The addition – elimination mechanism AdE2. The elimination – addition mechanism - Benzyne mechanism.

Unit – III : ALCOHOLS ,ETHERS & PHENOLS

12 hrs.

- 3.1 Alcohols – Sources – Nomenclature – Preparation by reduction of aldehydes, Ketones, acids and esters. Preparation using Grignard reagents. Types of Alcohols and their reactivity. Diols and polyhydric alcohols.
- 3.2 Reactions of alcohols – oxidation, esterification and dehydration. Cleavage of Diols using periodic acid (HIO_4) and lead tetraacetate.
- 3.3 Allyl alcohol – its preparation. Allylic substitution using N-bromosuccinimide (NBS).
- 3.4 Phenols – Nomenclature – structure and bonding. Sources of phenols – acidity of phenol and substituent effects on its acidity. Reactions of phenols: Reimer-Tiemann, Kolbe-Schmidt, Lederrer-Manasse reactions And coupling with diazonium salts. Problems
- 3.5 Ethers – Nomenclature – structure and bonding – Preparation – Williamson synthesis. Cleavage of ethers by acids.

UNIT –IV: ALDEHYDES AND KETONES

- 4.1 Nomenclature and classification
- 4.2 Preparation of aldehydes and ketones
- 4.3 Reactivity of carbonyl groups , acidity of alpha hydrogen.
- 4.4 Reactions: Mechanism of enolisation reactions, nucleophilic addition , oxidation and reduction reactions, addition reactions with Grignard reagents, cyanide and bisulphate, preparation of derivatives of ammonia and alcohols, Cannizaro reaction and aldol condensation.
- 4.5 Mechanism of aldol, perkin, knoevenagel reactions and benzoin condensation, Claisen, Wittig and Reformasky reactions.
- 4.6 Mechanisms of reductions with NaBH_4 , LiAlH_4 , Wolff- Kishner and MPV reductions.
- 4.7 Basic principles of photochemistry, Joblanski diagram, Photochemical reactions of carbonyl compounds: Norrish type – I and II reactions

UNIT – V CARBOXYLIC ACIDS

12 hrs.

- 5.1 Carboxylic acids – nomenclature.
- 5.2 Ionization of carboxylic acids – acidity constants
- 5.3 Comparison of acid strengths of substituted haloacids and substituted benzoic acids.
- 5.4 Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction.
- 5.5 Conversion of acids to their derivatives.
- 5.6 Dicarboxylic acids – nomenclature.
- 5.7 Preparation and properties of oxalic, malonic, succinic, glutaric and adipic acids

Text Books :

1. Francis A. Carey, - Organic Chemistry- Tata McGraw Hill-1999.
2. Seyhan Ege- Organic Chemistry-A.I.T.B.S Publishers-1999.

Reference Books:

1. Ahluwalia and Parassar- Organic Reaction mechanisms, Narosa Publishers.2004.
2. Bahl & Arun Bahl- Advanced Organic Chemistry, Sultan Chand-1996.
3. Paula Yurkanis Bruice - Organic Chemistry, Prentice Hall- 1999.
4. E.L. Eliel and S.H. Wilers , Stereochemistry of Organic Compounds , John Wiley and sons , 2004.
5. P.S.Kalsi , Stereochemistry : Conformation and Mechanism , Wiley Eastern Ltd -2007.

SEMESTER – IV Introduction to molecular structure CH408S**UNIT – I****(12 hrs)**

- 1.1 Quantum Chemistry – the failures of classical physics-block body radiation – Photo electric effect – diffraction of electrons-atomic and molecular spectra.(Pages 270-279)
- 1.2 .Schrodinger equation –the Born interpretation-uncertainty principle.(Pages 280-283)
- 1.3 Quantum numbers- wave functions –s orbitals-p and d orbitals-electron spin-spectral transitions and selection rules. (Pages 301-309)

UNIT – II**(12 hrs)**

- 2.1 Chemical bond-classification of bonds-potential energy curves-VBT-diatomic molecules-polyatomic molecules-promotion and hybridization-resonance.(Pages 326-332)
- 2.2 Molecular orbitals-linear combinations of atomic orbitals- bonding orbitals -anti bonding orbitals-structure of diatomic molecules- hydrogen and helium molecules.(Pages 334-338)

UNIT – III

- 3.1 Electric and magnetic properties – Clausius-Mosotti equations – Debye equation – measurement of dipole moments – dependence of polarizability on frequency.
- 3.2 Molar refractivity – dipole moments and molecular structure – magnetic permeability – magnetic susceptibility – diamagnetism – Para magnetism – measurement of magnetic susceptibility

UNIT-IV

- 4.1 Group theory – symmetry operations – products of symmetry operations –classes and sub groups – group multiplication table – properties of a group -point groups – C_{2v} , C_{3v} , C_{2h} , D_{4h} , D_{2h} , D_{3h} , T_d , O_h , $C_{\infty v}$, $D_{\infty h}$ (any one example for each) – character table – Great orthogonality theorem – applications of Group theory.

UNIT-V

- 5.1 General features of spectroscopy- experimental techniques-intensities and line widths
- 5.2 Rotational spectroscopy-the rotational energy levels of molecules-rotational transitions-microwave spectroscopy-rotational Raman spectra.
- 5.3 Vibrational spectroscopy – the vibrations of molecules –transitions- vibrational Raman spectra of diatomic molecules-vibrations of polyatomic molecules and vibrational Raman spectra of polyatomic molecules.
- 5.2 Electronic transitions – UV and visible spectra –Franck Condon principle-measures of intensity-circular dichroism- types of transitions. (Pages 415-446)

Text Book

P.W. Atkins.Elements of Physical chemistry. Oxford university Press.3rd edition.1990.

Further reading

K.V.Raman. Group theory. 1996. (5th edition)

Puri and Sharma. Principles of physical chemistry. 40th edition.2003

R. K. Prasad, Quantum Chemistry, Wiley Eastern, New Delhi, 2nd edition,1992.C.N Banwell, fundamentals of molecular spectroscopy, Chapman and hall 4th edition,1991.

SEMESTER – IV ACCH401 ALLIED – COMPUTER IN CHEMISTRY

St. Joseph's College, Cuddalore.

SEMESTER – IV ENVIRONMENTAL STUDIES EVS401

Unit I : Environmental studies and Natural resources (20 Hrs)

Definition, scope and importance of environmental studies – forest resources: deforestation, mining, dams – water resources: over – utilization, floods, drought – mineral resources: exploitation, extraction and usage – food resources: food problems, overgrazing, pesticide problems, water logging, salinity – energy resources: energy needs, renewable and non renewable energy – land resources: land degradation, landslides, soil erosion and desertification – conserving natural resources.

Unit II: Ecosystems : (20 Hrs)

Concept, structure and function of an ecosystem – producers, consumers and decomposers – energy flow – ecological succession – food chains, food webs and ecological pyramids – types, characteristics, structure and function of forest ecosystem, grassland ecosystem, desert ecosystem and aquatic ecosystem

Unit III: Biodiversity: (20 Hrs)

Definition of biodiversity – genetic, species and ecosystem diversity – value of biodiversity – India as a mega diversity nation – hot spots – threats to biodiversity – endangered and endemic species of India – In-situ and Ex-situ conservation of biodiversity.

Unit IV: Environmental Pollution: (20 Hrs)

Cause, effects and control measures of air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution and nuclear hazards – solid waste management: causes, effects, control measures and disposal of wastes – disaster management: floods, earthquakes, cyclone, land slides and tsunami.

Unit V: Social Issues, Human population and the Environment: (20 Hrs)

Water conservation, rain water harvesting, watershed management – environmental ethics: issues and possible solution – climate change, global warming, acid rain, ozone depletion, nuclear accidents and holocaust – wasteland reclamation – Environment protection Act – Wildlife protection Act – Forest Conservation Act – public awareness – Population explosion – Environment and human health – Role of Information Technology in Environment and human health.

Field work: (20 Hrs)

1. Visit to a local area to document environmental assets – river / forest / grassland/mangrove.
2. Visit to a local polluted site – urban / rural / industrial / agricultural.
3. Study of common plants, insects, birds.
4. Study of simple ecosystems – pond, river, forest, etc.,
5. Practical work

Reference Books:

1. Joseph C.Daniel,2004. Principles of Environmental Science. Brightson's Publications,Chennai.
2. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner. 3. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad - 380 013, India, Email:mapin@icenet.net
4. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi
5. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co.
6. Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA,
7. Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut 8. Trivedi R.K., Hand book of Environmental Laws, Rules Guidelines, Compliances and Standards. Vol I and II, Enviro Media9.Wanger K.D., 1998. Environmental Management. W.B. Saunders Co. Philadelphia, USA

SEMESTER – IV QUALITATIVE ORGANIC ANALYSIS PRACTICAL CHP403**ORGANIC ANALYSIS**

Identification of an organic compound through the functional group analysis.
Detection of special elements (N,S and halogens).(Micro scale)

ORGANIC PREPARATIONS

1. NITRATION: Preparation of m-dinitrobenzene and p-nitroacetanilide.
2. ACETYLATION : Preparation of acetyl derivatives of aniline, salicylic acid and glucose.
3. DIAZOTIZATION: Preparation of methyl orange and methyl red.
4. REDUCTION: Preparation of aniline from nitrobenzene.
5. OXIDATION : Preparation of benzoic acid from benzaldehyde.
6. HALOGENATION: Preparation of p-bromoacetanilide.

Reference books:

1. Mann and Saunders,Laboratory manual of Organic Chemistry.
2. Vogel's Quantitative Organic Analysis.

SEMESTER – IV PHYSICAL METHODS PRACTICAL CHP404**Part -I****Determination of melting point**

Naphthalene, Benzoic acid, Urea, Succinic acid, m-Dinitrobenzene
Acetanilide, p-Dichlorobenzene.

Determination of boiling point

Ethanol, Cyclohexane, Toluene

Part - II**Decolorisation and crystallization using Charcoal**

1. Decolorisation of brown sugar (sucrose) with animal charcoal using gravity filtration.
2. Crystallization and decolorisation of impure naphthalene from ethanol.

Part - III**Viscosity, Surface Tension**

1. To determine the percentage composition of a given mixture by viscosity method.
2. To determine the percentage composition of a given binary mixture by surface tension method.
3. To determine the viscosity of amyl alcohol in water at different concentrations.

SEMESTER – V ORGANIC CHEMISTRY – III CH509

Unit I Nitrogen containing compounds (12 Hrs)

- 1.1 Nomenclature and classification, Preparation
- 1.2 Nitrocompounds: aliphatic and aromatic nitro compounds, classification, general properties.
- 1.3 Reactions: reduction by chemical and electrolytic method
- 1.4 Di- and tri-substitution of aromatic nitro compounds: synthesis of o-, m-, p- dinitrobenzenes and trinitrobenzene.
- 1.5 Aromatic amines. Preparation of primary, secondary and tertiary amines.
- 1.6 Reactions: basicity of amines, effect of substituents on basicity of aromatic amines.
- 1.7 Diazonium salts: Preparation, diazotization reaction, Sandmeyer, Gatterman and Gomberg, coupling reactions.

Unit II Stereochemistry – II (12 Hrs)

- 2.1 Optical isomerism, optical activity, optical and specific rotations, conditions for optical activity. Asymmetric center, chirality, achiral molecules, (+) and (-) and D and L notations, elements of symmetry, racemization, methods of racemization, methods of resolution, asymmetric synthesis (partial and absolute synthesis), Walden inversion.
- 2.2 Projection formula: Fischer, flying wedge, sawhorse and Newmann projection formulae – notation of optical isomers – Cahn-Ingold-Prelog rules, R and S notations for optical isomers with one two asymmetric carbon atoms, erythro and threo representations.
- 2.3 Optical activity in compounds not containing asymmetric carbon atoms namely biphenyls, allenes and spiranes.

Unit III Synthesis involving active methylene group (12 hrs)

- 3.1 Carbonyl polarization – reactivity – acidity of alpha hydrogen- malonic – acetoacetic and cyanoacetic esters – characteristic reactions of active methylene group – synthetic uses of malonic, aceto acetic and cyano acetic esters.
- 3.2 Diazomethane and diazoacetic ester: Preparation, structure and synthetic applications.
- 3.3 Tautomerism: Definition- keto-enol tautomerism- identification, acid and base catalyzed mechanisms, evidences – amido – imidol and nitro- acinitro tautomerisms

Unit IV Molecular Rearrangements (12 Hrs)

- 4.1 Classification as anionotropic, cationotropic, free radical, inter and intramolecular rearrangement
- 4.2 Pinacol-pinacolone rearrangement – mechanism, evidence for carbonium ion intermediate formation – migratory aptitude
- 4.3 Beckmann, Hoffmann, Curtius and Benzillic acid, Baeyer Villiger rearrangements.
- 4.4 Claisen rearrangement (evidence for intramolecular nature and allylic carbon attachment) – Para Claisen, Cope and oxycope rearrangements and Fries rearrangement (two mechanisms)

Unit V Carbohydrates and amino acids (12Hrs)

- 5.1 Carbohydrates : Structural elucidation of glucose and fructose – pyranose and furanose forms – determination of ring size – Haworth projection formula – epimerization reactions of glucose and fructose – Osazone formation, mutarotation and its mechanism – chain lengthening and chain shortening of aldoses – inter conversion of aldoses and ketoses.
- 5.2 Structural elucidation of sucrose and maltose. Structure and properties of starch and cellulose.
- 5.3 Amino acids : Classification and structure of amino acids – Gabriel phthalimide synthesis – Strecker synthesis – Erlenmeyer synthesis – Zwitter ion, isoelectric point – peptide – Merrifield synthesis – End group analysis – Proteins – primary, secondary and tertiary structure of proteins.

Text Books:

1. R. T. Morrison and R. N. Boyd, *Organic chemistry*, 6th edition, Prentice Hall of India Limited., New Delhi, 1992.
2. B. Y. Paula Yurkanis Bruise, *Organic Chemistry*, 3rd edition, Pearson education, New Delhi 2002.
3. I. L. Finar, *Organic chemistry*, 6th edition, ELBS, 1990.
4. O. P. Agarwal, *Chemistry of organic natural products* vol 1, Goel publishing house, 2002.
5. Gurdeep chatwal, *Chemistry of organic natural products*, vol 1, Goel publishing house, 2002.
6. B. S. Bahl and Arun Bahl, *Organic chemistry*, S. Chand and Sons, New Delhi, 2005.

Reference Books:

1. Jerry March, *Advanced organic chemistry*, 4th edition, John wiley and sons, New Yorkk, 1992.
2. S. H. Pine, *Organic chemistry*, 5th edition, Mcgraw Hill international edition chemistry series, New York, 1987.
3. Seyhan. N. Ege, *Organic chemistry, structure and reactivity*, 3rd edition, A.I.T.B.S., New Delhi, 1998.
4. P. S. Kalsi, *Stereochemistry: Conformation and Mechanism*, 2nd edition, Wiley easern ltd, 1993.

SEMESTER – V INORGANIC CHEMISTRY – III CH510S**UNIT I - Co-ordination Chemistry I****[12 Hrs]**

- 1.1. Co-Ordination Chemistry: Definition of terms used - Nomenclature of Co-ordination complexes - Classification of ligands - applications of EDTA.
- 1.2. Isomerism in complexes – ionization isomerism, hydrate isomerism, linkage isomerism, ligand isomerism, Co-ordination isomerism and polymerization isomerism - Geometrical and optical isomerism in four and six coordinated complexes.

UNIT II - Co-ordination Chemistry II**[12 Hrs]**

- 2.1. Werner's theory - Sidgwick's theory - EAN rule, - Valence bond theory – hybridization - geometry and magnetic properties - failure of VBT.
- 2.2. Crystal field theory - Splitting of d-orbitals in octahedral, tetrahedral and square planar complexes - crystal field stabilization energy - calculation of CFSE in octahedral complexes - Spectrochemical series - low spin and high spin complexes - explanation of magnetic properties and color of complexes using CFT - Trans effect and Jahn-Teller effect.

UNIT-III - Co-ordination Chemistry III**[12 Hrs]**

- 1.1. Comparison of VBT and CFT. Applications of coordination compounds in qualitative and quantitative analysis - Detection and separation of Cu & Cd ions, Estimation of Ni using DMG and Al using oxine.
- 1.2. Pi - Acceptor ligands, bonding, hybridizations, structures and properties of carbonyls of Ni, Cr, Fe, Co, Mn, W & V.

UNIT IV - Co-ordination Chemistry IV**[12 Hrs]**

- 4.1. Thermodynamic and kinetic aspects of metal complexes.
- 4.2. Stepwise and overall formation constant, trends in stepwise constant, factors affecting the stability of metal complexes with reference to nature of metal ion and ligand, chelate effect and its thermodynamics origin - Determination of stability constants by potentiometric, and spectrophotometric techniques.

UNIT V - Solid State Chemistry**[12 Hrs]**

- 5.1. X-Ray diffraction – Bragg's equation - principle of X-ray diffraction - comparison of X-ray, electron and neutron diffraction - Identification of simple cubic lattices using XRD techniques.
- 5.2. Radius ratio and coordination number of Crystal structure – NaCl, Rutile, Wurtzite, Zincblende and CaF₂, - Crystal defects – Schottky, Frenkel, Metal excess and Metal deficiency defects, and their consequences. Metallic bond, Metallic properties, Band theory of metals, semiconductors - n and p type semiconductors - Superconductors.

Text Books

1. R. Gopalan,; V.Ramalingam, Concise Co-ordination Chemistry, 2nd Ed, Vikas publishing house, 2008.
2. R. Gopalan, . Inorganic Chemistry For Undergraduates, university press pvt ltd, 1st ed, 2009.
3. B.R. Puri,; L.R.Sharma,; K.C.Kalia, Principles of Inorganic Chemistry, Lal Nagin chand and co. Delhi 1996.
4. J. D. Lee, Concise Inorganic Chemistry, 5th ed, Blackwell science, London 1996.
5. L. E. Smart, E. A. Moore, Solid State Chemistry – An introduction 3rd ed, Taylor and Francis group 2005.

Reference Books:

1. W. R. West, Solid State Chemistry And Its Applications, John Wiley and Sons, New York, 1984.
2. W. L. Jolly, Modern Inorganic Chemistry, 2nd ed, Mc-Graw Hill 1991.
3. J.E.Huheey,; E.A.Keiter,; R.L.Keiter, Inorganic Chemistry Principles of Structure and Reactivity, 4th ed, Harper and Collins 1993.

SEMESTER – V Equilibrium Thermodynamics of gaseous systems CH511S**Unit I [12 Hrs]**

- 1.1 Thermodynamics-the conservation of energy-systems and surroundings-work and heat- the measurement of work- the measurement of heat.
1.2 Internal energy –enthalpy- the temperature variation of the enthalpy. (Pages 37-56)

Unit II [12 Hrs]

- 2.1 Thermo chemistry-physical change-the enthalpy of phase transition-atomic and molecular change.
2.2 chemical change – standard enthalpy changes- the combination of reaction enthalpies-standard Enthalpies of formation –variation of reaction enthalpy with temperature. (Pages 57-76)

Unit III [12 hrs]

- 3.1 II law of thermodynamics- entropy –The carnot Cycle – carnot theorems – Entropy and carnot cycle – Entropy a measure of randomness and probability.
3.2 Direction of spontaneous change-entropy and II law-entropy changes for typical processes- entropy changes in the surroundings. (Pages 77-85)

Unit IV [12 hrs]

- 4.1 III law of thermodynamics- Nernst heat theorem- Gibbs-Duhem equation-effect of temperature and pressure on chemical potential – chemical potential in systems of ideal gases- Duhem- Margules equation. Absolute entropies – standard reaction entropy.
4.2 the spontaneity of Chemical reactions –Gibbs free energy – focusing on the system properties of the Gibbs energy. (Pages 77-90)

Unit-V

- 5.1 Phase equilibria-thermodynamics of transition –condition of stability- variation of Gibbs energy with pressure- variation of Gibbs energy with temperature.
5.2 Phase diagrams –phase boundaries-location of phase boundaries-characteristic points - Phase rule – phase diagram for typical materials. (Pages 95-110)

Text Book

P.W. Atkins.Elements of Physical chemistry. Oxford university Press.3rd edition.1990.

Further reading

1. J.Rajaram and J.C.Kuriacose,Thermodynamics For Students of Chemistry,Lal Nagin Chand,New Delhi, 3rd edition, 1986.
2. Puri and Sharma. Principles of physical chemistry. 40th edition.2003
3. Arun Bahl, B.S.Bahl and G.D. Tuli . Essentials of Physical Chemistry. 26th edition (revised multicolour). 2009.

SEMESTER – V ANALYTICAL TECHNIQUES ECH512

UNIT-I

- 1.1. **Introduction:** Introduction to instrumental methods of chemical analysis.
- 1.2. **Microwave spectroscopy:** Introduction–instrumentation–the source and monochromator–sample and sample space–detector–spectrum analyzer–working.
- 1.3. **IR-spectroscopy:** Introduction – source - monochromators – sample cells & sampling substances – sampling of solids – detector – bolometers – thermocouples – thermistars – golay cell – photoconductivity cell – single beam & double beam spectrometers.

UNIT-II

- 2.1. **Raman spectroscopy:** Introduction – instrumentation – source of light – filters – sample holder – spectrograph
- 2.2. **UV spectroscopy:** Introduction–instrumentation–radiation source – monochromators–detectors–recording system–sample cells–power supply
- 2.3. **NMR spectroscopy:** introduction - instrumentation – sample holder – magnet – sweep generator – radio frequency generator – radio frequency receiver.

UNIT-III

- 3.1. **NQR spectroscopy:** Introduction – Instrumentation
- 3.2. **ESR spectroscopy:** Introduction – instrumentation – source – circulator – sample cavity – magnet system – crystal detectors
- 3.3. **Mass spectroscopy:** Introduction – instrumentation – inlet system – ion source – electrostatic accelerating system – ion collector – vacuum system

UNIT-IV

- 4.1. **Massbauer spectroscopy:** Introduction – instrumentation
- 4.2. **Atomic absorption spectroscopy:** Introduction – instrumentation –radiation source – chopper – production of the atomic vapor – nebulisation of the liquid sample – monochromators – detectors – amplifiers
- 4.3. **Flame photometry:** Introduction –instrumentation – burner – mirrors – monochromators – filters - detectors

UNIT-V

- 5.1. **Nephelometry and Turbidimetry:**
Introduction – instrumentation – sources – detectors – cells – turbidimeters - nephelometers
- 5.2. **pH meter:** Introduction – instrumentation – potentiometric type – direct reading type
- 5.3. **Fluorimetry and Phosphorimetry:** Introduction – instrumentation – flourimeters & spectrofluorimeters

Text Books:

1. Instrumental methods of chemical analysis; Chatwal & Anand, Himalaya publishing House.
2. R. Gopalan, Analytical chemistry, S. Chand & Co., New Delhi, 2002.
3. D. A. Skoog; D. M. West; F. J. Holler, Analytical chemistry: An introduction, 5th edition, Saunders college publishing, Philadelphia, 1990.

Reference Books:

1. A. K. Srivastava, P. C. Jain, Chemical Analysis – an instrumental approach for B. Sc., honors and M.Sc., classes, S. Chand & company Ltd., Ram Nagar, New Delhi.
2. R. M. Roberts, J. C. Gilbert, L. B. Rodewald, A. S. Wingrove, Modern experimental chemistry, 4th edition, Holt Saunders international edition.

SEMESTER – V CHEMISTRY OF INDUSTRIAL PRODUCTS ECH513**UNIT-I SOAPS AND DETERGENTS**

- 1.1 Saponification of oils and fats – Manufacture of soaps – Formulation of Toilet soaps–Different ingredients used–Their functions–Medicated soaps. Herbal soaps–Mechanism of action of soap–Soft soaps–Shaving soaps and creams–ISI specifications–Testing procedures and limits.
- 1.2 Anionic detergents: Manufacture of LAB (Linear Alkyl Benzene) – Sulphonation of LAB – preparation of acid slurry–Different ingredients in the formulation of detergent powders and soaps–Liquid detergents–Foam boosters–AOS (alpha olefin sulphonates).
- 1.3 Cationic detergents: Examples– Manufacture and applications.
- 1.4 Non-ionic detergents: Examples–Manufacture of ethylene oxide condensate.
- 1.5 Mechanism of action of detergents: Comparison of soaps and detergents– Biodegradation – environmental effects – ISI specifications and limits.

UNIT- II SHAMPOOS AND DYES.

- 2.1 Manufacture of SLS and SLES: Ingredients–Functions–Different kinds of shampoos – anti-dandruff–anti-lice–herbal and baby shampoos.
- 2.2 Hair dye: Manufacture of conditioners – Coco betaines or coco diethanolamides – ISI specifications – Testing procedures and limits.
- 2.3 Introduction: Methods of dyeing – Classifications of dyes – Methods of application of dyes – Fluorescent brightening agent – non-textile uses of dyes

UNIT-III SKIN PREPARATIONS.

- 3.1 Face and skin powders: Ingredients – functions – Different types – Snows and face creams – A chemical ingredients used – Anti perspirants.
- 3.2 Sun screen preparation: UV absorbers – Skin bleaching agents – Depilatories – Turmeric and neem preparations – Vitamin oil.
- 3.3 Nail polishes: Nail polish preparation – Nail polish removers – Article removers – Lipsticks – roughes, eyebrow pencils – Ingredients and functions – hazards – ISI specifications.

UNIT-IV LEATHER & SUGAR CHEMISTRY, AGRICULTURAL CHEMISTRY

- 4.1 Introduction: Manufacture of leather–Preparation of hides for tanning– Vegetable–chrome and oil tanning–tannery effluents–pollution control.
- 4.2 Introduction– manufacture of cane sugar– recovery of sugar from molasses–manufacture of sucrose from beet root–testing and estimation of sugar.
- 4.3 Classification and examples for insecticides, fungicides and herbicides –fluorine compounds, boron compounds, arsenic compounds, mercuric compounds, pyridine compounds – ill effects of use of chemical fertilizers and insecticides.

UNIT-V LUBRICANTS, EXPLOSIVES AND PROPELLANTS.

- 5.1 Mechanism of lubrication: Classification of lubricants–lubricating oils– greases or semi solid lubricants– solid lubricants and synthetic lubricants.
- 5.2 Explosives: Classification of explosives, primary explosives–high explosive and low explosive. Blasting fuses–manufacture of important explosives–propellants and rocket fuels–classification of propellants and uses.

Text Books:

1. Gobala Rao. S, Outlines of chemical technology, Affiliated East West Press, 1998.
2. Kafaro, Wasteless chemical processing, Mir Publishers, 1995.

Reference Books:

1. Sawyer. W, Experimental cosmetics, Dover publishers, New York, 2000.

SEMESTER – V PHYSICAL CHEMISTRY CHP505

1. Distribution law:

- a) Partition coefficient of Benzoic acid between water and benzene.
- b) Distribution coefficient of Iodine between water and CCl_4 .

2. Kinetics:

- a) Acid catalyzed hydrolysis of an ester (methyl or ethyl acetate).
- b) Saponification of an ester (methyl or ethyl acetate).
- c) Iodination of acetone.

3. Colligative properties:**Rast's method:**

- a) Determination of molecular weight of a solute – using naphthalene or diphenyl as solvents.

Solutions:

- a) Determination of activity and activity coefficient from freezing point depression method.
- b) Construction of temperature - composition curves for Azeotropic mixtures.
 - (i) Intermediate deviation
 - (ii) Maximum deviation
 - (iii) Minimum deviation

4. Heterogeneous Equilibria:

- a) Phenol – water system – CST
- b) Effect of impurity – 2% NaCl or succinic acid solutions on phenol water system – determination of the concentration of the given solution.

5. Determination of the transition temperature of the given salt hydrate:

$\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$, $\text{CH}_3\text{COONa} \cdot 3\text{H}_2\text{O}$, $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$, $\text{MnCl}_2 \cdot 4\text{H}_2\text{O}$.

SEMESTER – V GRAVIMETRIC ESTIMATION CHP506

1. Estimation of Sulphate as barium sulphate.
2. Estimation of Barium as barium sulphate.
3. Estimation of Barium as barium chromate.
4. Estimation of Lead as lead chromate.
5. Estimation of Calcium as calcium oxalate monohydrate.

St. Joseph's College, Cuddalore.

SEMESTER – V ANALYTICAL CHEMISTRY CHP507S

1. Chromatography:

- a) Thin – layer chromatography.
- b) Column chromatography.

2. Conductometry:

- a) Determination of strength of strong acid (HCl Vs NaOH).
- b) Verification of Onsager's equation.
- c) Determination of strength of mixture of acids (HCl + CH₃COOH Vs NaOH).

3. Potentiometry:

- a) Determination of single electrode potential.
- b) Determination of pK_a of weak acid using std. NaOH solution.

4. Colorimetry:

Determination of unknown concentration using Photoelectric colorimeter.

5. pH meter:

Determination of pK_a of acetic acid.