GENERAL TAMIL - III

பாடவேளை - 120 மணிகள் **SUBJECT CODE:**

பொதுநோக்கம்:

1. இக்கால இலக்கியங்களின் சிறப்பினை அறிந்து கொள்ளல்
2. தொடர்நிலைச் செய்யுளில் கூறப்பட்ட நயத்தை புரிந்துகொள்ளல்
3. சமயப்புலவர்கள் இயற்றிய புராணங்களின் பொருளினை அறிந்து கொள்ளல்.
4. காப்பியங்களின் வழிக் கூறப்படும் நடைமுறைத் தத்துவத்தை பயன்படுத்தல்.
5. கட்டுரை, அறிக்கை எழுதும் திறன் வளர்த்தல்.

அலகு - 1

சிலப்பதிகாரம்	-	கொலைக்களக் காதை
மணிமேகலை	-	ஆதிரை பிச்சையிட்ட காதை

அலகு - 2

சீவகசிந்தாமணி	-	கேமசரியார் இலம்பகம்.
கம்பராமாயணம்	-	குகப்படலம்.

அலகு - 3

பெரியபுராணம்	-	கண்ணப்பநாயனார்.
தேம்பாவணி	-	வளன் சளித்த படலம்.
சீறாப்புராணம்	-	மானுக்குப் பிணை நின்ற படலம்.

அலகு - 4

இலக்கியவரலாறு - ஐம்பெருங்காப்பியம்
இரட்டைக் காப்பியம்
சோழர்காலக் காப்பியங்கள்.
சைவ, வைணவபக்தி இலக்கியங்கள்.
சமணர், பௌத்தர் தமிழ்த் தொண்டு.

அலகு - 5

கட்டுரைகல் - கம்பலைமானுடம் - சிற்பி பாலசுப்பிரமணியம், வானதி பதிப்பகம், சென்னை – 600 017.

அலகு - 6

பண்பலை வானொலி நிகழ்ச்சித் தொகுப்பு.
சுற்றுலா வழி காட்டிப் பயிற்சி முறைகள்.
பொதுக் கூட்டம் (அ) விழாவில் குறிப்பு எடுத்தல்.

பார்வை நூல்கள்:

1. டாக்டர்.உ.வே.சா. (2008), சிலப்பதிகாரம், சென்னை: டாக்டர் உ.வே.சா பதிப்பகம்.
2. புலியூர்க்கேசிகன், (2010), மணிமேகலை, சென்னை: செண்பகா பதிப்பகம்.
3. பள்ளத்தூர் பழ. பழனியப்பன்(2015), கம்பராமாயணம், சென்னை: வானதி பதிப்பகம்.
4. ஷெரீப்.மு.(1992) சீறாப்புராணம், சென்னை: சீதக்காதி நூல் வெளியீட்டகம்.
5. நச்சினார்க்கினியர், (1987) சீவகசிந்தாமணி, தஞ்சாவூர்: தமிழ்ப் பல்கலைக்கழகம்.
6. இராமசுப்பிரமணியம்.வ.த.(2004), பெரிய புராணம், சென்னை: திருமகள் நிலையம்.
7. மரிய அந்தோணி(1982), தேம்பாவணி, பாளையங்கோட்டை: வீரமாமுனிவர் ஆய்வுக்கழகம்
8. சிற்பி பாலசுப்பிரமணியம், கம்பலைமானுடம், சென்னை: வானதி பதிப்பகம

LANGUAGE THROUGH LITERATURE – I

SUBJECT CODE:

OBJECTIVE

- To promote competency in language skills.

UNIT I – PROSE

1. Bookshop Memories - George Orwell
2. On Marriage - Ernest Barker

UNIT II – POETRY

1. Let me Not To the Marriage of True Minds - William Shakespeare
2. Sonnet on His Blindness - John Milton

UNIT III – TALES

1. Taming of the Shrew
2. Julius Caesar

UNIT – IV – SPOKEN ENLGIHS

1. Greeting
2. Introducing
3. Making request
4. Seeking Permission
5. Expressing Gratitude
6. Complementing / Congratulating

UNIT - V

1. Letter Writing
   Application for Job
   Letters of Inquiry and Complaint
2. Situational Messages.

REFERENCES

1. Menon K.P.K, (2005). *Prose in practice*. Chennai: Macmillan India.
2. Natarajan. K, (2011). *The musical thought*. Chennai: New Century Book House.
3. Dodd. E.F, (2011). *Six tales from shakespeare*. Chennai: Macmillan India.
4. Radhakrishna Pillai.G & Rajeevan.K, (2014) *Spoken english for you.* New Delhi: Emerald Publishers.
5. Thangasamy, S. Kokila, (2011). *Polite eng*lish. Gandhigram (T.N): Anichum Blooms Publishers.

SEMESTER - III

MATHEMATICS

CORE PAPER - V
GROUPS AND RINGS
(120 Hours)

SUBJECT CODE:

UNIT-I

Group Theory: Introduction – Algebraic Structure –Groupoid-Semi-Group-Monoid-Group-More Examples for Group – Basic Properties of Groups – Equivalent Definitions of a Group – Order of an Element – Permutations – Cayley Tables for Finite Groups – Subgroups – Cyclic Groups.

UNIT-II

Subgroups Generated by a set S – Cosets – Normal Subgroups – Factor Group (Quotient Group) – Homomorphism – Isomorphism – Transference of Group Structure – Automorphism – Direct Products – Internal Direct Products.

UNIT-III

Ring Theory: Introduction – Elementary Properties of Rings – Subrings – Integral Domain - Ideals.

UNIT-IV

Factor Rings (Quotient Rings) – Maximal and Prime Ideals – Homomorphism of Rings – Isomorphism of Rings – Transference of Ring Structure – Field of Quotients of an Integral Domain.

UNIT-V

Special Class of Rings: Unique Factorization Domain – Euclidean Domain – Prinicipal Ideal Domain and Unique Factorization Domain – Notherian and Artinian Rings – Polynomial Rings.

REFERENCES

1. Murugan M., (2017).*A First course in Groups and Rings*, Muthali Publishing House, Chennai,
2. Arumugam S. and Thangapandi Isaac A., (1996).*Morden Algebra*, Scitech Publications, Chennai.

CORE PAPER - VI
REAL ANALYSIS I
(120 Hours)

SUBJECT CODE:

UNIT-I

Preliminaries - Sets and functions, Countable sets, Uncountable sets, Inequalities of Holder and Minkowski,. Metric Spaces - Definitions and examples, Bounded sets in a metric space, Open ball in a metric space, Open sets, Subspaces, Interior of a set, Closed sets, Closure, Limit point, Dense sets.

UNIT-II

Complete Metric Space - Completeness, Baire's Category theorem.

UNIT-III

Continuity - Continuity, Homeomorphism, Uniform continuity, Discontinuous functions on **R**.

UNIT-IV

Connectedness - Definition and examples, Connected subsets of **R**, Connectedness and continuity.

UNIT-V

Compactness - Compact space, Compact subsets of **R**, Equivalent characterisation for compactness, Compactness and continuity.

REFERENCES:

1. 1. Arumugam S. and Thangapandi Isaac A., (1996). *Modern Analysis*, New Gamma Publishing House.
2. Golberg R., (1985).*Methods of Real Analysis*, Oxford and IBH Publishing Co.

STATISTICS - I
(120 Hours)

SUBJECT CODE:

UNIT-I

Theory of Probability - Sample space - Probability function - Laws of Addition - Boole's inequality - law of multiplication - Problems - Baye's theorem - problems.

UNIT-II

Random Variables - Distribution function - Discrete and continuous random variables - Probability density function - various measures of central tendencies - Dispersion, Skewness at Kurtosis for continuous probability Distributions.

UNIT-III

Joint probability mass function - marginal and conditional probability functions - Independent random variables.

UNIT-IV

Mathematical Expectation - Moment generating function - Cumulants - Theoretical discrete distributions - Binomial - Poisson - Moments - Cumulants.

UNIT-V

Curve Fitting and Principle of Least Squares.

REFERENCES

1. Gupta S.C. and Kapoor V.K., (2001). *Elements of Mathematical statistics* third edition, Sultan Chand & Sons.
2. Gupta S.P., (2001).*Statistical Methods*, Sultan Chand and sons.

PHYSICS

CORE PAPER - III
ANALOG, DIGITAL ELECTRONICS AND MICROPROCESSOR
(120 Hours)

SUBJECT CODE:

OBJECTIVE: To enable the students to know about the basic knowledge of semiconductor, power supply and their applications in day-to-day life. To gain knowledge on OP-AMP,Digital fundamentals, Basics 8085 microprocessor and their importance in various applications.

ANALOG ELECTRONICS

UNIT – I(25hrs)

SEMI CONDUCTOR AND POWER SUPPLY

Band theory of solids – Types of semiconductor – Majority and minority carriers – Mobile charge carriers and immobile ions – Drift current in intrinsic semiconductor – PN junction – Depletion layer – Barrier voltage – Effect of temperature – Forward biased and reverse biased PN junction – Zener breakdown – Avalanche breakdown – h-parameters in CE and CB configuration.Rectifiers – Half wave - Full wave rectifiers – Voltage regulation using Zener diode and transistor.

UNIT-II: (25hrs)

AMPLIFIERS, OSCILLATORS AND OPERATIONAL AMPLIFIER

Single stage CE transistor amplifiers –RC and transformer coupled two stage amplifiers – Direct-coupled amplifier using complementary and symmetry of two transistors – Darlington pair-general theory of feedback- Properties of negative feedback-Criterion for oscillation - Comparison between an amplifier and an oscillator –Hartley and Colpitt's oscillator - Crystal controlled oscillator – Astable, Monostable and Bistable multivibrators.

Characteristics of ideal and practical operational amplifiers – Sign changer- Scale changer – AC inverting amplifier – Adder – Subtractor - Integrator – Phase shifter- Differentiator.

DIGITAL FUNDAMENTAL AND DEVICES

UNIT-III: (25hrs)

NUMBER SYSTEMS AND LOGIC GATES

Number System – Binary, octal and Hexa decimal number system – Boolean algebra – simplification of Boolean expressions- Karnugh Maps - Basic logic gates – Symbols and their truth tables-AND,OR,NOT,NAND , NOR ,XOR AND XNORgatesNAND and NOR as a universal gates - DeMorgan's theorem .

UNIT-IV: (25hrs)

COMBINATIONAL AND SEQUENTIAL DIGITAL SYSTEMS

Half adder – Full adder - Half subtractor – Full subtractor – 4 Bit binary adder – Flip-flops - RS flip flop – D-flip-flop- - JK flip flop and Masteer slave flip-flop - Digital to Analog converter (R-2R ladder D/A converter) – Analog to Digital converter (counter type A/D converter) – Counters –Controlled shift counters-Mod10 counter – Ring counters –shift registers.

MICROPROCESSOR(8085)

UNIT –V (25HRS)

8085 MICROPROCESSOR FUNDAMENTALS AND PROGRAMMING

Introduction to microprocessor – Basic components of a microcomputer – I/O devices – Memory – ROM – RAM – Architecture of 8085 – Address bus – Data bus – Control bus – Pin configuration – Registers

Arithmetic and logic unit – Flags – Instruction format – Types of instructions – Addressing modes –
Assembly language programming – Programmes for 1s and 2s complement,8 bit addition, 8 bit subtraction, biggest and smallest from thegiven list.

REFERENCES

1. Theraja B.L.,(2004). *Basic Electronics solid state*, New Delhi, S. Chand and company Ltd
2. Albert Paul Malvino Donald P. Leach, (1991). *Digital Electronics and Applications*, New Delhi, Tata McGraw- Hill
3. NagoorKani A, (1999). *Microprocessor and its applications*, RBA Publication, Chennai.
4. R.S. Sedha, (2010). *Applied Electronics*, S.Chand and company Ltd New Delhi,
5. A.P Mathur, (2001), *Introduction to Microprocessor*, New Delhi, Tata McGraw Hill
6. Ramesh Gaonkae . (1999). *Microprocessor and its Application* , Mumbai , Penram Publication.

CORE PAPER - IV
EXTENSIBLE LEARNING PHYSICS – III
(60 Hours)

SUBJECT CODE:

Objectives:

- To enable the students to enhance their capability of understanding about the basics of laws of motion, force , work ,energy and sources of energy .
- To improve their Scientific and technical skills through activities.
-

Unit –I (12 hrs)

Uniform Motion and Non Uniform Motion

Motion along straight line- Definition of Uniform motion an non uniform motion- Measuring rate of motion -Speed with direction-rate of Change of velocity-Graphical representation of motion-Distance-time graphs-Velocity-Time Graphs-Equation of Motion By graphical Methods-Equation for Velocity –Time Relation-Equation for position Time relation-Equation for position –Velocity Relation-Uniform Circular Motion.

Activities and demonstrations

Preparation of data regarding the motion of two different objects – Average distance covered by a moving car –Measurement of time while walking between two destinations- Preparing distance - time graph of uniform motion and non-uniform motion of a car from time verses velocity data – Describing circular motion through stone with thread.

Unit – II (12 hrs)

Laws of motion and momentum

Balanced and Unbalanced force -First law of Motion - Inertia and mass-Second law of motion-Mathematical formulation of Second law of motion-Third law of motion-Conservation of Momentum-Conservation laws.

Activities and demonstrations

Pushing a box on a rough floor –Inertial force while travelling in a motor car –rolling of a marble in an inclined plane –demonstratin of coin ,card, tumbler and horizontal flick – starting of a car with dead battery – catching a fast moving cricket ball – bullet and recoil of Gun – conservation of momentum : cork and test tube

Unit – III (12 hrs)

Work and energy

Work-Scientific Concept Of work-Work Done by a Constant Force-Energy-Forms Of energy-Kinetic Energy-Potential energy- Potential energy of an object at a height-Law Of conservation Of energy-Rate of doing work – kilo Watt hour.

Activities and demonstrations

Listing of activities which is normally considered to be work in day to-day life – lifting of an object –demonstration of positive and negative work-Different forms of Energy: group discussion –understanding of work and energy while moving a trolley on a stops placed table - energy associated with a spring , toy car with winding key and an arrow – observing , discussing the features of the house electric meter.

SEMESTER - III

Unit – IV (12 hrs)

Sound waves and Acoustics

Production of sound- Propagation of sound- longitudinal waves-Characteristic of a sound waves-Speed of sound in different media- Reflection of sound –Echo-Reverberation-Uses of Multiple reflection of sound-Range of hearing-Applications of Ultra sound -SONAR - Structure of Human ear.

Activities and demonstrations

Understanding of vibration of a tuning fork by keeping on water surface and hanging ball-preparing list of musical instruments –Understanding of sound waves in medium and Vaccum – longitudinal waves in a slinky – demonstration of reflection of sound waves : pipes using chart paper – demonstration of sound created by megaphone and horn. - Ultrasonic waves generated by a bat.

Unit – V (12 hrs)

Sources of Energy :Conventional energy

Good sources of energy –Fossil fuels - advantages and disadvantages of fosil fuels - basics of thermal power plant – Hydro power plant – schematic view of hydro power plant - Bio – mass – Bio – gas production plant – wind energy.

Activities and demonstrations

Model preparation to demonstrate thermoelectric power production (cooker , rotor- blade assembly, cycle dynamo, bulb) - Listing of different hydroelectric projects in India – Survey on wind velocity rich areas in India.

REFERENCES

1. CRC Handbook of Physics & Chemistry, (1999). New York,CRS Press,
2. D. Halliday, R.Resnick and J.Walker,(2001). *Fundamentals of Physics*, New York, Wiley
3. D.Halliday, R.Resnick and K.S.Krane, (1994). Physics Vols I, II & II Extended , New York, Wiley
4. NCERT (NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING) text books for standard IX,X,New Delhi.
5. R P. Feynman, R B Leighton and M Sands, (1998). The Feynman Lectures on Physics, VoIs. I, II, and III, New Delhi, Narosa.
6. Tamilnadu Text Books for CBSE IX,X.
7. Tamilnadu Text Books for standard IX,X.
8. www.ncert.nic.in
9. https//www.practicalphysics.org
10. https://www.education.com>activity >physics
11. https://www.iop.org>education>itp>resources
12. https://www.nsf.gov>news>physics

SEMESTER - III

CORE PRACTICAL - II

SUBJECT CODE:

(60 Hours)

CORE PRACTICAL – II (Any 12 Experiments)

1. Metre bridge – Resistance and specific resistance.
2. Determination of 'M'–Tan C position.
3. Carey Foster bridge –R and P
4. Potentiometer – low range voltmeter calibration.
5. Potentiometer - low range ammeter calibration.
6. Potentiometer –Temperature coefficient R.
7. Figure of Merit – Ballistic galvanometer.
8. Field along the axis of the coil – Determination of B_H.
9. Sonometer – A.C frequency.
10. Junction diode characteristics.
11. Zener diode characteristics.
12. Construction of Half wave rectifier.
13. 12 – 0 – (-12) Dual IC regulated power supply
14. Verification of truth tables of AND, OR ,NOT ,NAND, NOR and EX-OR gates.
15. NAND as universal gate.
16. Transistor characteristics – CE mode.
17. OP-AMP – Adder and Subtractor.
18. OP-AMP – Inverting and Non inverting
19. OP-AMP - Sign changer and Scale changer

REFERENCES

1. S. Srinivasan, (2005).A Text Book of Practical physics, New Delhi, S. Sultan Chand publications.

2. R. Sasikumar, (2011). Practical Physics, New Delhi, PHI Learning Pvt. Ltd.

3. https//www.practicalphysics.org.

ALLIED CHEMISTRY – I

SUBJECT CODE:

(80 Hours)

UNIT- I Chemical Calculations

Formula mass – Avogadro number – Mole concept – Stoichiometric equations – Methods of expressing the concentration of solutions. Calculations based on the principle of volumetric analysis. Preparation of standard solutions.

UNIT- II Environmental chemistry

Pollution – Definition – causes of pollution – types of pollution – Air pollution – control – acid rain – photochemical smog – ozone hole – greenhouse effect. Water pollution- Organic pollutants – inorganic pollutants – suspended solids and sediments – radioactive materials – thermal pollutants. Sewage – sewage treatment – determination of BOD and COD. Land pollution – control. Radioactive pollution – effects – protection and disposal. Noise pollution – measurement – source – effect – control.

UNIT- III Basic concepts in organic chemistry

Organic chemistry – catenation – classification – functional group – homologous series – isomerism – cleavage of bonds – Types of organic reactions – types of reagents – polar and non-polar molecules – polar effects (inductive, mesomeric and electromeric)

UNIT- IV Electrochemistry

Electrochemistry – Electrode potential – single electrode potential – calomel electrode – standard hydrogen electrode – measurement of single electrode potential – electrochemical series – applications. Types of electrodes. Electrochemical cells – reversible and irreversible cells – standard cell – measurement of EMF – batteries – lead storage – nickel cadmium cells.

UNIT- V Fuels

Fuels – Characteristics of a good fuel – advantages and disadvantages of solid, liquid and gaseous fuels – calorific value of a fuel – theoretical calculation of calorific value. Coal – classification – analysis – difference between coal, coke and charcoal. Liquid fuels – origin – refining – cracking. Gaseous fuels – Natural gas – Liquefied petroleum gas – water gas – biogas.

REFERENCES

1. 1 Bahl, B.S. and Arun Bahl, (2010), Advanced Organic Chemistry, New Delhi, S. Chand & Company Private Limited.
2. Puri, B.R. and Sharma, L.R, (2011), Principles of Physical Chemistry, Jalandhar, Vishal publishing company.
3. Ravikrishnan, A., (2007), Applied chemistry, Chennai, Sri Krishna Publication.
4. Krishnamurthy, N., Vallinayagam, P., Jeyasubramanian, K., (2001) Applied Chemistry, Delhi, Tata McGraw-Hill publishing company limited.
5. https://www.khanacademy.org/science/chemistry/chemical-reactions-stoichiome
6. https://www.wyzant.com/resources/lessons/science/chemistry/introduction_to_organic_chemistry
7. https://fenix.tecnico.ulisboa.pt/downloadFile/3779579580823/Chap-7_Fuels.pdf

SEMESTER - III

ALLIED CHEMISTRY PRACTICALS

SUBJECT CODE:

(40 Hours)

Quantitative analysis:

1. Estimation of hydrochloric acid using sodium carbonate
2. Estimation of hydrochloric acid using link sodium hydroxide and standard oxalic acid
3. Estimation of Ferrous iron using link potassium permanganate and standard oxalic acid.
4. Estimation of oxalic acid using link potassium permanganate and standard ferrous ammonium sulphate.
5. Estimation of ferric iron using standard potassium dichromate and external indicator Potassiumferrocyanide.

Qualitative analysis:

Qualitative analysis of simple organic compounds containing any one functional group Acids, aldehydes, ketones, diamide, amines, simple phenols and carbohydrates.

REFERENCES

1. Venkateswaran, V., Veeraswamy, R. and Kulandaivelu, A.R, (2006), Basic Principles of Practical Chemistry, New Delhi, Sultan Chand & Sons Private Limited.
2. https://en.wikipedia.org/wiki/Qualitative_inorganic_analysis
3. https://archive.org/stream/manuchemianalqual00newtrich#page/n19/mode/2up
4. https://www.britannica.com/science/qualitative-chemical-analysis.

CHEMISTRY

CORE PAPER- III
INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY - III

SUBJECT CODE:

(120 Hours)

UNIT-I

Classification of oxides based on their chemical behaviour-acidic, basic, amphoteric and neutral oxides. Classification based on oxygen content-normal oxides, peroxides, super oxides, dioxides and mixed oxides. Hydrogen peroxide-preparation, properties structure and uses. Preparation, properties, structure and uses of oxy acids of sulphur-H_2SO_3, H_2SO_5, H_2SO_4, $H_2S_2O_7$ and $H_2S_2O_8$.

UNIT-II

Metallurgy-concentration of ores-gravity separation, froth flotation, magnetic separation, chemical separation. Extraction – roasting – calcinations-smelting, purification of metals-electrolysis, zone-refining, vapour phase refining- van-Arkel method.

Position of alkali metals in periodic table. Anomalous behavior of lithium. Diagonal relationship between Li and Mg. Occurrence, extraction, properties and uses of Li and Na.

UNIT-III

Transition elements-general characteristics-position in the periodic table, trends in physical and chemical properties. Occurrence, extraction, properties and uses of titanium, vanadium, molybdenum and tungsten. Chemistry of titanium dioxide, titanium tetrachloride, vanadium pentoxide, ammonium metavanadate and ammonium molybdate.

UNIT-IV

Definition of terms-system, surrounding and boundary, types of systems, state of a system, properties of a system, extensive and intensive properties, thermodynamic processes, thermodynamic equilibrium, nature of work and heat. First law of thermodynamics-statement and significance, internal energy and enthalpy, reversible and irreversible processes. Heat capacity-correlation between Cp and Cv. Thermochemistry-Hess's law and its applications, relation between heat and energy, determination of heat of a reaction and bond energy, temperature dependence of heat of a reaction-Kirchoff's equation.

UNIT-V

Preparation of formaldehyde, acetaldehyde, benzaldehyde, cinnamaldehyde, acetone, acetophenone and benzophenone, addition reactions with Grignard reagent, HCN, $NaHSO_3$ and NH_3.Reduction reactions with $LiAlH_4$, Wolf-Kishner and Clemmenson reductions, mechanisms of aldol, Cannizaro, Perkin, Knoevenagel, Claisen and Haloform reactions. Tests for aldehydes and ketones, differences between aldehydes and ketones.

REFERENCES

1. Bahl, B.S. and Arun Bahl, (2010), Advanced Organic Chemistry, New Delhi, S. Chand & Company Private Limited.
2. Madan, R.D., (2008), Modern Inorganic chemistry New Delhi, S. Chand & Company Private Limited.
3. Puri, B.R. and. Sharma, L.R, (2011), Principles of Inorganic Chemistry, Delhi, Milestone publishers & distributors.

4. Puri, B.R. and Sharma, L.R, (2011), Principles of Physical Chemistry, Jalandhar, Vishal publishing company.
5. https://www.wyzant.com/resources/lessons/science/chemistry/introduction_to_organic_chemistry
6. http://www.askiitians.com/revision-notes/chemistry/
7. http://www.askiitians.com/revision-notes/chemistry/aldehydeketone-and-carboxylic-acid/

CHEMISTRY FOR SCHOOL EDUCATION - PAPER – III

SUBJECT CODE:

(60 Hours)

UNIT- I Matter

Matter – Classification – activity based learning about physical nature of matter. Characteristics of particles of matter – activity based learning. States of matter - change of states of matter – activity based learning. Mixtures – types – activity based learning. Definition and properties of solution and suspension.

UNIT- II Matter

Separation of components of a mixture – activity based learning. Demonstration experiments showing distillation and fractional distillation. Air – separation of components of air – chart preparation. Crystallisation – activity based learning. Water purification – chart preparation. Substances - types. Difference between Mixtures and Compounds – chart preparation. Demonstration experiments showing the variation in solubility with temperature.

UNIT -III Atoms and molecules

Laws of chemical combination – activity based learning. Atom, atomic mass, molecule, molecular mass, molecules of elements, molecules of compounds, definition of ions. Writing chemical formula of compounds – chart preparation. Molecular mass – mole concept. Preparation of electronic chart display matching mass number and chemical formula.

UNIT – IV Structure of the atom

Charged particles in matter. Comparison of the properties of electrons, neutrons and protons – chart preparation. Thomson model of atom. Rutherford's model of atom – drawbacks. Bohr's model of atom. Distribution of electrons in different orbits for first eighteen elements. Electronic model showing the schematic atomic structure of these elements. Chart preparation for the electronic distribution of first eighteen elements.

UNIT – V Natural resources

Resources on earth – air, role of atmosphere in climate control, movement of air - activity based learning. Rain – rain fall patterns in India – activity based learning, Water pollution. Soil-soil erosion – activity based learning. Chart preparation about water cycle, nitrogen cycle, carbon cycle and oxygen cycle. Greenhouse effect. Ozone layer – importance, factor influencing ozone layer. Micro and macro nutrients for plant growth. Definitions of manure, fertiliser, herbicide and pesticide.

REFERENCES

1. 10^{th} Standard science books, New Delhi, NCERT (National Council of Educational Research and Training).
2. http://ncert.nic.in/textbook/textbook.htm?iesc1=0-15
3. http://chemistrynoteslecture.com/Units%201-12%20High%20School%20Chemistry.html
4. https://byjus.com/ncert-solutions-class-9-science/

SEMESTER - III

CORE PRACTICAL – II

SUBJECT CODE:

(60 Hours)

A. VOLUMETRIC ANALYSIS

Acidimetry and Alkalimetry

1. Estimation of sodium carbonate using link hydrochloric acid and standard sodium carbonate.
2. Estimation of hydrochloric acid using link sodium hydroxide and standard oxalic acid.
3. Estimation of carbonate and bicarbonate in a mixture by Warder's method.

Permanganometry

4. Estimation of ferrous iron using link potassium permanganate and standard oxalic acid.
5. Estimation of oxalic acid using link potassium permanganate and standard ferrous ammonium sulphate.
6. Estimation of calcium using link potassium permanganate and standard oxalic acid.

Dichrometry

7. Estimation of ferric iron using standard potassium dichromate and external indicator potassium ferricyanide.
8. Estimation of ferric iron using standard potassium dichromate and internal indicator diphenylamine.
9. Estimation of potassium dichromate using link sodium thiosulphate and standard potassium dichromate.

Iodometry and iodimetry

10. Estimation of copper using link sodium thiosulphate and standard potassium dichromate.

Argentometry(demonstration)

12. Estimation of chloride using link silver nitrate and standard sodium chloride.

EDTA Titration

13. Estimation of hardness of water by EDTA method.

B. ORGANIC CHEMISTRY PRACTICALS

Qualitative analysis of monofunctional groups

Organic compounds containing any one of the following functional groups/compounds may be given for analysis:

Acids, esters, aldehydes, ketones, nitrocompounds, anilides, amines, carbohydrates, amides, phenols, naphthols, dihydric phenols, aromatic nuclear halogen compounds and aromatic side chain halogen compounds, urea and thiourea.

Organic Preparations

Preparation of acetanilide from aniline, benzanilide from aniline, benzoic acid from ethylbenzoate, parabromoacetanilide from acetanilide, aspirin, nitrobenzene, glucosazone and salicylic acid from methyl salicylate.

REFERENCES

1. Venkateswaran, V., Veeraswamy, R. and Kulandaivelu, A.R, (2006), Basic Principles of Practical Chemistry, New Delhi, Sultan Chand & Sons Private Limited.
2. Thomas, A., (1981), Practical Chemistry, Cannanore, Scientific Book Centre.
3. http://wwwchem.uwimona.edu.jm/lab_manuals/c10expt25.html

SEMESTER - III

4. https://in.okfn.org/files/2013/07/An-Introductory-Course-of-Quantitative-Chemical-Analysis.pdf
5. https://www.thinkiit.in/iit-qrp/english/theory/chemistry/organic/practical-organic-chemistry/
6. https://www.bookrix.com/book.html?bookID=deepakpant1_1276415412.1891009808#0,558,23526

ALLIED PHYSICS – I

SUBJECT CODE:

(80 Hours)

UNIT - I (16 Hrs)

Elasticity

Hooke's law-Different moduli of elasticity- Relation between elastic moduli- Poisson's Ratio-Poisson's Ratio in terms of Elastic constants- Bending of moment –Determination of young's modulus by non uniform bending-Torsional oscillation – Determination of Rigidity modulus by static torsion-Torsion Pendulum-Determination of Rigidity modulus and moment of inertia.

Mechanics

Centre of Gravity – Centre of Gravity of a solid hemisphere – hemisphere and Solid Cone.Stability of Floating bodies : Metacentre – Determination of a Metacentric height of a Ship

UNIT - II (16 Hrs)

Sound

Transverse vibration of stretched strings- velocity of transverse waves-Simple Harmonic Motion Melde's string experiment –Intensity of sound –Doppler effect- Microphone and loud speaker.

Acoustics of buildings Reverberation - Reverberation time – Sabine's formula conditions for good acoustics. Decibel – Phone – Intensity measurement by hotwire microphone method

UNIT - III (16 Hrs)

Relativity

Postulates of special theory of relativity –Lorentz transformation – time dilation and length contraction –

Addition of velocities – Mass energy relation

UNIT - IV (16 Hrs)

Thermal Physics

Newton's law of cooling – Verification – Specific Heat Capacity of liquid by Cooling - Bomb Calorimeter.

Conduction : Coefficient of thermal conductivity – Good and bad Conductor - Lee's disc experiment Stefan's law of radiation – Solar Constant – Angstrom's Pyroheliometer – Temperature of the Sun.

UNIT - V (16 Hrs)

Optics

Wave optics – Interference- Michelson interferro meter – Velocity of light and splitting of spectral lines – diffraction – Newton's ring – plane diffraction grating –determination of wavelength .Polarisation – production and analysis of circularly and elliptically polarized light

Fiber Optic communication : Introduction – Optic Fiber – Numerical Aperature – Fiber optic communication System and its advantage.

REFERENCES

1. Properties of matter and sound – R.Murugesan , S.Chand & Co. Delhi.
2. Sound – Saigal – S.Chand & Co. Delhi.
3. Heat and Thermodynamics – Brijlal and Subramaniam , S.Chand & Co. Delhi.
4. Optics – Brijlal and Subramaniam, S.Chand & Co. Delhi.
5. Magnetism and Electricity – Khare and Srivastava – Atma Ram and Sons – New Delhi.
6. Modern Physics – Murughesan – S.Chand and Co.
7. Hand Book of Electronics – Gupta and Kumar – Pragati Prakasan. Meerut.

SEMESTER - III

ALLIED PHYSICS PRACTICAL

SUBJECT CODE:

(40 Hours)

1. Measurements of length (or diameter) using Vernier calipers, Screw gauge and Travelling microscope
2. Young's Modulus - Non uniform bending – Pin and Microscope Method
3. Young's Modulus - uniform bending
4. Compound pendulum
5. Rigidity modulus – Torsional pendulum
6. Coefficient of Viscosity of Liquid using graduated burette.
7. Specific heat capacity of liquid by Cooling Method.
8. Lee's Disc – Thermal Conductivity of Bad Conductor.
9. Spectrometer – Grating – Normal incidence method.
10. Spectrometer – Refractive index of Solid Prism (A,D and μ)
11. Newton's Rings – Radius of curvature of a convex lens
12. Sonometer – Verification of Three laws.
13. Meter Bridge – Verification of Resistance in Series and Parallel.
14. Moment of a magnet – Tan 'C' position
15. Characteristics of a junction diode
16. Construction of a full wave rectifier.
17. AND, OR and NOT logic gates – verification of truth table using Discrete components.
18. Potentiometer – Calibration of low range ammeter
19. Potentiometer – Calibration of voltmeter
20. NAND as Universal gate.

REFERENCES

1. A textbook of practical Physics – M.N. Srinivasan and others – Sultan Chand & Sons, New Delhi.
1. Practical Physics – A. Dhana Lakshmi and K.R. Paramasivam – Apsara.

BOTANY

CORE PAPER - III
PLANT ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS

SUBJECT CODE:

(120 Hours)

UNIT I

Structure and function of simple & complex tissues. Meristematic tissues: definition,structure, function& classification. apical organization and theories:apical cell theory, Histogen theory & Tunica – Corpus theory. Root apex: Histogen theory &Korper-Kappe theory. Secretary tissues:external glands &nectarines and internal lacticifers.

UNIT II

Tissue systems: structure and function in root, stem & leaves. Epidermal tissue system: epidermis, cuticle, trichome, stomata, bulliform cells, cork and silica cells. Ground tissue systems:cortex, endodermis, pericycle, pith & pith rays.Vascular tissue systems: different types of vascular bundles and their arrangement in root and stem. Nodal anatomy: leaf trace, leaf gap, branch trace and branch gap.

UNIT III

Stem thickening in monocots and dicots, Dicot root thickening. Anomalous secondary growth of Stem- Bougainvillea, Bignonia, Nyctanthes and Dracaena. Periderm structure and development: Phellem, Phellogen, Phelloderm, Rytidome and lenticels.

UNIT IV

Structure and development of anther-microsporogenesis, development of male gametophyte, dehiscence of anther, structure of pollen and its germination, and viability.

UNIT V

Structure and development of ovule –megasporogenesis, development of an embryosac – monosporic (Polygonum type), bisporic (Allium type) and tetrasporic (Peperomia type). Structure of mature embryo sac, double fertilization, apomixes. Development of an endosperm and embryo in dicots and monocots, polyembryony, structure of fruit and seed.

REFERENCES

1. Tayal, M.S., Plant Anatomy, 3rd edition, (2012), Rastogi Publications, Meerut.
2. Pandey, B.P., 1978, Plant Anatomy, S.Chand& Co., New Delhi,
3. Vasishta, P.C., A Text Book of Plant Anatomy, Pradeep Publications, Jullunder.
4. Bhojwani, S.S. and Bhatnagar, S.P., 1978, The embryology of Angiosperms, publishing House, N.Delhi.
5. Dwinedi, J.N., 1988, Embryology of Angiosperms, Rastogi and Co., Meerut.

6. Singh,V.,Pande,P.C.,Jain,D.K.,Embryology of Angiosperms,2010-11,Rastogi Publications, Meerut.

7. Esau, K., 1975, Plant Anatomy, Wiley Eastern Private Ltd., New Delhi.
8. Fahn, A., 1974, Plant Anatomy, Pergoman Press, Oxford.
9. Maheswari, P., 1971, An introduction to Embryology of Angiosperms, Tata McGraw Hill Publishing Co.Ltd, New Delhi. 1

1. Swamy,B.G.L. and Krishnamurthy,k.V., From Flower to Fruit, Tata McGraw Hill Publishing Company Ltd.,New Delhi.
2.

BIO BASICS III – BOTANY

SUBJECT CODE:

(60 Hours)

UNIT – I

Pollination and fertilization: – definition, Types of pollinators biotic, abiotic.

UNIT – II

Types of pollination 1. Self-pollination- Autogamy, Geitonogamy, advantages and disadvantages of self-pollination.

UNIT – III

Cross pollination. Agents of pollination- characteristic features of the following Hydrophily, Anemophily, Zoophily- Entomophily, Ornithophily.

UNIT – IV

Contrivances for ensuring cross pollination. Coevolution of flowering plants and their pollinator. Advantage of cross pollination.

UNIT – V

Outline of fertilization. Fruits: definition, types: simple, aggregate, multiple. Dry dehiscent, dry indehiscent, and fleshy fruits

REFERENCES

1. R.V. NarayanaSwamy, K. N. Rao, 2009. Outlines of Botany. V.Subramanian Pvt. Limited, Chennai.
2. B.P. Pandey, 2011. Botany for Degree students, S.Chand&Co.Ltd., New Delhi .
3. B.P Pandey, 2010. Modern Practical Botany vol I, vol II, vol III, S.Chand& Company

CORE PRACTICAL – II

SUBJECT CODE

(60 Hours)

PLANT ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS

1. Cell types and tissues
2. Non-living inclusions : starch grains, cystoliths, raphides and aleurone grains
3. Primary structure of stem, root and leaf-dicot and monocot
4. Stomatal types-anomocytic, anisocytic, paracytic, diacytic and grass type
5. Secondary structure of dicot stem and root
6. Anomalous secondary structure- Bougainvillea, Bignonia, Nyctanthesand Dracaena
7. Identification of wood based on either RLS or TLS
8. Identification of C.S. of anther, embryosac, monocot and dicot embryo
9. Identification of placentation types
10. Identification of various stages of dicot embryo

TAXONOMY OF ANGIOSPERSMS AND ECONOMIC BOTANY

1. Morphological identification of Plant Parts and their modifications.
2. Dissection of floral parts of plants belonging to the families.
3. Identify and comment on use of plants.
4. Field trips (Minimum 5 Days) to places within or outside the state under the guidance of teachers to study plants in their natural habitats.
5. Preparation and submission of 10 Herbarium sheets.

REFERENCES

1. Tayal, M.S., Plant Anatomy, 3rd edition, (2012), Rastogi Publications, Meerut.
2. Pandey, B.P., 1978, Plant Anatomy, S.Chand& Co., New Delhi,
3. Vasishta, P.C., A Text Book of Plant Anatomy, Pradeep Publications, Jullunder.
4. Bhojwani, S.S. and Bhatnagar, S.P., 1978, The embryology of Angiosperms, publishing House, N.Delhi.
5. Dwinedi, J.N., 1988, Embryology of Angiosperms, Rastogi and Co., Meerut.
6. Singh,V.,Pande,P.C.,Jain,D.K.,Embryology of Angiosperms,2010-11,Rastogi Publications, Meerut.
7. Esau, K., 1975, Plant Anatomy, Wiley Eastern Private Ltd., New Delhi.
8. Fahn, A., 1974, Plant Anatomy, Pergoman Press, Oxford.
9. Maheswari, P., 1971, An introduction to Embryology of Angiosperms, Tata McGraw Hill Publishing Co.Ltd, New Delhi. 1
10. Swamy,B.G.L. and Krishnamurthy,k.V., From Flower to Fruit, Tata McGraw Hill Publishing Company Ltd.,New Delhi.
11. Naik, V.K., Principles of Plant Taxonomy, IBH Oxford.
12. Vasishta, P.C., 1994, Taxonomy of Angiosperms R.S. Chand & Company
13. Verma, B.K., Introduction to Taxonomy of Angiosperms (2011) PHI Learning Pvt.Ltd. N.Delhi.
14. Sharma, O.P., 1993, Plant Taxonomy, Tata McGraw Hill.

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15. Chopra, G.L., 2004, Angiosperms, Pradeep Publications, Jalandar.
16. Pandey, B.P., Economic Botany, S.Chand& Company, New Delhi.
17. Sambamurthy, A text Book of Economic Botany, Wiley Eastern Pvt.Ltd. 8. Saxena, N.B., and Sabena's., 7th Edition (2010), PragatiPrakashan, Meerut.
18. Lawrence, G. H.M., 1969, Taxonomy of vascular Plants Oxford & IBH Publishing Co.N.Delhi.
19. Rendle, R.B., The Classification of flowering plants, Vol. I, II &III, Oxford-Clarendon.
20. Gamble, J.S., Flora of Presidency of Madras, Vols. I, II & III (1986) Bishen Singh Mahendra Pal Singh, Dehra Dun.
21. Albert F.Hill, Economic Botany, Tata McGraw Hill Publishing Company.

ALLIED CHEMISTRY – I

SUBJECT CODE:

(80 Hours)

UNIT- I Chemical Calculations

Formula mass – Avogadro number – Mole concept – Stoichiometric equations – Methods of expressing the concentration of solutions. Calculations based on the principle of volumetric analysis. Preparation of standard solutions.

UNIT- II Environmental chemistry

Pollution – Definition – causes of pollution – types of pollution – Air pollution – control – acid rain – photochemical smog – ozone hole – greenhouse effect. Water pollution- Organic pollutants – inorganic pollutants – suspended solids and sediments – radioactive materials – thermal pollutants. Sewage – sewage treatment – determination of BOD and COD. Land pollution – control. Radioactive pollution – effects – protection and disposal. Noise pollution – measurement – source – effect – control.

UNIT- III Basic concepts in organic chemistry

Organic chemistry – catenation – classification – functional group – homologous series – isomerism – cleavage of bonds – Types of organic reactions – types of reagents – polar and non-polar molecules – polar effects (inductive, mesomeric and electromeric)

UNIT- IV Electrochemistry

Electrochemistry – Electrode potential – single electrode potential – calomel electrode – standard hydrogen electrode – measurement of single electrode potential – electrochemical series – applications. Types of electrodes. Electrochemical cells – reversible and irreversible cells – standard cell – measurement of EMF – batteries – lead storage – nickel cadmium cells.

UNIT- V Fuels

Fuels – Characteristics of a good fuel – advantages and disadvantages of solid, liquid and gaseous fuels – calorific value of a fuel – theoretical calculation of calorific value. Coal – classification – analysis – difference between coal, coke and charcoal. Liquid fuels – origin – refining – cracking. Gaseous fuels – Natural gas – Liquefied petroleum gas – water gas – biogas.

REFERENCES

1. B. S. Bahl and ArunBahl, Advanced Organic Chemistry,S.Chand&Company, Edn. (2010).
2. B. R.Puri and L. R. Sharma, Principles of Physical Chemistry, Vishal Publication, Edn. 44 (2011).
3. Ravikrishnan, Applied chemistry, Sri Krishna Publication, Edn (2007).
4. N. Krishnamurthy, P. Vallinayagam, K. Jeyasubramanian, Applied Chemistry, Tata McGraw-Hill publishing company limited, Second edition (2001).

ALLIED CHEMISTRY PRACTICALS

SUBJECT CODE:

(40 Hours)

Quantitative analysis:

1. Estimation of hydrochloric acid using sodium carbonate
2. Estimation of hydrochloric acid using link sodium hydroxide and standard oxalic acid
3. Estimation of Ferrous iron using link potassium permanganate and standard oxalic acid.
4. Estimation of oxalic acid using link potassium permanganate and standard ferrous ammonium sulphate.
5. Estimation of ferric iron using standard potassium dichromate and external indicator Potassiumferrocyanide.

Qualitative analysis:

Qualitative analysis of simple organic compounds containing any one functional group Acids, aldehydes, ketones, diamide, amines, simple phenols and carbohydrates.

REFERENCES

1. V. Venkateswaran, R. Veeraswamy and A. R. Kulandaivelu, Basic Principles of Practical Chemistry, Sultan Chand & sons (2006).

ZOOLOGY

CORE PAPER - III
CELL BIOLOGY

SUBJECT CODE:

(120 Hours)

UNIT-I

History and scope of Cell Biology – Microscopy – Types – Light, Phase contrast, SEM, TEM. Cell theory. Viruses – Types, cell size and shape – Bacteria – Types, cell size and shape. Phages, Viroids

UNIT-II

Ultra structure of Animal cell. Cytoplasm – Structure, Composition & Function. Plasma Membrane – Ultra structure - Theories and models. Functions – Transport of small molecules, Endocytosis.

UNIT-III

Ultrastructure and function of Endoplasmic reticulum, Ribosomes, Golgi complex, Lysosomes, Centrioles and basal bodies.

UNIT-IV

Ultrastructure and function of Mitochondria. Nucleus – Nuclear membrane – Nucleoplasm – Chromosomes – Heterochromatin and Euchromatin – Nucleolus. Giant chromosomes: Polytene chromosomes: occurrence and structure. Lamp brush chromosomes: occurrence and structure.

UNIT-V

Cell division – Cell cycle. Amitosis. Mitosis and Meiosis: all stages, nature of chromosomes during different stages and significance.

REFERENCES

1. DeRobertis, E.D.P. and E.M.F. DeRobertis, 1988. Cell and Molecular Biology, 8th edition, HonKong, New Age International Ltd
2. Giese, A.C., 1979. Cell Physiology, Philadelphia, London ,Saunders Co.
3. Powar, C.B., 1989. Essential of Cytology, Bombay , Himalaya Publishing House
4. Veerbala Rastogi 1969 Introductory cytology. Meerut. Kedar Nath Ram Nath
5. Verma, P.S. and V.K. Agarwal, 1995. Cell and Molecular Biology, 8th edition, New Delhi , S.Chand & Co.,
6. https://archive.org/details/cytology00wils
7. https://www.amazon.in/Text-Book-Cytology-P-S-Verma-ebook/dp/B00QUYL0F4
8. http://www.freebookcentre.net/biology-books-download/An-introduction-to-cytology.html

SEMESTER - III

BASICS IN ZOOLOGY - III

SUBJECT CODE:

(60 Hours)

UNIT-I Our environment -Physical resources:

Air, Water, Soil. Air for respiration, for combustion, for moderating temperatures; movements of air and its role in bringing rains across India.

Air, water and soil pollution (brief introduction). Holes in ozone layer and the probable damages; waste production and their solutions ; solid waste management; radioactive waste management; greenhouse effect and climate change; deforestation ; Biodegradable and non-biodegradable substances.

Bio-geo chemical cycles in nature: Water, oxygen, carbon and nitrogen.

UNIT-II Natural Resources :

Sources of energy: Different forms of energy, conventional and non-conventional sources of energy: fossil fuels, solar energy; biogas; wind, water and tidal energy; nuclear energy. Renewable versus non-renewable sources.

Management of natural resources: Conservation and judicious use of natural resources. Forest and wild life; Coal and Petroleum conservation. Examples of people's participation for conservation of natural resources. Big dams: advantages and limitations; alternatives, if any. Water harvesting. Sustainability of natural resources.

UNIT-III Biodiversity and its Conservation

Concept of biodiversity; patterns of biodiversity; importance of biodiversity; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, national parks, sanctuaries.

UNIT-IV

Biomolecules

Chemical constituents of living cells: biomolecules, structure and function of proteins, carbodydrates, lipids, nucleic acids, enzymes, types, properties, enzyme action

Cell Cycle and Cell Division

Cell cycle, mitosis, meiosis and their significance.

UNIT-V Heredity and evolution: Heredity; Mendel's contribution- Laws for inheritance of traits: Sex determination: brief introduction; Basic concepts of evolution.

REFERENCES

1. NCERT , CBSE & TN TEXT BOOKS OF CLASS 9, 10, 11, 12
2. Verma, P.S. 2004 Cell biology , Genetics , molecular biology , Evolution and Ecology, New Delhi , S.Chand & Co.
3. V.K. Agarwal, 1995. Cell and Molecular Biology, 8th edition, New Delhi , S.Chand & Co
4. NCERT , CBSE , TN TEXT BOOKS OF CLASS 9, 10, 11, 12
5. John Hall 2015, Guyton & Hall Text book of Medical Physiology , USA, Saunders
6. R.C.Dubey 1993 Text book of Biotechnology , New Delhi , S.Chand publishing Co.

SEMESTER - III

7. R.C.Dubey & D.K.Maheswari 2013, Text book of Microbiology , New Delhi , S.Chand publishing Co.
8. https://medicforyou.in/satyanarayana-ebook-download-free-pdf
9. http://www.textbooksonline.tn.nic.in/books/12/std12-biochem-em.pdf
10. https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf.
11. http://www.freebookcentre.net/medical_books_download/Human-Physiology-Lecture-Notes.html
12. https://moorthibio.weebly.com/uploads/4/7/5/6/4756207/ebooksclub.org__biotechnology.pdf
13. https://archive.org/details/ost-biology-microbiology

CORE PRACTICAL - II
CELL BIOLOGY, GENETICS

SUBJECT CODE:

(60 Hours)

CELL BIOLOGY

1. Micrometry – Use of Microscopes, Camera Lucida, Stage and Ocular Micrometer.
2. Blood smear preparation – Differential Count of WBC.
3. Counting of RBC and WBC using Haemocytometer
4. Mounting of Buccal epithelium and observing living cells using vital staining.
5. Mitosis in Onion root tip squash
6. Study of prepared slides of histology
   a. Columnar epithelium b. Ciliated epithelium c. Areolar Connective tissue
   d. Cartilage T.S. e. Bone T.S. f. Cardiac tissue g. Striated muscle h. Non striated muscle i. Nervous tissue
   j. Ovary T.S. k. Testis T.S.

GENETICS

7. Mendelian crosses – Examples for Incomplete dominance and co-dominance, lethal genes, supplementary genes, complementary genes, epistasis, polygenic (quantitative) inheritance, skin colour in man.
8. Study of the biology of Drosophila.
9. Observation of Common mutants of Drosophila
10. Human blood grouping.
11. Normal karyotype in human beings,
12. Chromosomal anomalies and disorders: Down's, Turner's and Klinefelter's syndromes
13. Gene mutations: autosomal mutations like albinism, PKU, alkaptonuria, sickle cell anaemia, thalassemia, sex chromosomal mutations: haemophilia, Polygenic traits: cleft palate / lip

REFERENCES

1. Verma, P.S. and V.K. Agarwal, 1995. Genetics, 8th edition, New Delhi ,S. Chand & Co
2. Goodenough, V., 1978. Genetics, 2nd ed., New York Holt, Rinchart and Winston
3. Watson, J.D. and W.A. Benjamin, 1976. Molecular Biology of the Gene, New York, Benjamin Co. Inc.,
4. Winchester, 1967. Genetics, New Delhi, Oxford IBH Publications
5. P.S. Verma & V.K. Agarwal , 1999 . Concept of Genetics, Human genetics & Eugenics — New Delhi , S. Chand & Company
6. http://web.iitd.ac.in/~amittal/SBL101_Essentials_of_Genetics.pdf
7. http://gsi.semmelweis.hu/files/ebook/Genetics%20genomics_en.pdf
8. http://www.agrimoon.com/wp-content/uploads/Principle-of-Genetics.pdf

SEMESTER - III

ALLIED CHEMISTRY – I

SUBJECT CODE:

(80 Hours)

UNIT- I Chemical Calculations

Formula mass – Avogadro number – Mole concept – Stoichiometric equations – Methods of expressing the concentration of solutions. Calculations based on the principle of volumetric analysis. Preparation of standard solutions.

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Pollution – Definition – causes of pollution – types of pollution – Air pollution – control – acid rain – photochemical smog – ozone hole – greenhouse effect. Water pollution- Organic pollutants – inorganic pollutants – suspended solids and sediments – radioactive materials – thermal pollutants. Sewage – sewage treatment – determination of BOD and COD. Land pollution – control. Radioactive pollution – effects – protection and disposal. Noise pollution – measurement – source – effect – control.

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UNIT- V Fuels

Fuels – Characteristics of a good fuel – advantages and disadvantages of solid, liquid and gaseous fuels – calorific value of a fuel – theoretical calculation of calorific value. Coal – classification – analysis – difference between coal, coke and charcoal. Liquid fuels – origin – refining – cracking. Gaseous fuels – Natural gas – Liquefied petroleum gas – water gas – biogas.

REFERENCES

1. 1. . S. Bahl and ArunBahl, Advanced Organic Chemistry,S.Chand&Company, Edn. (2010).
2. B. R.Puri and L. R. Sharma, Principles of Physical Chemistry, Vishal Publication, Edn. 44 (2011).
3. Ravikrishnan, Applied chemistry, Sri Krishna Publication, Edn (2007).
4. N. Krishnamurthy, P. Vallinayagam, K. Jeyasubramanian, Applied Chemistry, Tata McGraw-Hill publishing company limited, Second edition (2001).

ALLIED CHEMISTRY PRACTICALS

SUBJECT CODE:

(40 Hours)

Quantitative analysis:

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2. Estimation of hydrochloric acid using link sodium hydroxide and standard oxalic acid
3. Estimation of Ferrous iron using link potassium permanganate and standard oxalic acid.
4. Estimation of oxalic acid using link potassium permanganate and standard ferrous ammonium sulphate.
5. Estimation of ferric iron using standard potassium dichromate and external indicator Potassiumferrocyanide.

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REFERENCES

1. V. Venkateswaran, R. Veeraswamy and A. R. Kulandaivelu, Basic Principles of Practical Chemistry, Sultan Chand & sons (2006).

EDUCATION

CONTEMPORARY INDIA AND EDUCATION - PART I

SUBJECT CODE:

(60 Hours)

OBJECTIVES

At the end of the course, the student-teachers will be able to:

1. develop an understanding of the nature of social diversity and the educational demands of the diverse communities
2. explain the salient features of Indian constitutional values on education
3. analyse the causes for inequality, discrimination and marginalisation in education
4. develop an understanding of the educational policies and programmes during the pre-independent and post-independent periods
5. examine the issues of language policy in education
6. develop an understanding on the emerging trends in education.

Unit - I Understanding the social diversity

Social diversity: Meaning and definition - Levels of social diversity: Individual, regional, linguistic, religious, castes and tribes - Education for understanding the social diversity in India.

***Suggested instructional approaches/methods*:**

i. Invited talk on the social diversity of Indian society.
ii. Report presentation based on the group discussion on the role of education to understand the social diversity in India.

Unit - II Educational demands of individuals and diverse communities

Universalisation of primary education - Programmes to achieve universalisation of education: SSA, RMSA, RUSA, integrated education and inclusive education - Challenges in achieving universalisation of education - Education for collective living and peaceful living: Four pillars of education as viewed by Delor's Commission Report.

***Suggested instructional approaches/methods*:**

i. Report presentation based on the group discussion/student seminar on the efforts taken by the Government of India and Tamil Nadu to achieve universalisation of education.
ii. Report presentation based on the group discussion/student seminar suggesting the curriculum for collective and peaceful living of people

Unit - III Indian Constitutional values on education

Preamble of the constitution - Fundamental rights and duties of citizens - Directive principles of State policy and education - Challenges to fulfill the constitutional obligations: freedom, justice, equality, fraternity and education - Right to Education Act.

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***Suggested instructional approaches/methods*:**

i. Invited talk/teacher talk on the constitutional provisions to enjoy freedom, justice, equality in education.
ii. Invited talk /legal expert(s) talk on the salient features of Right to Education Act.

Unit - IV Inequality, discrimination and marginalisation in education

Social inequity in society - Causes for inequality, discrimination and marginalization in education - Types of inequity: caste, class, gender, regions - Elimination of social inequities through education - Education for marginalized groups: Dalits, tribals, and women.

***Suggested instructional approaches/methods*:**

i. Report presentation based on the field study /observation about the difficulties of tribals and dalits in accessing education.
ii. Report presentation based on the brainstorming session on the effective use of education for elimination of social inequities

Unit - V Policy frameworks on education: Pre-independent India

Salient features of Vedic, Buddhist and Jain system of education – Development of education during the pre-independent period – Characteristics of Basic education and its relevance to the present day context.

***Suggested instructional approaches/methods*:**

i. Report presentation based on the group discussion/student seminar about the relevance of basic education to the present day context.
ii. Report presentation based on the group discussion/student seminar on the impact of pre-independent period education on Indian society.

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SEMESTER - III

GENDER, SCHOOL AND SOCIETY

SUBJECT CODE:

(60 Hours)

OBJECTIVES

At the end of the course, the student-teachers will be able to:

1. understand the concept of gender roles in society
2. explain the gender identity and socialization process
3. identify gender roles in textbooks and curriculum
4. discuss safety of girls and women at school, home and workplace
5. understand the representation of gender in various mass media.

UNIT - I GENDER ROLES IN SOCIETY

Gender: Meaning and definition - Difference between gender and sex - Gender roles in society: family, caste, class, religion, culture, the media and popular culture, law and the state (film, advertisements, songs, etc) - Reasons for gender inequalities - Gender-just education outside school settings.

Suggested instructional approaches/ methods:

i) Seminar on reasons for gender inequalities.

ii) Discussion the roles of men and women family, caste, class, religion, culture, the media and popular culture, law and the state.

UNIT - II GENDER IDENTITY AND SOCIALIZATION PROCESS

Gender identity and socialization practices in family, school and organization - Role of school, peers, teachers, curriculum and textbooks in challenging gender inequalities or reinforcing gender parity - Actual gender roles and responsibilities assigned in schools and classrooms – Measurement of gender identity - discrimination of gender in classroom interactions, rituals and school/ routines - Processes of disciplining techniques for boys and girls - Analysis of sex-roles stereotype.

Suggested instructional approaches/ methods:

i) Presentation of a paper on gender roles based on the visit of students in a school.

ii) Seminar on the processes of disciplining techniques for boys and girls after visiting schools/ home.

UNIT - III GENDER AND SCHOOL CURRICULUM

Representation of gender roles in school textbooks and curricula - Role of schools in nurturing or challenging young people as masculine and feminine selves - Integration of gender roles in school and curriculum - Gender issues in diverse cultural constraints: Teacher's role - Developing positive attitude towards opposite genders in schools - gender bias in education - Transgender: providing opportunities for education, employment and life skills - Developing school curriculum for gender equality.

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Suggested instructional approaches/ methods:

i. Student seminar on representation of gender roles in textbooks and curriculum.

ii. Workshop on developing school curriculum for equality and gender- just society.

UNIT - IV VIOLENCE ON SAFETY OF GIRLS AND WOMEN

Safety of girls and women at school, home and workplace - Sexual abuse and violence: Role of education in preventing them - Meaning and concept of body objectification - Combating female body objectification: Role of teachers and parents.

Suggested instructional approaches/ methods:

i) Brainstorming session on safety of girls at school, home and workplace.

i) Teacher talk on role of teachers and parents in combating female body objectification.

UNIT - V MASS MEDIA AND GENDER

Gender roles in mass media – Gender stereotypes in mass media - gender identity roles - Positive notions of body and self - Gender in media: magazines, TV shows, cartoons, movies and advertisements - Gender equality and language use.

Suggested instructional approaches/ methods:

ii) Student seminar on gender stereotypes in mass media.

iii) Poster show presentation on gender in media.

TASKS AND ASSIGNMENTS

1. Prepare a report on different roles of adolescents (boys and girls) in the context of emerging society.
2. Prepare a report on child abuse/violation of girl's rights by collecting data from various media resources.

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