SYLLABUS IN CHEMISTRY

- **Gaseous States:** Deviation from ideal behavior, Vander waals equation of state critical phenomena: PV isotherms of real gases, continuity of states, the isotherms of Vander waals equation.
- **Atomic Structure:** Idea of de Broglie matter waves, Heinserberg uncertainty principle, Black-body radiation, Compton effect, photoelectric effect, concept of quantization. Quantum numbers, radial and angular, Autbau and Pauli exclusion principles, Hund's multiplicity rule, effective nuclear change.
- **Periodic Properties:** Atomic and ironic radial, ionization energy, electron affinity and electro negativity definition.
- **Chemical Bonding:**
  A. Covalent Bond - Various types of hybridization and shape of simple inorganic molecules and ions, application to NH 3.
  B. Ionic Solids: Born Haber cycle, Solvation energy and Solubility of ionic Solids, polarization and polarisability, Fajan's rule.
  C. Weak Interactions: Hydrogen bonding
- **Nuclear Chemistry:** Artificial radioactivity, fission and fusion reactions, and Radio Carbon dating.
- **Chemical Kinetic & Catalysis:** Chemical Kinetics and its scope. Concentrating dependence of rates, mathematical characteristics of simple chemical reactions- Zero order, first order, second order, pseudo order, help life and mean life.
- **Nomenclature of Organic Compounds:** Nomo & poly functional groups. IUPAC recommendation for naming organic compounds, bridge head compounds.
- **Mechanism in organic reaction:** Resonance Hyper conjugation, elimination, substitution, free radical mechanism.
- **Inorganic Qualitative Analysis:** Identification of the basic and the acid radicals of a mixture of Inorganic consisting of not more than six radicals .
- **Nomenclature in complex inorganic compound:** Werner's Theory of coordination compound, optical isomerism and geometrical isomerism.
- **Chemistry of elements:** Characteristics properties of d-block elements, properties of the elements of the first transition series, lanthanide and actinide.
- **Dilute Solution & Colligative Properties:** Colligative properties , Raoult's law relative lowering of vapour pressure, osmotic , of osmotic pressure and its measurement , Determination of molecular weight from osmotic pressure, elevation of boiling point and depression of freezing point, strength of the solution.
- **Arenes and Aromaticity:** Nomenclature of bernseal derivatives. The aryle group. Aromative nucleus and side chain. Structure of benzene molecular formula and kekule structure, Aromaticity- the Huckel, the aromatic ions.
- **Volumetric Analysis:**
  1. Estimation of Ferrous and Ferric by dichromate method.
  2. Estimation of calcium content in chalk as calcium oxalate by permangenometry.
- **Chemical Equilibrium:** Equilibrium constant and free energy. Le-Chatelier's principle.
- **Electromagnetic spectrum:**

  Ultraviolent Spectrometry

  Basic principles

- **Infra-Spectrornetry:**

  Introduction, basic principles of I.R. spectrum

- **Nuclear Magnetic Resonance Spectgrometry:**

  Introduction , basic principles of NMR.

- **Mass Spectrometry:**

  Basic principle

- **Chromatography:** Basic idea on principles of chromatography, paper chromatography, column chromatography, Gas-liquid chromatography, TLC.
- **Organic Qualitative Analysis:** Detection of elements (Nitrogen, Sulphur and halogens). Tests of functional groups-phenolic, carboxyl is, carbonyI, esters, Carbohydrates, amides, nitro anilide, Identification of an organic compound through functional group analysis.

  Determinations of melting point/boiling point of organic compound. Preparation of derivative and it's melting point determination.

- **Estimation of Phenol and aniline:** Preparation of Picric acid, ethylbenzoate, idoforrn from ethanol and acetone.
- **Partition in Co-efficient:**
  Room temperature.
  Pseudo forst order hydrolysis rate.
- **Analytic Experiments:**
  1. Determination of sapoification value of exter
  2. Estimation magnesium and calcium in a mixture by EDAT titration.

SYLLABUS IN BOTANY

- **Algae:** General Characters, classification and economic importance, Volvox, Oadogonium, Vauvheria, Ectocarpus, Polysiphonia.
- **Fungi:** Saprologina, Mucor, Puccinia, Agricus, Economic importance reproduction is Lichens.
- **Bryophytes:** Classification and comparative study of morphology, Anatomy reproduction broad interrelationship, Ricia, Anthoceros, Funnia. A general account evolutionary significance of Psilopsida, Rhnia, Lycopodium, Selaginatia, Marsilea, Heterosory and seed habits.
- **Organisation of the higher plant body:** Meristems and development, Vascular cambrium, Secondary phloem and peridium, Comparative account of prodaryotic and eukaryotic characteristics,
- **Cell division and its regulation:** Mitosis and meiosis, various stages of cell division progression; cytokinesis; models of cell membrance or organization,
- **Nucleic Acids:** DNA structure, A, B, and Z forms of DNA, Chromatin, DNA-depedant RNA synthesis (Transcription), genetic code and protein synthesis (translation).
- **Gene Structure, Expression and regulation:** operon concept, gene regulation in prodaryotes, inducible, repressible, Positive and negative gene regulation,
- **Recombinant DNA Technology:** Restriction endonucleases, prokaryotic and eukareotic cloning vectors.
- **Plant Biotechnology:** Cellular differentiation and totipotency.
- **Plant-water relation:** Water transport processes, diffusion and osmosis, water potential, absorption of water, water transport through tracheids, mechanism of stomatal movement, photosynthesis
- **Nitrogen Metabolism:** Biological nitrogen fixation, reduction of N_2 into ammonia
- **Growth and Development:** Physiology of seed dormancy and seed germination, concept of photoperiodism, auxins, cytokinins, gibberllins abscisis acid and ethylene, biological. Transport of Organic Substances.
- **Plant Breeding:** Different types of Selection of self pollinated and cross pollinated Plants.
- **Organismal Ecology/ Biotic Components:** Hydrologic Gaseous,
  Diversity of Ecosystem: Aquatic (Fresh Water), terrestrial (forest/grassland), Man-made ecosystems.
- **Human Ecology and Ecological Management:** Renewable and non-renewable natural resources and their management, conservation.
- **Impact of Human Activities**: Pollution of air, water and soil, Global warming, general account of morphology, Cycas, Pinus, Gnetum, bentham and Hookner's system, Engler and Prantl's system and Takhatjan's system, Herbarium specimen and their preparation.
- **Phylogeny of Angiosperms:** Range of flora structures and diversity of orders of Dicotyledons (Rnanales), Rosales, Asterales and Genetianales and Euphorbiales and Monocotyledons (Liliales, Poales and Orchidales).

SYLLABUS IN HOME SCIENCE

- **Cell:** It's structure and functions. Cell division. Blood- Plasma, its composition function, Erythrocytes. Its structure and functions disintegration and blue pigments. Hemoglobin and its functions. Blood platelets-structures and functions, Cardiac cycle, Structure of arteries, veins and capillaries. Systematic circulation, pulmonary circulation and portal circulation.
- **Kidney:** Microscope structures, formation of urine, the digestive glands their location and secretion in the body, their action of different types of foods.
- Textile: Classification of textile fibers-Natural and man-made Cotton, silk and wool- their sources, structure, physical and chemical properties.
- **Dry Cleaning and Dyeing:** Methods of Dry Cleaning, chemical used for the same advantages and disadvantages, classification, Methods of washing and finishing of cotton, silk and woolen fabrics, Stain removal, classification, general principles of stain removal and methods, Identification of Cotton, Silk and Wool by Visual, Washing and finishing of cotton, silk and woolen garments, Stain removal, and blue ink, tea, coffee, blood, curry, nail polish and paint stains.
- **Study of Foods:** Cereals, pulses, vegetables and fruits, their composition, nutritive value and effect of cooking on nutritive value, Importance and nutritive value of commonly used milk and different milk products.
- **Food Preservation:** Definition, importance, principles of food preservation-both.
- **Menu Planning:** Planning of meals for the family of different income levels.
- **Balanced Diet:** Planning balanced diet for men and women doing sedentary, moderate and heavy work.
- **Carbohydrates:** Composition, functions sources requirements, effects of deficiency.
- **Proteins:** Composition, Classification, function, sources, requirements and effects of deficiency.
- **Vitamins:** Fat-soluble and water soluble, Composition, functions, Thiamine, Niacin, Folic Acid, Ascorbic Acid.
- **Minerals:** Calcium, iron, iodine, fluorine, Importance of water and roughage, Home Management-Process.

- **Resources:** Definition, Classification, Types, characteristics, Principles applicable to Time and Energy.
- **Interior Decoration:** Elements of design, Principles of design (Harmony).
- **Colour:** Colour-Hue, value, intensity, Colour harmony-related use of colour in house decoration, Preparation of balanced diet for adult men and women.
- **Family Finance:** Cause of different in wages.
- **Family Expenditure:** Types of budget, items, Financial records of the household their nature and examples of account keeping.
- **Saving:** Purpose of savings, kinds of savings.
- Methods of data collection- Interview. Questionnaire, Experimental, case study, Mean median and mode.
- **From Birth to 5 Years:** Physical development, speech development, social development, Values, types, characteristics.
- **Perceptual Process:** Perception, illusion and hallucination, remembering and forgetting, recalling.
- **Types of Marriage:** Arranged and free choice, their advantages and disadvantages, Role of women in the family and society.
- **Problems of Indian Women:** Cause and types of problems in the family work place and other places.
- **Dowry System:** Its advantages and disadvantages and its ill effects in our society.
- **Family:** Definition of family, types of family, changing family pattern in India, beginning family, Expanding and contracting family.

Gravitational field and potential due to solid sphere and spherical shell, compound pendulum, Kater's pendulum, central force motion reduction of two body central force motion into equivalent one body motion, general features of central force motion, differential equation of orbit, Kepler's laws of planetary motion, Virial thereon.

Elastic constants for homogeneous isotopic solid their inter relation, torsion of a cylinder, bending of beams cantilever, beam supported at both ends and loaded at the middle. Kinematics of moving ideal fluid, equation of continuity, Euler's equation for ideal fluid, Bernoulli' theorem, Vikscous fluids, Laminar flow through narrow tube, Poiseulle's formula, Scale's viscometer , surface tension and surface energy, pressure difference across a curves liquid surface, gravity waves and ripples.

- **Thermal and Statistical Physics:**

Thermodynamic system, thermodynamic equilibrium, Zeroth law of thermodynamics, thermodynamic process, work done in isothermal and isobaric process, internal energy, firsts law of thermodynamics, application to various processes, Cp-Cv, equation of state for adiabatic process, work done in adiabatic process, polytropic process, heat engine, Carnot cycle, Carnot engine, Carnot theorem, second law at thermodynarnics, entropy as a thermodynamics variables, entropy, Helmholtz free energy and Gibbs function, Maxwell's Thermodynamic equation, Joule-thomson effect, first order phase transition Clausious-Clapeyron equation.

- **PRACTICAL:**

1. Acceleration due to gravity by bar pendulum and study of the effect of amplitude on time period.
2. Young's modulus of a wire by Searlis method.
3. Viscocity of water using capillary tube flow method.
4. Specific heat of liquid by method of cooling.
5. Wave length of unknown light by drawing calibration curve of prism spectrometer.

Simple harmonic motion, damped harmonic motion, power loss, Q-factor, under damped, over damped and critically damped motion, forced vibration resonance, sharpness of resonance, Composition of SHM, Lissajous figure for superposition of two orthogonal simple harmonic vibrations (a) with same frequency and (b) frequency in the ratio 2:1. Theory of plucked, struck and bowed strings, Production and properties ultrasonic waves.

- **Electricity, magnetism and electromagnetic theory:** Coulomb's law, electric field, field at point due to (a) electric dipole, (b) Discrete distribution of charge and (c) continuous distribution of charge, Fludx of electric field , Gauss law of electrostatics, filed due to linear, spherical and plane charge distribution, curl of electrostatic field.

Electrostatic potentials, relation between field an potentials, potential due to localized charge distribution, electrostatic boundary conditions, work done in moving a charge, energy of (a) discrete and (b) continuous charge distribution , basic properties of conductors, surface charge on a conductor, differentials form of Gaus law, Laplace's equation, Poisson's equation, solution of laplaces equation in spherical polar coordinates, conducting sphere in a uniform electric field, dielectric polarization, field inside a dielectric, Gauss law in a dialectic medium, linear dielectrics, Susceptibility, permittivity, dielectric constant, boundary conditions on the displacement vector D, dielectric sphere in an external uniform electric field, force on a point charge enbedoed in a dielectric, molecular field in dielectric, Clausin's Mossotti relation, energy in a dielectric medium, Electric current, current denisity, equation of continuity. Ohm's law, electromotive' force, steady current in media without sources of e.m.f.

Magnetic induction, B. Lorentz force law, force on a straight current carrying conductor in a uniform magnetic field, torque on a current loop. The law of Biot and Savart, magnetic induction due to straight , circular and solenoidal currents, Ampere's circular law, its differential form, magnetic victor potential, magnetic field due to a distant circuit, magnetic scalar potential , torque on a current loop placed in external uniform magnetic field, moving coil and balastic galvanometer , Magnetic properties of matter, magnetization, field of magnetises object, Ampere's law in magnetized medium, magnetic intensity, magnetic susceptibility and permeability, hysteresis, boundary condition on H and D, Langevin theory, diamagnetism and paramagnetism, Weiss theory of Ferromagnetism.

Motional e.rn.f and flux rule, Faraday's law of electromagnetic induction in differential and integral form, induced electric field due to an infinite long wire carrying a slowly varying current, self inductance, mutual inductance, self inductance of a solenoid and of a straight conductor, energy stored in an inductor in an electromagnetic field, Transient currents-growth and decay of current in series RC, LC and LCR circuits, alternating currents-sinusoidal voltage applied to series RC, LR, LC and LCR circuits, power in AC, series and parallel resonant circuits, sharpness of resonance, Q-factor, displacement current and its physical significance, Maxwell's

electromagnetic equations in free space and in medium, boundary conditions, solar potential and vector potential, Gauge transformation, Coulomb gauge and Lorentz gauge, Electromagnetic waves, Pointing theorem, energy and momentum of electromagnetic wave, electromagnetic waves in non conducting media, propagation of Waves in vacuum and in linear media , Reflection and transmission at a conducting surface(Normal incidence)

- **PRACTICAL-B**

1. Rigidity modulus of a wire by static method.
2. Rigidity modulus of a wire by dynamic method.
3. Surface ension of soap solution.
4. Coefficient of viscosity by Stoke's method.
5. Wave length of light by Newton's rings.
6. Comparision two nearly equal resistances by Carey-Foster (pointer galvanometer)
7. Comparision of e.m.f. using starched wire potentiometer (pointer galvanorneter)

- **Geometric Optics, Physical Optics, Laser:** Ferrnat's principle, reflection and retraction at plane interface, Matrix formulation of geometrical optics; cardinal points of coaxial system, cardinal points of combination of two thin lenses and a thick lens. Monochromatic aberration – spenerical aberration and its minimisation, elementary ideas about coma, astigmatism, curvature, distortion and their remedies, chromatic aberration, achromatic combination , removal of chromatic aberration in a separated double Ramsden's and Huygen's eye-piece, dispersion, theory of formation of primary and secondary rainbow.

Wave theory of light, Huygen's principle, reflection and refraction at place faces. Condition of interface, coherent sources, division of wave front , biprism, interference by p-lace parallel thin film illuminated by a point source, interference by wedge shaped thin film, colour of thin films, Newton's rings. Michelson's interferometer, determination of wavelength of monochromatic light and wavelength difference by it, Fabry-Perot interferometer, its resolving power, determination of wavelength by it.

Diffraction of light, Fresnel and Fraunhoffer diffraction , Fresnel's half period zones plate, its analogy with converging lens, diffraction at straight edge, Fraunhoffer diffraction by a single slit, double slit, place transmission grating, Rayleigh scattering , Raman effect.

Electromagnetic nature of light, polarized and unpolarised light, plane polarized, circularly polarized and elliptically polarized light, polarization by relflection , refraction and scattering, Brewster's law; Malus law, double refraction, ordinary and extra-ordinary rays. Nicol prism-construction and working, its uses as polarizer and analyzer, Babinet compensator, halfwaves plate and quarter wave plate, Laurent polarimeter.

- **Solid State Physics, Electronics:**Extrinsic and intrinsic semiconductors, p-type semiconductors. Pn-junction as rectifier. Half waave and full wave rectifier (centra type and bridges type), efficiency , ripple factor, use of RC, L and n filters, Zener diode as voltage regulator, working of pnp arid npn transistors, Static characteristics or transistors in CE and CB configurations ,relation between a and p, load line, operating point, transistor as a four part device , independence parameter , admittance parameter any hybrid(h) parameter, equivalent circuit for transistor.

Classification of amplifier, CE, CB, CC configuration, amplifier performance input, output resistance current voltage and power gain, RC coupled amplifier , gain frequency response, band width class A and class B push pull amplifier, distoration in amplifiers, field effect transistor, JEET-its operation and volt-ampere curve.

Positive and negative feedback, criterion for sustained oscillation, Heartly and colpit oscillator, phase shift oscillator, (principle, circuit operation, theory and use), Modulation and demodulation AM and FM modulation index and its significance, Principles of demodulation-linear diode dector, Integrated circuits-disadvantages, fabrication of monolithic ics, Digital electronics, binary and decimal number systems, logic gates AND, OR, NOT, NAND,NOR gates, truth table, DTL and TTL circuits for gates.

- **PRACTICAL –D**

1. Resolving power of prism spectroscope
2. Verification of Brewster's law.
3. Study of charging and discharging of capacitor through a resistor.
4. Determination of ballistic constant
5. Study of frequency response of LCR circuit.
6. Study of ripple factor and efficiency of rectifier(half wave and full wave)
7. Static characteristics of diode valve pn-junction.
8. Static characteristics of triode valve/transistor.

SYLLABUS IN EDUCATION

- **PHILOSOPHICAL AND SOCIOLOGICAL FOUNDATIONS OF EDUCATION:**
  a) **Concept and Scope of Education:** Education as a science, social process and human resource development.
  b) Aims of Education:
  Individual and social aims of education: Aims and objectives of education at different levels starting from primary to higher education.
- **Schools of Philosophy:** Idealism, Naturalism, Pragmatism, existenlism, their contribution to present day education.

Thoughts of great educators like; Rousseau, Dewey, Tagore, Gandhi, Sri Aurobindo.

- **EDUCATIONAL PSYCHOLOGY AND PEDAGOGY**

Educational Psychology: Its meaning, nature and scope.

Methods of Educational Psychology: Applications of Educational Psychology in Teaching, learning and in understanding individual's behavior.

a) **Adolescence :** Psychological characteristics and problems of adolescence, Role of education in solving their problems.
b) **Personality:** Definition, meaning and nature , development of personality , type and trait theories of personality.

Its meaning and nature, factors affecting learning, learning and maturati learning and motivation. Theories and Learning –Trial and error, conditioning , theory of learning , Transfer of learning.

Individual Differences-Its meaning, causes and its classroom implications.

Intelligence- Its definitions and nature of Intelligence, Determinants of intelligence, Measurement of intelligence.

Creativity-Its meaning and nature

- **DEVELOPMENT OF EDUCATION IN INDIA**

Education in Ancient and Medieval India:- Education in Ancient India:- Vedic and Brahmanic Period

(a) Vedic education- Aims of education, Process of education, curriculum and organization.

(b) Buddhist education- Aims of education, curriculum, Relevance of concepts like Madhyama, Pratipada, Pratitya assumpted four eternal truths, Macaulay's , Minutes Wood's , Education Despatch , Report of Hunter Commission, Movement for compulsory education, Gokhele's Bill, University Education Commission 1902, kothari Commission Report-19964-66,National Policy on education 1986 and its revised formulations of 1992- Comparative study with education during ancient period.

- **ISSUES AND TRENDS IN CONTEMPORARY INDIAN EDUCATION**

Role of NCERT, SCERT, NIEPA, CBSE, Role of UGC, AIU,AICTE, ICSSR,CSIR, ICA, types of universities and equivalent

a) Mission (NLM), TLC, PLC, JSN, Sarva Shikshya Abhiyan.

Population education, Family life and sex education, value oriented education, work-experience and SUPW, environmental education, education of women, education of women, education of minority community with reference to their aims and objectives, methods and problems.

Concept of continuous and comprehensive evaluation, evaluation of cognitive e and non-cognitive learning outcomes.

- **EDUCATIONAL EVALUATION**

Nature of educational measurement, Measurement and evaluation in education, Relationship between measurement and evaluation, Functions of measurement and evaluation in education, types of evaluation procedure-placement, formative , diagnostic and summative, Norm-reference, criterion-reference test.

a) Objectives: Taxonomy of educational objectives, Methods of stating instructional objectives with reference to cognitive domains.
b) Construction of objective based and objective-types of test items-Essay type, short answer type and objective types of test.

Validity, Reliability and objectivity.

- **EDUCATIONAL TECHNOLOGY**

Software and Hardware.

Programmed learning, Micro-teaching and Team teaching, Computer-Assisted Instruction, simulated teaching and Distance Teaching.

- **FUNDAMENTALS OF EDUCATIONAL RESEARCH AND STATISTICS**

Meaning, Nature and Scope of Fundamental Research, Need and Purpose of Educational Research.

- **PEDAGOGICAL SKILL TESTING**

Preparation of check-lists for identifying and indicating the degree.

Preparation of rating scales for classroom evaluation of learners in respect of certain qualities, Construction of Achievement Test on knowledge, Comprehension, Application objectives of cognitive Domain, Identification of major ideas, Minor ideas in different teaching units and also identification of different instructional objectives reflecting .

SYLLABUS FOR ANTHROPOLOGY

- **Prehistoric Archaeology-:** Definition, scope and Methods of Study of Prehistoric Archaeology, Relation of Prehistoric Archaeology with other branches of Anthropology.
- **Palaeoanthropology-:** Definition, Aims, Scope, Problems and Prospects of Palaeoanthropological Research with special reference to India.
- **Basic Concepts-:** Tools Type Tool, Artifact, Industry, Assemblage, Culture, Tradition, Period, Site, Core, Flake, Blade, Chips, Striking Platform and Bulb of Percussion.
- Characteristics of Indian Society, Unity in Diversity, Village Communities and Urban Communities, Backward Classes, Weaker Societies, Ethnic Minorities, Religious, Minorities.
- **Indian Social System and Culture-:** Varna order and Caste System, Folk Peasant Urban Continum, Rank and Status, Local Culture, Religional Cultures and National Culture, Ethno-Cultural Movements, Caste and Caste in Indian Politics.
- Sanskritisation, Westernisation, Modernisation, Urbanisation and Industriallsation anda process of Social Change.
- **Organic Evolution-:** Meaning and Theories, Lamarckism, Darwinism, Darwinism, Synthetic Theory of evolution, Mutation, Selection, Genetic Drift and gene flow and isolation, Major evidences between biological and cultural evolution in Man.
- Man's place in primate order, Comparative account of morphology, Anatomy and genetics of Man and Apes, Anatomical modification in Man due to the assumption of erect bipedal gait.
- Australopithecine, homohabilis, homoheidelbergensis, Homo-erectus and Phylogenic position, Multiregionalism.
- **Human Variation-:** Concept and definition and Non-metric, Broad outlines.
- Development of Human Genetics, Different branches of human Genetics, Population Genetics, Formal Genetics, Medical Genetics, Serogenetics, Molecular Genetics, Human Cytonetics, Pharmaco-genetics.
- Cell division, Mitosis and Meiosis, Human Chromosomes, Structure and function of DNA and RNA, Mendel's Law and its application to human populations.
- **Multiple Atteles-:** ABO, Rh, MN Blood group, Polygenic inheritance-Skin Colour, Human Genetics-Prenatal diagnosis and genetic counseling, legal applications of human genetics, Genetheraphy DNA Finger Printing.
- **Samatometry-:** Stature, Sitting, Height, Height acromion, Height Dactylion, Maximum Head Length, Maximum Head Breadth, Nasal Length, Nasal Breadth, Minimum Frontal Breadth, Bizygometic Breadth, Bigonial Breadth, Upper Facial Height.

- **Somatoscopy-:** Skin Colour, Eye Colour, Eye Fold, Face Form, Chin, Thickness of leaps, Nasal Septum, Nasal Root, Nasal Bridge, Nasal Tip, Ear Lob, Ear Size.
- **Craniometry and Mandibulometry-:** The candidates are required to take the following measurements on 10 craniums, Skull Maximum, Cranial length, Maximum Cranial Breadth, Bizygometic Breadth, Bigonial Length of Mandible, Breadth, Breadth of the Ramus.
- **Marriage and Family-:** Definition and Characteristics of Marriage, Marriage rules, Marriage payments, Types and patterns of residence after marriage. Family and household, Universality of family, Features, Types and function of family, Transformations in family.
- **Religion-:** Definition
- **Culture-:** Uniqueness of culture, Culture as an integral whole, Complex, Culture area, Culture Center.
- **Culture Process-:** Enculturation and Socialization.
- **Poverty and Development-:** General poverty in India, Deprivation and indigenous resources for sustainable development.
- **Tribal and Rural Development-:** Definition of Scheduled Tribe, Their types, Distribution and linguistic classification, Constitutional Safeguards for scheduled Tribes and Scheduled Castes, Role of Anthropology in development during Pre and Post-independence period, Tribal and rural development programme in Successive plan periods.
- The Marks shall be distributed as:-
    1. Forensic Application
    2. Dermatoglyphics
- **Secology and Genetic Traits-:** Test the blood group (ABO and Rh System) and ascertain PTC test.
- 1. Determination and sex of the skull
    2. Determination of Age of the skull.
- i. Main Line for Male
    ii. Main Line for Index
    iii. Palmar paterns

SYLLABUS IN GEOGRAPHY

- **GEOMORPHOLOGY:-**

Wegener's Continental Drift Theory.

Concept of Isostasy of Airy and Pratt.

a) Mass-wasting, Weathering, Erosion
b) Soil forming processes
i) Running water, ii) Underground water, iii) Glacier, iv) Wind, v) Sea-wave

- **CLIMATOLOGY AND OCEANOGRAPHY:-**

A. **Climatology:-**

Weather and climate; elements and factors of weather and climate, their composition and structure and the atmosphere, atmospheric pressure and winds; Vertical and horizontal distribution of pressure, planetary, periodic and local winds.

B. **Oceanography:**

Surface configuration of the ocean 'floor, continental shelf, continental slope, abyssal plain, mid-oceanic ridges and oceanic trenches, Relief of Atlantic , Pacific and Indian Oceans floor, waves, tides and currents

- **PRACTICAL:-**

Latitudes and longitude:-

Histogram, Frequency Polygon and Frequency Curve.
a) (Grouped and Ungrouped) Mean, Median, Mode:
b) Mean Deviation and Standard Deviation
c) Correlation : Product Moment Correlation and Spearman's Rank Correlation

- **ENVIRONMENT AND ECOSYSTEM**

Concept of Environment:-

Types of Environment – Physical and Cultural, Biuotic and Abiotic
a) Environmental hazards
Contempt of Ecosystem
a)Natural Cycle
b) Gaseous Cycle-Nitrogen Cycle, Carbon Cycle
a) Types of wastes and pollutants.

- **ECONOMIC AND SOCIAL GEOGRAPHY:-**

a) Resources- Concepts, Types, Distribution and Global Problems.
b) Agriculture-Types and problems of Agriculture, Von Thunen's theory of Agriculture location.
a) Industrial Location Theory of Weber

- **CARTOGRAMS:-**

Climograph, Hythergraph, Ergograph Isopleth, Choropleth

- **POLITICAL , POPULATION AND SETTLEMENT GEOGRAPHY:-**

a) Structure of Population-Age, Sex, Literacy, Occupational Structure, Rural Urban Composition.
b) Components of Population change-Fertility, Mortality , Migration, Growth of population

SYLLABUS IN STATISTICS

- **Algebra:** Determinants, evaluation and elementary properties, Matrices, types of matrics singular and non-singular matrics, operations, transpose, inverse and ranked matrix, Solution of linear equations, homogeneous and non-homogeneous characteristic equation and latent roots, quadratic forms, positive definite forms and canonical forms.
- **Calculus and Differential Equations:** Limit, continuity, differentiation, (Excluding inverse circular function) successive differentiations, partial differentiations, maxima and minima of function of one and two variables, Integration of simple algebraic, trigonometric and exponential functions, integration by substitution parts, Evaluation of definite integrals, Differential Equations- Definition, equations of first order an first degree.
- **Probability and Statistical Methods:** Idea about types of data collection, scrutinity and presentation of data, Analysis of quantitative data, univariable data, concepts and measures of central tendency, dispression and relative dispression, Skewness and Kurtosis and their measures including those based on quartiles and moments for grouped data (without derivation).
- **PRACTICAL:**
  - i) Different measures of central tendency and dispersion, their computation and interpretation.
  - ii) First four moments from ungrouped and grouped data, their computation and interpretation.
  - iii) Measures of Skewness and Kurtosis.
  - iv) Fitting of first, second and third degree polynominal and exponential curves.
  - v) Computation of linear correlation for ungrouped data, bivariate frequency table regression line, Rank correlation (with and without ties).

Concepts of population, Sample, Parameter, Statistics, Sampling distribution of statistics, Standard error of sample moments. Sampling distribution of sample mean and variance from normal distribution large sample theory and tests.

Problems of estimation, Estimator and its properties, Unbiasedness, Consistency, Efficiency and sufficiency, Methods of estimation-Maximum likelihood method and moment method. Rao-Cramer inequality and its applications.

Meaning and concept of tests of hypothesis a simple and composite hypothesis, Type-1 and Type-II errors, Size and power of the tests Test of simple hypothesis, Most powerful tests, Neyman-Pearson Lemma and its applications, Uniformity most powerful test, Unbiased tests (Type A and Type B).

- **Sampling Techniques:** Population and sample, sample versus complete enumeration, steps involved in sample surveys, Principles of Sample Survey, Random sampling versus non-random sampling , sampling and non sampling errors, simple random sampling with and without replacement, Methods of drawing simple random sample,

stratified random sampling. Allocation problems, Estimation of population mean, total with standard errors for the above sampling design, linear models, A theorem of importance in Model-I analysis, test of general linear Hypothesis analysis of variance of one-way model and two-way model, Principles of experimental design randomization, replication and local control, description and analysis of completely randomized design, ramdomised black design, Latin square design, Comparison of efficiencies, Missing plot analysis in RBD and LSD.

- **Time Series:** Components of time series, Methods of measurements of trend. Graphic method, Semi average method , Least square method and moving average method. Spencer's 15-point and 21-point formula simple and weighted measurement of seasonal fluctuation.
- **Index Number:** Definition, construction of index numbers (price and quality) criteria of a good index number classification of index number, cost of living index number : Construction and uses. Base shifting , splicing and drafting of index number.
- **Computer and Basic Programming:** Understanding the computer, Problem solving, Flow charts, Basic of BASIC constant and variables, Expression in BASIC Jumping, Branching, Looping, Subscripted variables simple programme, wring of statistical problems (Mean standard deviation mean deviation, correlation coefficient, Regression coefficient etc.)
- **Linear Programming:** Linear Programming problems, purpose advantages, significance and limitations, solution of LPP, Slack and surplus variables solution of LPP by simplex method use of artificial variables.
- **PRACTICAL**
    1. Measurement of trend by least square and moving average method.
    2. Measurement of seasonal variation by simple average, ratio to trend, ratio to moving average and link relative methods.
    3. Calculation of mortality, fertility and reproduction rates.
    4. Construction life table and Abridged life table.
    5. Formulation of LPP.
    6. Solution of LPP by graphical method and simplex method.
    7. Construction of index numbers and test for index numbers.

SYLLABUS IN ZOOLOGY

- **Protozoa:-** Paramoecium, Porifera- Sycon, Coelenterata- Aurelia
- **Plythelminthes:-** Fasciola, Nemathelminthes- Ascaris, Annelida- Leech
- **Athropoda:-** Prawn, Mollusca- Pila, Echinodermata- Starfish, Coral, Prokaryote and Eukaryote cell types, Ultrastructure of a generallzed animal cell, Mitosis and Meiosis, Mendel's laws of inheritance.
- **Dissections:-** Leech : Alimentary Canal, Excretory and Reproductive System
- **Prawn :** Appendages, digestive system, Nervous system.
- **Pila :** Digestive System, Nervous System.
- **Spotting :-** Porifera : Sycon, Coelenterata, Physalia
- **Annelida :** Neres, Aphorodite,
- **Arthropoda :** Sacculina on carb, Eupagurus
- **Mollusca:** Chiton, Loligo, Octopus, Echinodermata, Starfish, Cytological preparations showing different stages and sub-stages of mitosis and meiosis.
- **Microscopic Preparations :-**
  Preparation of temporary acetocarmine squash slides of grasshopper/sandhopper testis
- **Preparation of permanent slides of materials related to the syllabus:-**
  Paramoecium, Euglena, Gemmule and Spicules of sponges, Mouth parts of insects, Radula of Pila, Balanoglossus, Amphioxus, Poisonous Snakes of India, Blood and its composition, Mechanism of blood Coagulation, Blood Groups.
- **General ideas on the organization of mammalian endocrine system:-**
  Scolidodon- Afferent and efferent franctional arteries, Frog- Arterial and venous system
  Mammal- Blood film preparation, Estimation of total count of RBC,
  WBC andAction of sati very amylase on starch and effect of PH and temperature,Concept of Ecosystem- Component parts- Pond, grass, and, forest as ecosystem, ecosystem-Food chian-food Web-Trophic level's.
- **Ecological Factors:-**
  Lights Temperature, Water, Classification, Structure and properties of carbohydrates, Structure and properties of lipids, Enzyems, Introduction, classification factors affecting enzyme activity, Structure of DNA, RNA structure, types of RNA (mRNA, tRNA, ribosomal RNA (mosty of Prodaryotes), Determination of O2 content in given samples of water, determination of pH in different samples of water by pH paper. Study and comments on aquarium as a model of fresh water ecosystem, Quantitative tests of reducing sugar, carbohydrates, Spermatogenesis, Ogenesis, Ultrastructure of sperm and ovum, Fertilization, Cleavage, pattern in frog, Typer of antigen and antibody, Antigen-antibody reaction, Economically important aquatic animals of Orissa-Fisher, Prawns, Elementary ideas on Sericulture- Apiculture- Life history of honey bee and composition of honey, Study of developmental stages of Frog, Economically important fisher, silk moth life history, honey bee.

SYLLABUS IN PSYCHOLOGY

- Meaning and Development of Psychology, Definition of Psychology, Psychology as a science, the subject matter of Psychology, Development of Psychology as a modern discipline.
- Methods of studying Psychology: Observation method, Experimental method and clinical method.
- Structure and functions of the Brain, Structure and functions of Neurons.
- Perception: Organizing principles of Perception, constancies and illusion.
- Learning: Classical conditioning- Its nature and basic principles,
  Operant conditioning - Its native and basic principles, Observational learning and its basic principles.
- Memory : The information processing approach Sensory Register, Short Term Memory (STM), Long Term Memory.
  Forgetting : Nature and Theories, Problem Solving, Steps in Problem Solving.
- Motivation : Nature and types of motivation.
  Emotion : Nature, Physiology and Expressions of emotion.
- Intelligence : Nature and measurement of intelligence, creativity and intelligence.
  Personality : Freud's theory of Personality, Types and Trait Theories.
- Meaning and concept of Life Span Human Development, Piaget's Theory of Cognitive development.
- Changing conceptions of Psychological disorders (DSM-IV).
  Psychological disorders: Anxiety disorders, Schizophrenia, Mood disorders, somatoform disorder.
- Attitude, Prejudice and Discrimination Meaning and Nature.
- (i) Basics of Statistics :
  Descriptive and Inferential Statistics, Population and sample, Statistic and parameter, Scales of Measurement- Normal, Ordinal, Interval and Ratio.
  Parametric and Nonparametric Statistics, Uses and abuses of Statistics,
  Uses and abuses of Statistics:
  (ii) Frequency distribution, Graphic Presentation of data, measures of Central tendency, Measures of variability, Standard scores.
- Objective Type and Essay type testing Advantages and Limitations Standardized tests Advantages and disadvantages of Standardized tests for use in Classroom Assessment.

SYLLABUS IN GEOLOGY

- **General Geology:** Seismology and internal structure of the earth. **Volcanoes:** Types and distribution.
- **Geomorphology:** Rock weathering and erison, Mass wasting geological work of rivers. Glaciers, wind, underground water and oceans. Geomorphic Cycles-division cycle, Terrain evaluation.
- **Crystrography:** Crystalline and non-crystalline substances, Crystals-defination, characterstics, parameters, indices and zones, symmetry elements and classification of crystals in to seven systems. Study of axials relation, symmetry elements and forms, present in normal classes of all system.
- **Definition and classification of minerals:** Physical properties of minerals, Silicate structure and its classification Isomorpism, polymorphism and Pseudomorphism.
- **Minerals Optics (B):** Istropsim, anisotropism, Optic axisw, Uniaxial and biaxial minerals. Extericton and Extn. Angle. Pleochrosms pleoscheme, Birefringence, interference colours and Twinkling.
- **Structural Geology (A):** Geometry, classification and causes of folding, faults, geometry and classification of faults, Recognisation of folds and faults. Vs rules.
- **Structural Geology (B):** Definition, geological significance, types and recognisation of unconformity.
    - **Mineral Resources of India:** Mineralogy and Use of Fe, Mn, Cr, Cu Ores, Bauxite.
    - **Igneous Petrology (A):** Forms of igneous rocks, texture, structure, Petrographic notes on Basalt, Dolerite, Gabbro, Granite, Pegmatite, Syrite, Dunite, Diorite Peridotite, Carbonatite Anorthosite, Kimberlite.
    - **Metamorphic Petrology (A):** Texture and structure of metamorphic rocks, Petrographic notes on important rock types Schifts, gneiss, marble, quartrite, state and phyllite.
- **Sedimentary Petrology (A):** Texture, Structure of sedimentary rocks
- **Sedimentary Petrology (B):** Petrographic notes on_____shale, limestone, brecia, V's rule, attitude of beds. Fold-geometry, recognisation in field, Fault, recognisation in the field Engineering properties of rocks and soils.
- **Palentology (A):** Mode of preservation of fossils, geological significance of fossils.
- **Palentology (B):** Morphology of the following groups-Trilobite, Brachiopoda, Palecypada, Cephalopada, Echinoidea, Gastropod, Corals, Graptolites.
- **Photogeology and Remote Sensing:** Principles of aerial photography and remote sensing, Application of Aerial photography and remote sensing in mineral exploration, groundwater exploration, and geomorphology, Mineralogy, Fe-ores, Mn, Cr, Pb, Zn, Cu, gold and bauxite, Meneralogy, Mica, Asbestos, diamond, Kyanite, Graphite, Megnestie.