Physical Education

HISTORY, PRINCIPLES AND FOUNDATION OF PHYSICAL EDUCATION-

Meaning, Definition, Scope, Aims and Objective of Physical Education, Important of Physical Education in present era. Physical Education in India (After 1947), Contribution of Akhadas and Vyayamshals. Fitness and wellness movement in the contemporary perspectives, Sports for all and its role in the maintenance and promotion of fitness.

Principle of Physical Education- Biological- Growth and development, Age and gender characteristics, Body Types. Psychological- Attitude, interest, cognition, emotions and sentiments. Sociological- Society and culture, Leadership.

PHYSICAL EDUCATION AND SPORT SCIENCE- PHYSIOLOGY- Definition of physiology and its importance in the field of physical education and sports. Nerve control of muscular activity- Neuromuscular junction, Transmission of nerve impulse across it. Fuel for muscular activity. Role of oxygen-physical training, oxygen debt, second wind, vital capacity. Effect of exercise and training on cardiovascular system. Effect of exercise and training on respiratory system. Effect of exercise and training on muscular system. Physiological concept of physical fitness, warming up, conditioning and fatigue. Basic concept of balanced diet – Diet before, during and after competition.

HEALTH EDUCATION & HEALTH PROBLEMS IN INDIA – Definition of Health, Health Education, Health Instruction, Health Supervision. Aim, objectives and Principles of Health Education, Health Service and guidance instruction in personal hygiene. Communicable and Non Communicable Diseases, Obesity, Malnutrition, Adulteration in food, Environmental sanitation, Explosive Population. Personal and Environmental Hygiene for schools, Objective of school health service, Role of Health Education in School. Health services – Care of skin, Nails, Eye health service, Nutritional service, Health appraisal, Health record, Healthful school environment, first- aid and emergency care etc.

OLYMPIC MOVEMENT -Modern Olympic Games- Significance of Olympic Ideals, Olympic Rings, Olympic Flag. Olympic Protocol for member countries, Olympic Code of Ethics, Olympism in action, Sports for all. Different Olympic Games- Para Olympic Games, Summer Olympics, Winter Olympics, Youth Olympic Games.

Committees of Olympic Games- International Olympic Committee – Structure and Functions. National Olympic committees and their role in Olympic movement, Olympic commission and their functions, Olympic medal winners of India

OFFICIATING AND COACHING –Concept of officiating and coaching. Relation of official and coach with management, players and spectators. Measures of improving the standards of officiating and coaching. Duties of coach in general, pre, during and post game. Philosophy of coaching. Responsibilities of a coach on and off the field. Psychology of competition and coaching. Qualities and qualification of coach and official. General rules of games and sports. Eligibility rules of intercollegiate and inter-university tournaments. Integrity and values of sports.

YOGA EDUCATION- Need and Importance of Yoga in Physical Education and Sports. Basic, applied and action research in Yoga. Difference between yogic practices and physical exercises. Yoga education centers in India and abroad, Competitions in Yogasanas Effect of Asanas and Pranayama on various

system of the body. Classification of asanas with special reference to physical education and sports. Influences of relaxtive, meditatie posture on various system of the body, Types of Bandhas and mudras, Type of Kriyas.

ORGANIZATION AND ADMINISTRATION IN PHYSICAL EDUCATION -Meaning and importance of Organization and Administration in physical education. Qualification and Responsibilities of Physical Education teacher and pupil leader. Planning and their basic principles. Programme planning: Meaning, Importance, Principles of programme planning in physical education. Functions of Planning, organizing, staffing, directing, communicating, co-ordination, controlling, evaluating and innovating.

Office Management, Record, Register & Budged- Office Management: Meaning, definition, functions and kinds of office management. Records and Registers: Maintenance of attendance Register, stock register, cash register, physical efficiency record, Medical examination Record. Budget: Meaning, Importance of Budget making, Criteria of a good Budget, Sources of Income, Expenditure, Preparation of Budget.

Competition Organization- Importance of Tournament, Types of Tournament and its organization structure- Knock-out Tournaments, League or Round Robin Tournaments, Combination Tournament and challenge Tournament. Organization structure of Athletic Meet. Sports Event Intramurals & Extramural Tournament planning.

CONTEMPORARY ISSUES IN PHYSICAL EDUCATION, FITNESS AND WELLNESS

Safety Education and Fitness Promotion- Health and Safety in Daily Life, First Aid and Emergency Care, Common Injuries and their Management, Modern Life Style and Hypo-kinetic Diseases – prevention and Management.

SPORTS NUTRITION AND WEIGHT MANAGEMENT- Meaning of weight management, Concept of weight management in modern era, Factor affecting weight management and values of weight management, Concept of BMI (Body mass index), Obesity and its hazard, Myth of Spot reduction, Dieting versus exercise for weight control, Common Myths about Weight Loss. Obesity – Definition, meaning and types of obesity. Health Risks Associated with Obesity, Obesity – Causes and Solutions for Overcoming Obesity.

Steps of planning of Weight Management- Nutrition – Daily calorie intake and expenditure, Determination of desirable body weight. Balanced diet for Indian School Children, Maintaining a Healthy Lifestyle. Weight management programme for sporty child, Role of diet and exercise in weight management, Design diet plan and exercise schedule for weight gain and loss.

SPORTS TRAINING-Meaning, Definition, Aim, Objective and Principles of Sports Training. System of Sports Training – Basic Performance, Good Performance and High Performance Training.

Training Components- Strength – Mean and Methods of Strength Development. Speed – Mean and Methods of Speed Development. Endurance – Mean and Methods of Endurance Development. Coordination – Mean and Methods of coordination Development. Flexibility – Mean and Methods of Flexibility Development.

Training Programming and planning- Periodization – Meaning and types of Periodization. Aim and Content of Periods – Preparatory, Competition, Transitional etc. Planning – Training session, Talent Identification and Development.

SPORTS MEDICINE, PHYSIOTHERAPY AND REHANLITATION- Sports Medicine: Meaning, Definition, Aims, Objectives, Modern Concepts and Importance. Athletes Care and Rehabilitation: Contribution of Physical Education Teachers and Coaches. Need and Importance of the study of sports injuries in the field of Physical Education, Prevention of injuries in sports, Common sports injuries, Diagnosis. First Aid, Treatment, Laceration, Blisters, Contusion, Strain, Sprain, Fracture, Dislocation and Cramps, Bandages, Types of Bandages: trapping and supports.

Physiotherapy- Definition, Guiding principles of physiotherapy, Importance of physiotherapy, Introduction and demonstration of treatments: Electrotherapy, infrared rays, Ultraviolet rays, short wave diathermy, ultrasonic rays.

Hydrotherapy- Introduction and demonstration of treatments of Cry therapy, Thermo therapy, Contrast Bath, Whirlpool Bath, Steam Bath, Sauna Bath, Hot Water Fomentation, Massage: History of Massage, Classification of Manipulation (Swedish System), Physiological Effect of Massage.

Therapeutic Exercise:- Definition and Scope, Principles of Therapeutic Exercise, Classification, Effects and uses of Therapeutic exercise: Passive Movements (Relaxed, Forced and passive – stretching), Active movements (concentric, Eccentric and static), Application of the therapeutic exercise: Free Mobility Exercise – Shoulder, Elbow, Wrist and Finger Joints, Hips, Knee, ankle and Foot Joints, Trunk, Head and Neck Exercises.

MEASUREMENT AND EVALUATION IN PHYSICAL EDUCATION

Criteria: Classification and Administration of test-Criteria of good Test, Criteria of test, scientific authenticity (reliability, objectivity, validity and availability of norms), Type and classification of Test, Administration of test, advance preparation – Duties during testing – Duties after testing.

Physical Fitness Tests- AAPHER Youth fitness test, National physical Fitness test, Indiana Motor Fitness Test, JCR test, U.S. Army Physical Fitness Test.

Sports Skill Tests- Lockhart and McPherson badminton test, Johnson basketball test, McDonald soccer test, S.A.I volleyball test, S.A.I Hockey test.

THEORY OF SPORTS AND GAMES

General Introduction of specialized games and sports- Athletics, Badminton, Basketball, Cricket, Football, Gymnastic, Hockey, Handball, Kabaddi, Kho-KHo, Tennis, Volleyball and Yoga.

Conditioning exercises and warming up.- Concept of Conditioning and warming up. Role of weight training in games and sports. Teaching of fundamental skill & their mastery (Technique, tactic and different phases of skill acquisition). Recreational and Lead up games. Strategy -offence and defence, Principles of offence and defence.

SPORTS MANAGEMENT- Nature and Concept of Sports Management. Progressive concept of Sports Management. The purpose and scope of Sports Management. Essential skills of Sports Management. Qualities and competencies required for the Sports Manager. Event Manageement in physical education and sports.

COMPUTER SCIENCE

I: Introduction to Computer Science & Information Technology

Introduction, Number System, conversion between number bases, Signed and unsigned nos., concept of overflow.
2's complement arithmetic.

Logic gates, Truth tables, Combinational logic circuits & realization with logic gates, Half & full adders & codes.
Multiplexers.

Demultiplexers, Encoder, Decodes, Code conversion.
Sequential circuits, JK. RS. T. D. Master slave flip flop, Shift registers, Synchronous & asynchronous counters.
Architecture of a simple computer. Architecture of 8085 and 8086. Registers and ALU. Instruction set, Addressing modes, Timing diagram, Fetch decode & execute cycle, Interrupt mechanism, DMA.
Memory hierarchy, RAM types of RAM, ROM, Types of ROM introduction to virtual & cache memory,
Computer programme developing & Algorithm, Flowchart, Pseudo code.

II: Operating System

What is an Operating System? Simple batch systems, Multi programmed batch systems, time – sharing systems parallel systems, Distributed systems, real-time systems.

Computer-System Structure- Computer System Operation I/O structures storage structure, storage hierarchy, and hardware protection.
Operating- System Structure- System components, system services, system calls, system programs, and system structure-simple structure.
Process concept: process state, process control blocks, process scheduling, and Schedulers, threading.

CPU scheduling, CPU-I/O burst cycle, scheduling criteria, scheduling algorithms (Non-pre-emptive-FCFS, SJF pre-emptive-SJF, RR).
Memory management (contiguous Allocation, Paging, Swapping, Segmentation). Virtual memory – Demand paging, page replacement, page replacement algorithms (FIFO, LRU), Thrashing.

File system structures, file allocation (contiguous, linked, indexed), free space management (bit vector, linked list, grouping, counting).

I/O Hardware, polling, interrupts, DMA, spooling, buffering
Disk structure, disk scheduling (FCFS, SSTF, SCAN), disk management – formatting boot block, bad block, swap space management.

Security- The problem, authentication, and program-threats, encryption. Unix commands & shell programming

III: C & DATA STRUCTURE

C **Programming:**

C **language fundamentals:**

Character set, keywords, indentifiers, constants, variables, storage class, Data Types, Operator & expressions.

Header files, Library files

Preprocessor directives

Include and # define

Control flow : Selection & Iteration

Functions : User defined & Library functions

Resursion vs. iteration.

Pointer : Near, Far and Universal pointers

Structure & Union

File Handling

Data Structures

DS Fundamentals

- Definition of Data structure & Storage Structure.
- Classification of Data structures.
- Selection of a Data Structure.

Arrays (vectors and matrices)

- Vectors (1-D arrays)
- Row-major & Column-major storage of a matrix
- Addition of two matrices
- Multiplication of two matrices
- Character array vs. Strings

Stacks

- Array implementation
- Linked-list implementation
- Postfix, Prefix and Infix Notation
- Evaluation of postfix/prefix expression

Queues

- Array implementation
- Linked-list implementation

Linked Lists : Singly, Doubly & Circularly linked list

Graphs : Nomenclature, adjacency lists & adjacency matrix representation of graph.

Trees : Definition & Properties of Binary tree

Pre-order, in-order, post-order and level order

Traversal of binary tree, Binary search tree.

Sorting : Bubble, insertion, Quick & Merge Sort.

Searching : Sequential search & Binary Search.

IV: System Analysis & Design

System development life cycle (SDLC), system analysis – system planning & initial investigation, information gathering, DFD, data dictionary, Decision tree, Feasibility study, cost benefit analysis.

System design – process & stages, I/O & form design, File organization & database design.

System implementation – system fasting & quality anurance, implementation & maintenance, s/w selection

Security, Disaster/Revocery & ethics is system development.

V: Programming in C++

Concepts of OOPS and differences with procedural languages, characteristics of OOPS (Idea of objects, class, data abstraction & encapsulation, inheritance polymorphism, dynamic binding, I/O stream, Cin, count, I/O manipulation).

Data types, operators, control structures & looping statements, functions and arrays.

Objects & classes: classes & objects, constructor, destructor, overloading binary operators, data conversion.

Inheritance: Derived class and base class, protected access specifier, derived class constructors, class hierarchies, abstract base class, public and private inheritance, multiple inheritance, containership (classes within classes).

Pointers: Address and pointers, pointers and arrays, memory management, "New" & "Delete" pointer to objects, linked list, pointer to pointer.

Virtual functions: Virtual functions, friend functions, static functions, "This" pointer.

Files and streams: String, string I/O, object I/O, I/O with multiple objects file pointer, error handling, and redirection.

VI: Database Management System

DATABASE SYSTEM CONCEPTS & ARCHITECTURE :

Data Independence, Schemas, Instances, Database Languages. Database system Environments Data Models. Basic Structure of Oracle System. Storage Organization in Oracle.

DATA MODELING :

Use of High-Level conceptual Data Models, ER Diagrams, Subclasses, Super classes and Inheritance, Specialization & Generalization, Conceptual Object Modeling using UML Class Diagrams. Knowledge Representation Concepts, Exercises.

RELATIONAL DATA MODEL :

Relational Constraints, Domain Constraints, Key Constraints Referential Integrity Constraints, Relational Algebra, Fundamental Operations of Relational Algebra & their Implementation, Interdependence of Operations, Example Queries.

ER AND EER TO RELATIONAL MAPPING :

Mapping EER Model Concepts to Relation. Tuple Relational Calculas, Domain Relational Calculas Queries.

DATABASE DESIGN :

Functional Dependencies, Irreducible Sets of Dependencies, Nonloss Decomposition, 1st , 2nd & 3rd NF. Dependency

Preservation, Boyce Codd NF, Multivalued Dependency & 4th NF. Join Dependency & 5 NF. Domain Key normal Form, Restriction–Union Normal Form, Denormalization.

QUERY PROCESSING AND OPTIMIZATION : SQL –

Basic Queries in SQL, Sub queries, Retrieving a Query Plan – Table Space Span & I/O), Index Scan, Equal Unique Index Lookup. Clustered vs. Non Clustered Indexing, Index Only Scan, Methods for Joining Tables – Nested Loop Join Merge Join, Hybrid Join, Multiple table Join, Transforming Nested Queries to Joins. Object Relational SQL Procedural SQL, Introduction to Embedded SQL.

TRANSACTION-

Schedules, Serializability, Precedence Graph, Concurrency Control Techniques, Implementation of Transactions in Programs, Cursors and Transaction, Dynamic SQL, Locking Levels of Isolation, Recovery, Checkpoints.

DATABASE SECURITY & AUTHORIZATION :

Specifying Privileges , Revoking Privileges, propagation of Privileges, Statistical Database Security.

VII: NETWORKING, DATA COMMUNICATION

Basic network concepts, advantages and disadvantages of computer network, types of networks-LAN, WAN, MAN Network topologies. Hardware requirement of a network, Network operating system.

A communication model, communication tasks, three-layer approach to protocols, brief introduction to TCP/IP and OSI (brief function to different layers).

Data transmission: concept and terminology, analog and digital data transmission, Transmission impairments.

Guided transmission media.

Data encoding digital data digital signal, digital data analog signal, analog data digital.

Signal and analog data analog signal.

Asynchronous & synchronous transmission, interfacing.

Data link control: flow control, error detection (CRC). Error control, High level data control(HDLC).

Multiplexing, statistical time division multiplexing.

Circuit switching: switched network, circuit switching networks, switching concepts, routing in circuit switched networks.

Packet switching: packet switching principals, routing, congestion and control, X.25, Digistra's algorithm, Beliman ford algorithm.

LAN Technology: LAN architecture, Bus/Tree LAN, Ring & Star LANs, Ethernet and fast Ethernet (CSMA/CD) Token ring and FDDI.

Bridges : Bridges operation, routing with bridges

Network Security: Requirements, conventional encryption, public key encryption & digital signature.

VIII: WEB TECHNOLOGY

Dynamic HTML:

Overview to DHTML, Features of DHTML, Document Object Model, Events, Inner Text Property, Dynamically changing Text Attributes (Style sheet and its properties, inline , Embedded, External & Imported Style sheets). Displaying items in Tree structure.

Java Script:

Overview to JavaScript, Features of JavaScript, Variables, Operators, JavaScript Object Hierarchy (window Object & Array). Various events, methods and Objects of JavaScript, Decision making and Loop forming statements, Functions, Creation of Document at Runtime. XML–Introduction to XML, Document Type Definition (DTD), XML Sheema – Declaring attributes Nemespaces, grouping elements & attributes, Rendering XML, Documents – CSS, XSLT; Displaying data with XSLT, displaying data I tabular format, using HTML, Tags within XSLT, XML Document object model – objects & methods, using XML, OOM objects in scripts.

Active Server Page :

Overview to ASP, Creation of Virtual Directory, Active Data object, ADO Connection with MS-Access, ADO Command object and Query, Creation of Record set, Execute method of command object, Open method of Record set Object, Execute method of Connection Object, Insertion, Deletion and Modification of Data in a Database.

IX: JAVA PROGRAMMING

Introduction to Java: History of Java, Features of Java, types of Java Programs
JDK Tools: Javac Compiler, Java Interpreter, applet viewer, Job tool, Javap Diassember, Javadsc Tool, Javah Tool, Java Keywords, Data types in Java, Variable naming conventions, Initialising variables, Literals, operators, Type conversion, Decision construct, Looping construct, Arrays.

Classes ad objects: Declaring classes, Creating objects, Declaring objects, Declaring methods, Passing arguments to methods, Constructors, Access specifiers, Modifiers, The main ( ) method, Overloading, Relationship between classes.

Applets & Applications: Applet class, Applet & HTML, Life cycle of a Applet, Graphic class, Font class, Passing parameters to Applets, Creating an application, Converting applets to application.
Introduction to threads: Threads, Single threaded and multithreaded applications, life cycle of a Thread, the current thread, the thread class, Problems in multithreading.
Packages: Java packages, using a package, the Lang packages, the package, the collection Class, creating a package, Data base connectivity using JDBC (Preferably oracle).

Zoology

I. Animal Diversity (Non chordates)

1. Principle of classification: Salient features sand Classification of Non-chordates upto orders. Structural organization in different classes of Non-chordates.
2. Protozoa: Type study (Paramecium) and Study of locomotion, Osmoregulation, Nutrition and Reproduction in Protozoa.
3. Porifera and Coelenterate: Type study (Sycon and obelia), Canal system in Porifera, Corals and Coral reefs, Polymorphism in Hydrozoa.
4. Ctenophora: Affinities, type study (Pleurobranchia).
5. Platyhelminthes and Nemathelminthes: Type study (Fasciola and Ascaris), Reproduction and Parasitic Adaptations.
6. Annelida: Coelom and Excretory system, Type study (Earthworm)
7. Mollusca: Type Study (Pila), Torsion and Detorsion in gastropoda.
8. Onychophora: type stydy (Peripatus) and Affinities.
9. Arthropoda: Larval forms in Crustacea, Vision in Arthropoda, Type study (Palaemon).
10. Echinodermata: Water vascular system and Larval froms.

II. Cell Biology

1. Diversity of cell size and shape.
2. Cell theory (04)
3. Structure of Prokaryotic and Eukaryotic cells.
4. Microscopic techniques for the study of the following cell.
5. Structure and function of the following cell organelles: Plasmamembrane, Golgi body, Endoplasmic reticulum Mitochondria, Lysosome, Ribosome, Nucleus And Nucleolus.
6. Cellular energy transaction: Role of Mitochondria.
7. Membrane transport of small molecules, and the Ionic basis of the Membrane Excitability.
8. Cell secretion.
9. Cytoskeleton.
10. Cell junctions, Cell adhesion and the Extracellular matrix.
11. Cell differentiation
12. Biology of Cancer (elementary idea)

III. Animal Diversity Chordates and Physiology

A. Animal Diversity (Chordates)

1. Origin and general characters of chordates.
2. Protochordates: Structural organization of Hemichordates. Urochordates and Cephalochordates.
3. Fishes: Parental care and Accessory Respiratory organs.
4. Amphibians: Origin of land vertebrates. Classification up to orders, parental care.
5. Reptiles: Classification living reptiles up to orders, biting and feeding mechanism of snakes.
6. Origin of birds, Flight adaptation. Bird migration
7. Ratitae: Distribution and Classification.

8. Mammals: Classification and General characters.
9. Comparative anatomy of systems (kidney, heart, aortic arches).

B. Physiology

1. Blood: Composition and Function of blood and lymph blood groups, Blood coagulation, Structure and Function of Haemoglobin
2. Respiration: Mechanism and Control of breathing transport of O_2 and CO_2
3. Digestion and Absorption of dietary components.
4. Structure and function of the kidney, Physiology of urine formation.
5. Physiology of nerve conduction.

IV. Vetebrate Endocrinology, Reproductive biology, Evolution and Behaviour

A. Vertebrate endocrinology and Reproductive biology

1. Concept of Endocrinology.
2. Structure, Histology and Physiology of Pituitary, Thyroid Adrenal, Islets of Langerhans, Gonads, Pineal and Thymus.
3. Reproductive cycles in mammals.
4. Hormonal regulation of Reproductive cycles in mammals.
5. Accessory sex organs & their Dependence on steroid hormones
6. Endocrine disorder: Brief description of Goiter formation, Addison's diseases, Cushings disease, Diabetes.

B. Evolution and Behaviour

1. Origin of life on earth
2. Variations, Mutations, Recombination, Polyploidy, Isolation, Natural selection
3. Concept of species and speciation
4. Phylogeny of horse
5. Genetic drift, Hardy-Weinberg law
6. Zoogeographical realms and characteristic fauna
7. Macro and Microevolution, Evolution of man
8. Introduction to Ethology
9. Patterns of behaviour
10. Social organization in Honeybees
11. Drugs and behaviour

V. Environmental biology and Toxicology

Group – A

1. Aim and scope of Ecology
2. Concept of Ecosystem.
3. Principles of Adaptation to External factors (eg: light, Temperature and Carbon dioxide), Concept of limiting factors
4. Communities and development: Ecological succession, Niche concept, Major biomes (Tropical, Temperature, Alpine tundra, Desert, Grassland)
5. Biogeochemical Cycles (types, water cycle, carbon cycle), and organisms
6. Energy flow in Ecosystems, Food chain, Food web, and Tropic levels
7. Conservation of natural resources, wild life management

Group B:

1. Populations: Characteristics, Growth And its Analysis, Regulation Of Densities

2. Association and Integration among organisms: Intraspecific and Interspecific Interactions: Commensalisms, Mutualism, Parasitism (Evolution Of Parasitism, Host-Parasite Relationship), Predation (Evolution Of Prey-Predator Strategies, Prey-Predator interaction)
3. Environmental pollution: Air, Water and Soil, Control strategies
4. Environmental toxicology: Introduction Definition, Classification, Toxic Agents (Food additives, Pesticides, Metals, Solvents, Radiation, Carcinogens and Poisons), Xenobiotics
5. Statistical methods in toxicology, Applications of toxicology (assessment of LC 50, LD 50)
6. Anthropogenic Activity and Environment
7. Environmental policy
8. Environmental Impact Assessment

VI. Genetics, Immunology, Biochemistry and Molecular Biology

A. Genetics and Immunology, Biochemistry and Molecular Biology

1. Mendelian inheritance pattern and Laws of heredity.
2. Co-dominance and incomplete dominance
3. Linkage and linkage maps
4. Varieties of Gene expression: Multiple alleles, Lethal genes Pleiotropic genes, Gene interactions, Epistasis.
5. Sex chromosome systems and sex linkage
6. Non-chromosomal inheritance
7. Mutations and Chromosomal Aberrations, Meiotic sequences
8. Human genetics: chromosomal and single gene disorders (autosomal and sex), genetic counselling, somatic cell genetics.
9. Gene mapping and Genome analysis
10. Concept of Immune system

B. biochemistry and molecular biology

1. Structure and classification of Proteins and Amino acids.
2. Structure and classification of Carbohydrates.
3. Structure and classification of Lipids.
4. Metabolism of carbohydrates: Glycolysis, Glycogenesis, Krebs cycle,
5. Discovery, Sturcture and Function of Vitamins.
6. Enzymes: Nature and Classification.
7. Nucleic acids & Nucleotides: Structural properties & Functions.
8. Genes and Chromosomes: Nature of Genetic material, Central dogma.
9. Protein Biosynthesis: Basic details.
10. Regulation of Gene expression: General Principles.
11. Organization of DNA: Viral, Bacterial and Eukaryotic, Split genes and Transposons.
12. DNA replication: General principles, Enzymes and Inhibitors.
13. DNA Repair Mechanisms.
14. DNA Transcription: Basic details.

VII. Development Biology and Applied Zoology.

A. Developmental Biology

1. Gametogenesis: spermatogenesis and oogenesis vitellogenesis, egg membranes
2. Fertilization: Sperm-Egg interaction, Biochemical events, Post-fertilization events.
3. Parthenogenesis.
4. Types of Animal eggs: Patterns of cleavage, Gastrulation, Fate maps and cell lineage.
5. Extra-embryonmic membranes, Types and Physiology of placenta.
6. Organizer concept, induction.
7. Ageing

B. Applied Zoology

Any of the following suggested applied topics should be taken:

(a) Bioinformatics.
(b) Reproductive technologies.
(c) Aquaculture.
(d) Medical Zoology.
(e) Biotechnology,

(a) Bioinformatics

1. Historical perpectives on computers and their applications to biology.
2. Operating systems: DOS, WINDOWS, UNIX.
3. Introduction to programming.
4. The internet and the biologist.
5. Data bases and information retrieval.
6. Sequence analysis: basic concepts and operational aspects,
7. Phylogenetic analysis.
8. Predictive methods based on sequence data.
9. Genome information.
10. Programming using C, C data types, C assignment statements.
11. One dimensional arrays.
12. Strings and C string libraries.
13. Structures and Unions.

(b) Reproductive technologies

1. Gamete technology: Gemetogenesis in Economically Important invertebrates and vertebrates. Collection and cryopreservation of gametes and embryos.
2. Sperm function, Tests and Semen analysis, In-vitro fertilization and Embryo transfer.
3. Immunocontraception, vaccines.
4. Hormone assays: Bioassay and Immunoassay, RIA and ELISA, Immunodiagonostics for Pregnancy, Cancer and reproductive tract infections.
5. Embryosexing: Methods and Principles.
6. Animal house-design, Breeding and Maintenance of animals, Production of transgenic animals.
7. Embryocloning and cloning of animals by nuclear transfer.

(c) Aquaculture

1. World Aquaculture-role, Importance, Status, Production trend, Important species, Current concepts of culturable Fin fishes and Shell fishes.
2. Micronutrients.
3. World fishes: Production, Utilization and Demand.
4. Marine fisheries of India, Pelagic and Demersal, Fishery resources, Their exploitation, Area, Seasons, Production, Efforts, Utilization, Demand and potential, Resources.
5. Estuarine and Brackish water fishes of India: Charateristic Species and their exploitation.
6. Freshwater fishes of India: River systems, Reservoir, Pond, Tank fisheries, Captive and culture fisheries, Cold water fisheries.
7. Fishing craft and Gear
8. Finfishes, Crustaceans, Mollusks and their culture.
9. Sea weed culture.
10. Fish Seed production: seed resources and its Assessment, Collection, Hatchery production.
11. Field culture: Ponds, Running water, Recycled water, Cage culture, Pen culture, Sea ranching and Artificial recruitment, Culture site and its requirement, Nursery and Growout pond: Preparation, Management, Fertilization, Stocking, Feeding, Monitoring and Management, Poly culture farm construction.
12. Culture Technology: Biotechnology using chromosomal and Gene manipulation, Transgenic fish, Supermales, Artificial Insemination, Cry preservation of gametes & Embryos, Economics of production.

(d) Medical Zoology

1. Introduction to parasitology.
2. Brief introduction to Pathogenic microbes: Viruses, Rickettsiae, Spirochaetes and Bacteria.
3. Brief account of the life history, Mode of infection and Pathogenecity of the following pathogens with reference to man, prophilaxis and treatment:
   (a) Pathogenic Protozoans: *Entamoeba, Trypanosoma, Leishmania, Giardia, Trichomonas and Plasmodium.*
   (b) Pathogenic Helminthes: *Schistosoma, Ancyclostoma and Wuchereria.*
4. Brief accout of Arthropods as direct agents of disease of Discomfort; Accidental injury to sense organs; Blood loss; Entomophobia; Dermatosis; Myiasis; Allergy and Venoms.
5. Arthropods as vectors of Human diseases: Malaria, Yellow fever, Filariasis and Plague. Distribution biology and control of the above mentioned vectors.
6. Histopathological changes in organs in relation to diseases such as liver cirrhosis, Nephrosis, Tumors and Cancer.
7. Epidemic diseases such as: Typhoid, Cholera, Small pox; their occurrence and Eradication programs.
8. Elementary idea of Drug therapy and Drug resistance.
9. Brief introduction to Human Defense Mechanism.

(e) Biotechnology

1. Basic concepts in Genetic engineering.
2. Enzymology of Genetic engineering: Restriction enzymes: DNA ligase, Polymerase etc.
3. Cloning vehicles: Plasmids, Cosmids, Lambda Phage, Charon Phage, Shuttle vectors etc.
4. Introduction of cloned genes into the host cells: Transformation, Transduction, Particle gun, Electroporation, Liposome mediated, Cultivation etc.
5. Analysis and expression of cloned genes in host cells: Restriction enzymes analysis, Southern blotting, Northern blotting, In situ hybridization, DNA sequencing, DNA probes, Antisense RNA, Expression of cloned genes.
6. Introductory idea about Gene libraries.
7. Transferring genes into animal Oocytes, Eggs, Embryos, and specific animal tissues.
8. Application and Impact of DNA technology.
9. Ethical issues and Safety Regulations.

(Botany)

DIVERSITY & CLASSIFICATION OF PLANT KINGDOM AND BIOLOGY OF CRYPTOGAMS

1. Classification of kingdoms and the criteria
   (according to Mayr, the 7 Kingdoms of living organisms):
   Diversity in habitat, form, life span, nutrition and ecological status
2. Origin, Evolution and phylogeny of land plants
3. Extinctions and possible causes of fossilization
   (a brief account)
4. General characters and Classification of Algae up to Orders
5. General characters and Classification of Fungi up to Orders
6. Structure, life history, economic importance and
   evolutionary affinities of the following genera:

(a) **ALGAE** : Nostoc, Gloeotrichia, , Spirulina,
Chlamydomonas, Volvox, Oedogonium,
Coleochaete, Nitella, Vaucheria, Ectocarpus, Fucus, Polysiphonia,

(b) **FUNGI** : Synchytrium, Albugo, Erysiphe,
Claviceps, Peziza, Ustilago, Puccinia,
Alternaria, Cercospora, Agaricus, Mushroom cultivation

(c) **LICHEN** : General account, classification, and its economic importance

7. Structure, life history, affinities and importance of the genera mentioned below:
   (a) **BRYOPHYTA** : Marchantia, Plagiochasma, Targionia, Cyathodium, Anthoceros, Notothylus, Sphagnum, Pogonatum, Funaria.
   (b) **PTERIODOPHYTA:** Psilotum, Lycopodium, Selaginella, Equisetum, Ophiogolossum, Marsilea, Azolla, Pteris.
   (c) **FOSSIL:** Rhynia, Lepidodendron, Calamites.

(MICROBIOLOGY AND PLANT PATHOLOGY)

(MICROBIOLOGY)

Topic

1. Discovery of Microorganisms: Systematic position of microorganisms
   In biological world, classification of microorganisms and characteristics
   of different groups.
2. Methods in microbiology: Basic principle of microscopy, micrometry, staining, sterilization methods, culture media, pure culture method, methods for population estimation.
3. Modern concept about bacterial cell structure

4. Bacterial reproduction: transformation, transduction, conjugation
5. Structure and nature of TMV and Bacteriophage and their replication.
6. Role of microbes in nitrogen fixation: organic matter decomposition
7. Industrial importance of microorganisms
8. General account of Mycoplasma and diseases caused by them

(PLANT PATHOLOGY)

9. General account of plant pathogens: historical developments: general account of disease caused by plant pathogens:
10. Important plant diseases of Jharkhand: Etiology, symptoms and control of the following diseases:
    1. Late blight of potato
    2. Loose smut of wheat
    3. Rust of linseed
    4. Red rot of sugar cane
    5. Wilt of tomato
    6. Citrus canker (*Xanthomonas campestris* pv. *citri*)
    7. Bacterial blight of paddy (*Xathomonas campestris* pv. *oryzae*)
    8. Tundu disease of wheat
    9. Little leaf of brinjal
    10. Tobacco mosaic virus
    11. Pathogen attack and defense mechanisms: physical, Physiological, biochemical and molecular aspects
    12. Plant disease management: chemical, biological, Development of transgenics, biopesticides.

(Gymnosperm and Systematics of Angiosperm)

GYMNOSPERM

Topic

1. Comparative study at the morphological, anatomical, embryological and evolutionary features of the following genera: Pinus, Taxus, Ginkgo, Gnetum

2. Palaeobotany:
   (a) A brief idea about geological era
   (b) Definition of Fossil, process and conditions of fossilization
   (c) Detailed study of Lyginopteris and Cycadeoidea
   (d) A brief idea about the Plant Fossils of Rajmahal area

SYSTEMATICS OF ANGIOSPERMS

1. Principles of Plant Taxonomy and a knowledge of Classification of plants as proposed by Bentham & Hooker; Engler & Prantle, Hutchinson and Takhtajan
2. Idea about important rules of plant nomenclature with special reference to ICBN
3. Modern trends in plant taxonomy: Taxonomy in relation to Anatomy, Embryology, Palynology, Cytology

4. A comparative account of diagnostic features, relationship and economic importance of the following families: Ranunculaceae, Euphorbiaceae, Rubiaceae, Verbenaceae, Apocynaceae, Scrophulariaceae, Acanthaceae, Asclepiadaceae, Labiateae, Anacardiaceae, Cyperaceae.,Poaceae, Orchidaceae

DEVELOPMENT OF PLANTS

1. Mechanical tissues: structure, distribution and function
2. Organization of tissue in relation to environment (Ecological anatomy)
3. Meristem: shoot apex organization: initiation, structure and function of cambium
4. Anomalous secondary growth in Begonia, Nyctanthus, Boerhaavia, Tecoma, and Dracaena
5. Periderm: origin, structure and function

UTILIZATION OF PLANTS

1. Use of plants as medicine and ideas about important drug-yielding plants
2. Agricultural and horticultural plants and their products of Jharkhand with special reference to oilseeds, pulses, fruits, vegetables and timbers
3. Utilization of waste and biogas resources
4. Underutilized plants: future resources

EMBRYOLOGY

1. Embryology: Basic concepts and methodology
2. Microsporogenesis
3. Male gametophyte
4. Macrosporogenesis
5. Female gametophyte (Types of embryo sacs)
6. Fertilization
7. Endosperm
8. Embryogeny
9. Polyembryony
10. Experimental embryology

(Plant Physiology, Biochemistry and Biotechnology)

PLANT PHYSIOLOGY

1. Plant-water relation: diffusion and osmosis, water potential and Chemical potential, absorption of water, ascent of sap, transpiration, mechanism of stomatal movement.
2. Mineral nutrition: nutrient uptake and transport mechanisms, role of carriers .
3. Photosynthesis: Photosynthetic apparatus, pigments, photochemical reactions, electron transport pathways in chloroplast membranes, photophosphorylation, Calvin Cycle, Crassulacean Acid Metabolism,

Hatch & Slack pathway, Photorespiration.

4. Transport of organic substances, path of translocation, Mechanism of translocation.
5. Respiration: Glycolysis, TCA cycle and its regulation, electron transport in mitochondria, oxidative phosphorylation, Pentose phosphate pathway
6. Biological nitrogen fixation reduction of N_2 into NH_3
7. Phytohormones: General account, discovery, structure and mechanism of action, and roles of Auxins, Cytokinins, Gibberellins, Abscissic acid and Ethylene.
8. Physiology of flowering, photoperiodism, vernalization, role of pigments and hormones.
9. Physiology of tropic and nastic movement in plants.

BIOCHEMISTRY & BIOTECHNOLOGY

1. Plant cell organelles and their roles: Mitochondria, chloroplast, peroxisome, glyoxysome, ribosome, nucleus.
2. Aminoacids and peptides: Types of amino acids, structure of proteins and protein synthesis.
3. Enzymes: nature; properties, types, classification, mechanism of action, factors of enzyme activities.
4. Lipid : Nature, types of fatty acids, biosynthesis and metabolism of lipids (β-oxidation)
5. Cell wall, cell membrane and their biochemical properties.
6. Morphogenesis, photomorphogenesis, phytochrome.
7. Role of plant tissue culture in growth, development and differentiation , totipotency, organogenesis, embryogenesis.
8. Protoplast culture and somatic hybridization.
9. Micropropagation.
10. Genetic engineering in plants and future of plant biotechnology.

(CYTOGENETICS, PLANT BREEDING AND MOLECULAR BIOLOGY)

CYTOGENETICS AND PLANT BREEDING

1. Cell division, its regulation and significance: Mitosis and Meiosis.
2. Morphology of chromosomes including lampbrush chromosomes β-chromosome and polytene chromosomes.
3. Mendel's experiments and principles of inheritance: back cross and test cross; gene interactions and modified dihybrid ratios—complementary, supplementary, duplicate and epistatic factors.
4. Quantitative genetics: quantitative traits and quantitative genetics; the multiple factor hypothesis; descriptive statistics.
5. Linkage and recombination: coupling and repulsion phases; two and three point test crosses with their significance in chromosome mapping; interference and co-efficient of coincidence.

6. Cytoplasmic inheritance: shell coiling in snails, kappa particles in Paramecium, mitochondria in yeast and plastids in *Mirabilis jalapa*.
7. Alteration in genetic make up-changes at genetic level: spontaneous and induced mutation; mutagens – types and mode of action; transitions, transversions and frame shift mutation; detection of mutations.
8. Alteration in genetic make up-changes in chromosome structure; origin, types and effects of duplications and deletions and inversions and translocations.
9. Alteration in genetic make up-changes in chromosome numbers; origin, types and effects of auto and allopolyploidy; origin and meiosis in nullisomics, monosomics and trisomics.
10. Genetic Code.
11. Methods of plant breeding.
12. Role of plant breeding in crop improvement.

MOLECULAR BIOLOGY

1. Nucleic acids: compositions of nucleic acids and synthesis of nucleotides; DNA structure; A,B,Z forms of DNA; denaturation and renaturation of DNA; chromatin structure; DNA replication and recombination. DNA polymerases; different forms of RNA and their role.
2. Gene Structure, expression and regulation: gene organization in prokaryotes and eukaryotes; operon concept; gene regulation in prokaryotes and eukaryotes; inducible, repressible, positive and negative gene regulation. Interrupted genes in eukaryotes; RNA splicing; messenger RNA stability.
3. Recombinant DNA technology; restriction endonucleases; prokaryotic and eukaryotic cloning vectors; genomic and DNA libraries. Southern and northern analysis; various techniques of gene mapping and DNA fingerprinting (RELP. RAPD, AFLP); chromosome walking; polymerase chain reaction; DNA sequencing.
4. Genetic engineering; vectors for gene delivery; selectable markers and reporter genes; method of gene delivery ; Agrobacterium – the natural genetic engineer; salient achievements in crop biotechnology (with suitable examples) and prospects.

(ECOLOGY AND ENVIRONMENTAL BIOLOGY)

ECOLOGY

1. Autecology and synecology, biological spectrum , production ecology.
2. Ecological factors: climatic, edaphic, topographical and biotic factors.
3. Population ecology: Characteristics and acquaintance with population models.
4. Community structure, types of ecosystem (grassland, aquatic and forest and ecological pyramids.
5. Community dynamics; Succession, xerosere, hydrosere, concept of climax, Community.

ENVIRONMENTAL BIOLOGY

1. Soil types, formation, physiochemical nature, water holding capacity, soil profile and soil erosion and conservation.
2. Non-conventional source of energy.

3. Biodiversity and its conservation.
4. MAB programme, resource ecology, plant indicators.
5. Environmental pollution: air pollution, water pollution, sound pollution, nuclear pollution and their control measures.
6. Major vegetational belts of India.
7. Environmental management: soil, water and air .
8. Bioindicators.

CHEMISTRY

PHYSICAL CHEMISTRY

I. Gaseous States

Postulates of kinetic theory of gases, deviation from ideal behavior, van der Waals equation of state. Critical Phenomena; PV Isotherms of real gases, continuity of states, Van der Waals equation, relationship between critical constants and van der Waals constant, the law of corresponding stats, reduced equation of states. Molecular Velocities; Root mean square, average and most probable velocities. Qualitative discussion of Maxwell's distribution of molecular Velocities, collision number, mean free path and collision diameter. Liquification of gases (based on Joule – Thomsom effect).

II. Liquid State

Intermolecular forces, structure of liquids (a qualitative description). Structural differences between solids, liquids and gases. Liquid crystals: Difference between liquid crystal, solid and liquid.

III. Solid State

Definition of space lattice, unit cell. Laws of crystallography- (i) Law of constancy of interfacial angles (ii) Law of rationality of indices (iii) Law of symmetry. Symmetry elements in crystals. X-ray diffraction by crystals. Derivation of Bragg equation. Determination of crystal structure of NaCl, KCl and CsCl (Laue's method and powder method).

IV. Colloidal State

Definition of colloids, classification of colloids. Solids in liquids (sols): properties – kinetic, optical and electrical; stability of colloids, protective action, Hardy-Schulze law, gold number. Liquids in liquids (emulsions): types of emulsions, preparation. Emulsifier. Liquids in solids (gels): classification, preparation and properties, inhibition, general applications of colloids.

V. Chemical Kinetics and Catalysis

Chemical Kinetics and its scope, rate of reaction, factors influencing the rate of a reaction-concentration, temperature, pressure, solvent, light, catalyst. Concentration dependence of rates, mathematical characteristics of simple chemical reactions- zero order, first order, second order, pseudo order, half life and mean life. Determination of the order of reaction, method: method of integration, method of half life period and isolation method. Theories of chemical kinetics: effect of temperature on rate of reaction, Arrhenius equation,concept of activation energy, Simple collision theory based on hard sphere model, transition state theory (equilibrium hypothesis). Expression for the rate constant based on equilibrium constant and thermodynamic aspects. Catalysis, characteristics of catalyzed reactions classification of catalysis, miscellaneous examples.

VI Thermodynamics

Definition of thermodynamics terms: systems, surroundings etc. Types of systems, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Concept of heat and work. First Law of Thermodynamics. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule's law-Joule- Thomson coefficient and inversion temperature. Expansion of ideal gases under isothermal and adiabatic conditions for reversible process. Thermochemistry : standard state, standard enthalpy of formation- Hess's Law of heat summation and its applications. Bond dissociation energy and its calculation from thermochemical data, temperature dependence of enthalpy. Kirchhoff's equation. Second law of thermodynamics, Carnot theorem. Thermodynamic scale of temperature. Concept of entropy, entropy as a state function, Clausius inequality , entropy as a criteria of spontaneity and equilibrium, Entropy change in ideal gases and mixing of gases. Third law of thermodynamics: Nernst heat theorem, statement and concept of residual entropy. Gibbs and Hehmholtz functions; Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, A & G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change.

VII Chemical Equilibrium

Equilibrium constant and free energy. Thermodynamic derivation of law of mass action. Le-Chatelier's principle Reaction isotherm and reaction isochore-Clapeyron equation and Clausius- Clapeyron equation, applications.

VIII Phase Equilibrium

Phase, component and degree of freedom, derivation of Gibbs phase rule, phase equilibria of one component system-water and S systems. Phase equilibria of two component system –($FeCL_3$-H_2O) systems. Liquid-liquid mixtures-Ideal liquid mixtures, Raoult's and Henry's law. Non-ideal system-azeoptropes – HCl-H_2O and ethanol – water systems. Partially miscible liquids – Phenol- water, Nernst distribution law- thermodynamic derivation, applications.

IX Physical properties & Molecular structure

Parachore, Refractive index & Molecular refractivity. Dipole moment. Magnetic properties and Magnetic Susceptibility. Additive & Constitutive Properties and their uses in elucidation of molecular structure.

X Electrochemistry

Electrical transport-conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance effect of dilution. Migration of ions and Kohlrausch law. Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law its uses and limitations. Transport number, definition and determination by Hittorf method and moving boundary method. Types of reversible electrodes. Electrode reactions, Nernst equation, derivation of cell E.M.F. and single electrode potential, standard hydrogen electrode-reference electrodes-standard electrode potential, sign

conventions, electrochemical series and its significance. Electrolytic and Galvanic cells - reversible and irreversible cells, conventional representation of electro-chemical cells. EMF of a cell and its measurements. Computation of cell EMF. Calculation of thermodynamic quantities of cell reactions (G, H and K), polarization, over potential and hydrogen overvoltage. Concentration cell with and without transport, liquid junction potential, application of concentration cells.

XI **Surface Chemistry**

Adsorption difference between absorption and adsorption. Free energy, isotherm, Frendlich and Langmuir's adsorption isotherms. Qualitative treatment of BET isotherm and its application to surface area measurement.

INORGANIC CHEMISTRY

I **Elementary Quantum Mechanics**

Black-body radiation, Planck's radiation law, photoelectric effect, heat capacity of solids, Bohr's model of hydrogen atom (no derivation) and its defects, Compton effect. Sinusoidal wave equation, Hamiltonian operator, Schrodinger wave equation, Hamiltonian operator, Schrödinger wave equation and its importance, physical interpretation of the wave function, postulates of quantum mechanics, particle in a one dimensional box. Schrodinger wave equation for H-atom, separation into three equations (without derivation), quantum numbers and their importance, hydrogen like wave functions, radial wave functions, angular wave functions.

II **Chemical Bonding**

Covalent Bond – Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions. Valence shell electron pair repulsion (VSEPR) theory multicenter bonding in electron deficient molecules, bond strength and bond percentage ionic character from dipole moment and electro negativity difference. Fajan's rule. Metallic bond-free electron, valence bond and band theories.

Molecular orbital theory, basic ideas-criteria for forming M.O from A.O, construction of M.O's by LCAO, physical picture of bonding and anti bonding wave function, concept of Symmetric and anti symmetric orbitals and their characteristics. Hybrid orbitals- **sp, sp2, sp3** calculation of coefficient of AO'S used in these hybrid orbitals.
Introduction to valence bond model of H_2, comparison of M.O and VB models.

III **Chemistry of Elements of First Transition Series**

Characteristic properties of d-block elements. Properties of the elements of the first transition series their binary compounds and complexes illustrating relative stability of their oxidation states, coordination number and geometry.

IV **Chemistry of Elements of Second and Third Transition Series**

General characteristic comparative treatment with their 3d-analogues in respect of ionic radii, oxidation states, magnetic behavior, spectral properties and stereochemistry.

V **Oxidation and Reduction**
Use of redox potential data – analysis of redox cycle, redox stability in water-Frost, Latimer and Pourbaix diagrams. Principles involved in the extraction of the elements.

VI **Coordination Compounds**
Werner's coordination theory and its experimental verification, effective atomic number concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory of transition metal complexes.

VII **Chemistry of Lanthanide Elements**
Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

VIII **Chemistry of Actinides**
General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from U, similarities between the later actinides and the later lanthanides.

IX **Acids and Bases**
Arrhenius, Bronsted-Lowry, the Lux-Flood, solvent system and Lewis concepts of acids and bases. HSAB Concept.

X **Non-Aqueous Solvent**
Physical properties of a solvent, types of solvents and their general characteristics, reactions in non-aqueous solvents with reference to liquid NH_3 and liquid SO_2.

ORGANIC CHEMISTRY

I **Structure and Bonding**
Hybridization, bond lengths and bond angles, bond energy, localized and delocalized chemical bond, van der Waals interactions, inclusion compounds, clatherates, charge transfer complexes, resonance, hyperconjugation, aromaticity, inductive and field effects, hydrogen bonding.

II **Mechanism of Organic Reactions**
Homolytic and heterolytic bond breaking. Types of reagents –electrophiles and nucleophiles. Types of organic reactions. Energy considerations. Reactive intermediates- carbocations, carbanions, free radicals, carbenes, arynes and nitrenes (with examples). Assigning formal charges on intermediates and other ionic species. Methods of determination of reaction mechanism (product analysis, intermediates, isotope effects, Kinetic And Stereochemical Studies)

III **Stereochemistry of Organic Compounds**
Optical isomerism-elements of symmetry, molecular chirality, enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization. Relative and absolute configuration, sequence rules, D & L and R & S systems of nomenclature. Geometric isomerism-determination of configuration of geometric isomers. E & Z system of nomenclature. Geometric isomerism in oximes and alicyclic compounds. Conformational isomerism- conformational analysis of ethane and n-butane;

Conformations of cycohexane, axial and equatorial bonds, conformation of mono substituted cyclohexane derivatives. Newman projection and Sawhorse formulae, Fischer and flying wedge formulae. Difference between configuration and conformation.

IV **Alkenes, Cycloakenes, Dienes and Alkynes**

Nomenclature of alkenes, methods of formation, mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides, regioselectivity in alcohol dehydration. The Saytzeff rule, Hoffmann elimnation, physical properties and relative stabilities of alkenes. Chemical reactions ofalkenes-mechanisms involved in hydrogenation. Electrophilic and free radical additions, Markownikoff ' s rule, hydroboration-oxidation,oxymercuration-reduction. Epoxidation, Ozonolysis, hydration, hydroxylation and oxidation with KMnO4. Polymerization of alkenes.

Substitution at the allylic and vinylic positions of alkenes. Industrial applications of ethylene and propane. Methods of formation, conformation and chemical reactions of cycloalkenes. Nomenclature and classification of dienes: isolated. Conjugated and cumulated dienes. Structure of allenes and butadiene, methods of formation.

V **Arenes and Aromaticity**

Nomenclature of benzene derivatives. The aryl group. Aromatic nucleus and side chain. Structure of benzene: molecular formula and Kekule structure. Stability and carbo-carbon bond lengths of benzene, resonance structure, M.O picture. Aromatic electrophilic substitution – general pattern of the mechanism, Mechanism of nitration, halogenations, sulphonation, mercuration and Friedel- Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/para ratio. Side chain reactions of benezene derivatives. Birch reduction. Methods of formation and chemical reactions of alkylbenzenes, alkynylbenzenes and biphenyl.

VI **Aldehydes and Ketones**

Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis, of ketones from nitriles and from carboxylic acids. Physical properties. Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin aldol. Perkin and Knoevenagel condensations, Codensation with ammonia and its derivatives, Wittig reaction. Mannic reaction. Use of acetals as protecting group. Oxidation of aldehydes, Baeyer-Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, $LiAlH4_4$ and $NaBH_4$ sreductions. Halogenation of enolizable ketones. An introduction to unsaturated aldehydes and ketones.

VII **Carboxylic Acids**

Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength. Preparation of carboxylic acids. Reactions of car boxylic acids. Hell-Volhard-Zelinsky reaction. Synthesis of acid chlorides, esters and amides. Reduction of carboxylic acids. Mechanism o decarboxylation. Methods of formation and chemical reactions of halo acids. Hydroxy acids: malic, tartaric and citric

acids. Methods of formation and chemical reactions of unsaturated monocarboxylic acids. Dicarboxylic acids: methods of formation and effect of heat and dehydrating agents.

VIII Carboxylic Acid Derivatives

Structure and nomenclature of acid chlorides, amides (urea) and acid anhydrides. Relative stability of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution. Preparation of carboxylic acid derivatives, chemical reactions. Mechanisms of esterification and hydrolysis (acidic and basic).

IX Carbohydrates

Classification and nomenclature. Monosaccharides, mechanism of osazone formation, interconversion of glucose and fructose, chain lengthening and chain shortening of aldoses. Configuration of monosaccharides. Erythro and threo diastereomers. Conversion of glucose into mannose. Formation of glycosides, ethers and esters. Determination of ring size of monosaccharides. Cyclic structure of D(+) glucose. Mechanism of mutarotation. Structures of ribose and deoxyribose. An introduction to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination.

X Heterocyclic Compounds

Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine derivaties. Comparison of basicity of pyridine, piperidine and pyrrole.

Introduction to condensed five and six-membered heterocycles. Preparation and reactions of indole, quinoline and isoquinoline with special reference to Fisher indole synthesis, Skraup synthesis and Bischler-Napieralski synthesis. Mechanism of electrophilic substitution reactions of indole, quinoline and isoquinoline.

XI Fats, Oils and Detergents

Natural fats, edible and industrial oils of vegetable origin, common fatty acids, glycerides, hydrogenation of unsaturated oils. Saponification value, Iodine value, acid value. Soaps, synthetic detergents, alkyl and aryl sulphonates.

Physics

1. MATHEMATCAL METHODS IN PHYSICS-1

Vector Calculus: Scalar and vector fields, Differentiation of vectors, Grad, div, Curl and Laplacian operators. Vector relations in orthogonal curvilinear co-ordinates, Expressions for gradient, Divergence, curl and Laplacian operator in spherical polar and cylindrical co-ordinates, Gauss, Stokes'and Green's theorems.

Differential equations: Differential equations of first and second order and first degree (homogenous and inhomogeneous with constant coefficients) and their solutions. Gamma and Beta functions.

Fourier series: Fourier's theorem and its applications in the analysis of square and saw-tooth waves, Fourier integrals and transforms, applications to simple problems.

Theory of errors: Standard and probable errors, Propagation of errors, Principle of least squares, Least square fitting of date (linear case).

MATHEMATICAL METHODS IN PHYSICS-II

Series solution of 2^{nd} order differential equation. Lagendre, Bessel differential equations and solutions.

Laplace transform and its basic properties, transforms of elementary functions, Transform of derivatives and integrals, Inverse transform, Convolution theorem, Applications to simple problems described by first and second order differential equations.

2. SPECIAL THEORY OF RELATIVITY

Galilean transformation, Intertial frame of reference, Michelson-Morley experiment, Postulates of special theory of relativity, Lorentz transformation as orthogonal transformation, Four-victor, Lorentz Fitzgeraid contraction and time dilation, Minkowski's space. Relativistic Doppler effect, Addition of velocities. Velocity dependence of mass, Mass-energy equivalence. Lorentz covariance of maxwell's electromagnetic field equations.

3. GENERAL PHYSICS

Elasticity: Relations between different elastic constants, Torsional rigidity of cylinder and Torsional oscillations. Searl's method of determination of elastic constants of a material.

Flexure of beam: Cantilever and supported beam.

Surface tension: Ripple and gravity waves, Determination of surface tension by jaegar's and Quinke's methods, Surface tension and evaporation.

Viscosity: Poissuille's formula for flow of fluid through capillary tube, Determination of coefficient of viscosity-oscillating disc method, rotating cylinder method and Rankin's method.

Hydrodynamics: Equation of continuity, Euler's equation of motion, Bernaulli's theorem, from Euler's equation.

4. HEAT AND THERMODYNAMICS

Kinetic theory of gases: Maxwell's distribution law for velocity and energy of gaseous molecules, Experimental verification of the distribution law (Stern method), Law of

equipartition of kinetic energy, Mean free path and probability distribution of free path for gaseous molecules, Maxwell's expression for mean free path, Transport phenomeana-conduction, viscosity and diffusion.

Real gases: Derivation of van der wall's equation of state by virial theorem, Critical constants of a vander Wall's equation of state, Joule-Thomson porous plug experiment and its consequences. Temperature of inversion and its significance in the case of real gases.

Thermodynamics: Carnot's engine, reversible and irreversible processes, reversibility of Carnot's cycle, Carnot's theorem, Absolute scale of temperature.

Second law of thermodynamics: Different statements, Concept of entropy, Claussius inequality, Tds equation. Maxwell's thermodynamical relations and their applications. Claussius-Claperyron's relation.

Thermodynamical potential: Helmholtz free energy. Gibbs function. Enthalpy and chemical potentials.

Change of phase: Triple point, phase transition of second order. Thermodynamic equation of heterogeneous system and Gibb's phase rule. One and two component systems. Ehrenfest equation. Third law of theromo dynamics Nernst heat theorem and its experimental verification.

Radiation: Concept of black body, black body radiation, Stefan's law and determination of Stefan's constant, pressure due to radiation. Energy distribution in black body radiation, wien's displacement law, Rayleigh-Jean's law, Planck's law, Solar constant and its determination.

5. ACOUSTICS

Analysis of free and forced vibrations with and without damping, Amplitude and velocity resonance, Sharpness of resonance, Analysis of vibration of a plucked string using Fourier theorem. Speed of longitudinal waves in a fluid, energy density and energy transmission (Intensity) in waves, Sabine's formula and the determination of absorption coefficient. Vibration of rods and tuning fork.

6. ELECTROSTATICS

Electric moments: Potential due to a system of charges. Multipole expansion of an arbitrary distribution of charges (monopole, Dipole and quadrupole). Poisson's and Laplace's equation, Electrical polarization and displacement relation, energy density in an electric field due to an arbi-trary distribution of point charges, Arbitrary volume distribution of dipoles and corresponding volume and surface distribution of charge

Boundary conditions at the interface of two dielectric media and their application to a uniform electric field, Ionic, Electronic and orientational polarisability, Claussius-Mossotti relation, Langevin-Debye equation.

7. MAGNETISM

Boundary condition at the interface of two media and application to a sphere of magnetic material placed in a uniform magnetic induction, Demagnetizing factor. Magnetic Hysteresis, Hysteresis loss and measurement by magnetometer and ballistic galvanometer method, Origin of magnetic moment, Gyromagnetic ratio and gyromagnetic anomaly, Stern-gerlach experiment, Langevins theory of dia-and para-magnetism, Weiss theory of ferromagnetism.

8. WAVE OPTICS

Interference and Interferometers: Interference in thin films, Colour of thin films, Newton's ring, Michelson's interferometer-theory, visibility and sharpness of fringes, Applications of Michelson's interferometer, Fabry-Perot interferometer-theory and its applications.

Diffraction: Fresnel and Fraunhoffer diffraction, Half period Zones, Rectilinear propagation of light, Zone plate, Diffraction due to a straight edge, Fraunhoffer diffraction due to a single slit and N-slits, Plane transmission grating.

Resolving power: Rayleigh's criterion of limit of resolution, Resolving power of telescope, microscope, prism spectrometer and grating spectrometer.

Polarisation: Double refraction, Nicol prism, Retardation plates-quarter and half wave plates, Production and detection of plane, circularly and elliptically polarized light, Babinet's compensator-theory and its applications in the analysis of elliptically polarized light.

Optical activity: Theory of rotatory polarization, half shade and Biquartz polarimeters.

Velocity of light: Group and phase velocity, measurement of velocity of light by Anderson's method.

9. CURRENT ELECTERICITY

Review of Kirchhoff's laws, Mesh and loop analysis methods in solving electrical net-works. Concept of phasor and phasor diagram. General theory of moving coil aperiodic and ballistic galvanometers and their applications. General theory of a two-winding transformer and its phasor diagram, Auto transformer.

3-phase balanced system, Star and Delta connections, Inter-relationships and transformation. Rotating magnetic field and single-phase induction motor.

Order of a network, Driven and undriven second-order passive network (RLC) in time domain, Steady-state analysis of a Second – order possive network (RLC)

A.C. bridges-Schering bridge, Anderson bridge (with vector diagram) and Carey-Foster bridge. Concept of a transducer, temperature and displacement transducers, Strain gauge and its simple application.

Seebeck, Peltier and Thomson effects, Thermoelectric power, Thermoelectric diagram, Experimental determination of Peltier and Thomson co-efficients, Application of thermodynamics circuits. Heat pump.

10. ELECTROMAGNETIC THEORY AND PLASMA

Electromagnetic Theory: Maxwell's field equations in vacuum and in linear isotropic media, Boundary conditions on the fields at interfaces, Electromagnetic scalar and vector potentials, Gauge invariance, Energy conservation and Poynting's vector, Plane waves in vacuum and in continuous media, Reflection and refraction of electromagnetic waves at interface of two dielectric media, Fresnel's laws, Retarded potential, Lenard-Weichart potential, Radiation from an accelerated charged particle along and perpendicular to the direction of motion. Propagation of electromagnetic waves in a conducting medium. Optical properties of metals. Electromagnetic theory of dispersion.

Plasma: Basic condition for plasma existence, Concept of Debye length. Particle orbit and drift velocities in a plasma in homogeneous and inhomogeneous magnetic fields. Magnetic moments and its constancy.

Magnetic mirrors, Hydro magnetic equations, Magnetic pressure and tension. Pinch effect and Alfven wave, Characteistic plasma oscillations. Propagation of electromagnetic waves through isotropic plasma.

11. ATOMIC PHYSICS

Bohr's theory of hydrogen atom. Bohr-Sommerfeld theory, statement of selection rule for atomic transition and their application to sodium atom. Concept of electron spin, l-s and j-j couplings. Normal and anomalous Zeeman effect using vector model of atom.

12. LASER PHYSICS

Elementary idea of spontaneous and induced emission. Life time of excited states (meta-stable states). Laser problem, threshold condition for laser oscillation. Rate equations in two and three level systems. Actual laser systems: He-Ne laser, Ruby laser. Properties of laser radiation.

13. NUCLEAR PHYSICS

Instruments and measurement

Detectors: Ionization chamber. Proportional counter. G-M counter. Scintillation counter, Accelerators: Cyclotron, Synchro-Cyclotron, Betatron.

Mass spectrograph: Aston's mass spectrograph, Bainbridge and Jordon double focusing mass spectrograph.

Nuclear binding energy and stability of nuclei, Law of of radioactive decay, Statistical errors in nuclear physics, Radioactive growth and decay, Theory of ground state of deuteron.

14. CLASSICAL MECHANICS

Generalized co-ordinates and momenta, Hamilton's principle of least action. Lagrange's and Hamilton's equation of motion (derivation and application to simple physics problem). Cyclic co-ordinates, Conservation laws. Canonical transformations. Poisson's brackets. Hamiltin-Jacobi equations and application to harmonic oscillator problem. Motion in central field, Kepler's laws, two-particle motion in a central field. Collisions, Centre of mass and laboratory frames, Rutherford scattering, Differential scattering cross section. Rotating frame of reference: Inertial, Centrifugal and Coriolic forces. Moments of inertia: Product and principal moment of inertia. Euler's equation of motion for a rotating body, Euler's angles. Motion of a symmetric top in gravitational field.

15. QUANTUM PHYSICS

Inadequacy of classical mechanics. Origin of old quantum theory. Discreteness of energy-franck and Hertz experiment. Wave particle duality of matter and radiation (Photcelectric effect, Compton effect, Davisson and Germer experiment, Thomson's experiment). Heisenberg uncertainty principle. Wave function and its physical meaning. Wave packets. Schrodinger time-dependent and time-independent equations. Concept of stationary states. Probability density and probability current density.

Linear operator.

Physical quantities as Hermitian operator. Eigenvalues and eigen function of Hermitian operator: Simultaneous measurement and commutability of operators. Derivation of uncertainty relation using Schwartz inequality and simple applications of uncertainty relation. Expectation value and its time variation, Ehrenfest theorem. One-dimensional problems: Rectangular potential barrier, Square well potential of infinite and finite height, Tunneling effect. Particle in a rectangular box. Simple harmonic oscillator, Rigid rotator. Angular momentum-orbital angular momentum operator and its Cartesian components, commutation relations of components of angular momentum-azimuthal with L^2 , Eigenvlaues of L.

16. STATISTICAL PHYSICS

Need for statistical physics. Phase space Liouville's theorem and its consequences. Gibbs ensemble, Microcanonical distribution, Entropy and statistical weight, Gibbs paradox, Canonical ensemble: distribution function, Partition function and thermodynamical functions. Grand ensemble distribution function, Grand partition function and thermocynamical functions.

Monatomic ideal gas:

Boltzmann distribution law, Equation of state, Free energy, Specific heat

Quantum monatomic gas: Fermi-Dirac distribution, degenerate electron gas, Specific heat of degenerate electron gas. Bose-Einstein distribution law. Application to black body radiation, Planck's law, Stefan's law.

17. SOLID-STATE PHYSICS

Periodic structure: Lattice translational vector. Primitive lattice cell. Wigner Seitz cell. Bravais lattice in two and three dimensions. Miller indices. Simple crystal structure (sodium chloride and Cesium chloride). Periodic function and reciprocal lattice. Properties of reciprocal lattice. Diffraction condition and Bragg's law, Brillouin zone. Crystal binding: van der Waals, Ionic, Covalent, Metallic and Hydrogen bonded crystals. Cohesive energy of inert gas and crystals. Madelung energy and Madelung constant.

Specific heat of solids: Dulong-Petit's saw, Einstein and Debye theories of specific heat of solids at low temperature.

Lattice waves: Vibration of monatomic and diatomic linear chain Acoustical and optical branches.

Free electron theory: Free electron and Fermi gas in three dimension, fermi energy. Fermi surface. Weidmann-Franz law. Hall effect. Failure of free electron model.

Elementary band theory: Periodic potential and Bloch theorem, kroning-penny model, Band gap. Effective mass,. Band structure of metals, insulators and semiconductors. Super-conductivity: Occurrence, Critical temperature and critical magnetic field, Meissner effect, Superconductivity-Type I, Type II.

18. ANALOGUE ELECTRONICS

Nortan's theorems:

Semiconductor physics: Semiconductor, Conduction in semiconcuctors, Energy bands and conduction, conductivity, mobility and resistivity, Doping, diffusion, pn junction, biasing, depletion layer capacitance. Diode equation, Zener diode.

Diode and waveshaping circuits: Diode as a circuit element, Diode parameters, Temperature effects, Diode model, Diode as a switch, Diode switching parameters, Diode data sheet, Diode rectifier circuits (half and full wave), Ripple factor, Smoothing RC filters, Limitation of diode as a rectifier, Clipping and clamping circuits, Zener diode regulator and Zener Diode regulated power supply, introduction of 3-terminal IC voltage regulator chips.

BJT-Based circuits: Bipolar junction transistor structure, modes of operation, dc characteristics and dc parameters, load line and Q-point, Biaisng circuits (voltage divider and emitter bias) and Q-point stabilization, Small-signal equivalent models (low and high frequencies). BJT data sheet.

JFET-based circuits: Junction field-effect transistor structure, modes of operation, dc characteristics and dc parameters, Load line and Q-point, Biasing circuits (voltage divider and self bias) and Q-point stabilization, Small-signal equivalent models (low and high frequencies. JFET data sheet.

Amplifiers: Features of amplifier configurations, Analysis and design of RC coupled voltage amplifiers using BJT (CE mode) and JFET (CS mode), Frequency response, Concept of Bode plots, Classes of amplifiers, Push-pull class-B amplifier.

Feedback: feedback concept and feedback equation, Positive and negative feedback, Characteristics of negative feedback, Criteria of oscillations, RC phase shift and Wein Bridge oscillatiors, RF oscillators (Colpitt and Hartley), Astable multivibrator using BJT, Saw-tooth waveform generator.

Modulation and detection: Concept of modulation and its various types, Features of amplitude modulation, Simple AM modulator, Diode demodulator circuit.

Operational amplifier circuits: BJT –and FET-based difference amplifiers and the performance analysis (including CMRR), Ideal opamp characteristics and parameters, Op-amp symbol and its ideal equivalent model, Basic Op-amp circuits such as: inverting, noninverting, voltage amplifier, adder, difference, differentiating and integrating circuits.

Oscilloscope: Construction and principle of CRT operation, Basic layout of an oscillo-scope, Synchronization, Principle of dual trace oscilloscope, Common applications of oscilloscope.

19. DIGITAL ELECTRONICS

Digital fundamentals: Decimal, binary, octal, hexadecimal, BCD number systems and their inter-conversion, Decimal number addition and subtraction using 9's and 10's compliment, Binary addition and subtraction using 1's and 2's complement, Multiplication and division, Conversion of fractional and mixed decimal numbers into binary and vice-versa, Basic logic gates, Boolean algebra, Simplification of Boolean expressions using Boolean algebra and Karnaugh map, Logic gates data sheet interpretation, Conversion of a given truth table into its Boolean expression and logic realization and vice-versa. Half and Full adder, R-S, J-K and Master-Slave Flip-Flops.

HOME SCIENCE

Introduction to Human Development

I : Orientation to Growth and Development

a. Understanding growth and development (definitions)
b. General principles of development
c. Constraints and facilitators in growth and development (influences of heredity and environment)

- genetic inheritance: (i) fertilization (ii) Number of chromosomes (iii) the unique third pair determines sex. (iv) genotype and phenotype (v) sex lined genetic effects

-environmental pre requisites: (i) genes provide the predisposition range and direction of development (ii) environment determines the extent or limit.

II : The beginning of new life

- prenatal development and the birth process can be covered by a film or emphasize major development during the three stages of inter-uterine development and the stages of the birth process.

-prenatal influences on the child : biological risks, age of mother, physical characteristics, illness, diet and nutrition, stress and emotional strains, environmental hazards.

III : Development of Physical and Motor Abilities Across the Life Span

a. An introduction to the dimensions of development over the life span

- Physical and motor
- Cognitive
- Language
- Socio-emotional
- Personality

(emphasize inter relatedness and coordination between the dimensions of development)

b. What is physical and motor development,

Physical Development

- The new born physical appearance : size, weight, bodily proportions. Sensory capacities i.e., hearing, vision, taste, smell, touch, temperature and position.
- Changes in size, shape, muscles and bones and brains as it continues through: infancy, end of infancy, preschool, school going, adolescent growth spurt (include primary and secondary sexual characteristics and psychological impact of adolescence),

  Motor development: reflex in infancy, major milestones through end of infancy, preschool years, middle and late childhood, adolescent growth spurt (include primary and secondary sexual characteristics and psychological impact of adolescence),
- Motor development: reflexes in infancy, major milestones through end of infancy, preschool years, middle and late childhood, adolescence.
- Physical and motor development can be influenced through : (i) Maturation (ii) nutrition (iii) monitoring and health care (iv) stimulation (v) practice.

IV : Cognitive Development Across the Life Span

What is cognitive development

- The concept of intelligence.
- A brief introduction to Piaget's theory (introduce stages without much elaboration, sensorimotor stage in infancy concrete operational stage in childhood (changes in remembering the reasoning in middle childhood, formal operations in adolescence) fluid and crystallized intelligence in adulthood, declining cognitive abilities in late adulthood and old age.

V : The Development of Language Across the Life Span

Language as a form of Communication.

- Functions of language : expressing wishes, controlling others, interacting with others, expressing individually, exploring the world, pretending, using language to communicate/share information, understanding our society and culture, reasoning.

- Communicating before language development i.e. the stages of vocalization, undifferentiated crying babbling imitation of sound patterned speech.

VI : Socio-Emotional Development Across the life Span

a. Understanding social and emotional development.
b. Social development.
   - introduce socializations as an important part of the process of becoming human.
   - Social milestone: beginning with the emergence of social smile, attachment, separation, anxiety, acquiring sex roles in childhood, induction into occupational roles by adulthood, social isolation and consequences in late adulthood and in the elderly.
   - Patterns and role of parent-child interactions, interactions with siblings and peers,
   Social and cultural interactions, with through infancy to old age.
c. Emotional development.
   -basic emotional reactions (joy, fear, jealous, anger, sadness, aggression up to 14 years.

VII : Personality Development Across the Life Span

a. What is personality.
b. How personality development across the life span: temperament, sense of self in infancy and childhood, identity development in adolescence.
   (parention styles).
c. Personality May be influenced by heredity, parenting styles, peer groups, social interactions, early childhood experience, life events, support available in a community).
d. The role of social norms in personality development, deviant personalities (juvenile delinquency in childhood and anti-social personalities in adulthood)

VIII : The context of Social change and human development.
(Summary of current statues and future directions)

a. The changing face of the Indian family: moving from joint to nuclear, single parenting as a consequence of temporary occupation related separation, legal separation, divorce, working women.

Fundamental of Food and Nutrition

I : Concept of Nutrition

II : Functions of Food

III : Nutrients : Macro and Micro-nutrients

- Classification, sources, functions
- Recommended dietary Allowances
- Deficiency and excess (in brief) – water, carbohydrates, fats, energy, fiber, calcium, iron, magnesiu, water soluble vitamins, vitamin C, folic acid, zinc, fluorine, iodine, selenium, copper, manganese, fat soluble vitamins (A,D,E,K), (Thiamine, Riboflavin, Niacin), pyridoxine, panthothenic acid, BI2.

IV : Basic Terminology Used in Food Preparation

V : Food Production (in brief), Food composition, Structure, nutritional contribution and selection for the following :-

- Cereals and millets, pulses, fruits, vegetables, milk and milk products, nuts and oilseeds, meat, fish and poultry, eggs, sugars, tea, coffee, chocolate and other beverages and spices, processed foods.

VI : Methods of Cooking, there Advantages and Disadvantages and Effect on Nutritive Value.

VII : Improving Nutritional Quality for Foods.

Introduction to Resource Management

I : Introduction of Resource Management

Basic Concepts of managements.

II : Purpose of Management

a. Management and change.
b. Achievement of goals.

III : Family Characteristics Influencing Management

a. Life Style.
b. Type of family.
c. Family size, stage of family life cycle.

IV : Factors Motivating Management

a. Goals, definition, type and utility
b. Values- importance, sources of values, classification, characteristics, changing values.
c. Standards-definition, classification-quantitative, conventional and non-conventional.
d. Decision-role of decision making in management, resource availability.

V : Management Process

a. Meaning and elements of process-planning, controlling the plan and evaluation, decision-making.
b. Planning-importance, techniques, type of plans.
    i. Controlling the plan of action.
    ii. Phases energizing checking.
        - Factors in success of the control step.
        - suitability.
        - promptness.
        - new decisions.
        - flexibility.

iii. Supervision of delegated plan.
-type of supervision-direction and guidance
-analysis of supervision.

iv. Evaluation-importance, Relationships to goals, types-informal, formal, overall, and detailed techniques of self evaluation
-Evaluation of the whole process of management.

VI : Recourses in the Family

a. Types of resources.
b. Factors affecting the use of resources
c. Classification of the family on the basis to resource/income, vocation, activity profession, quality of human resources in the family, general, characteristics of work.

VII: Management of Specific Resources
Space, equipment, energy, community resources

Nutritional Management in Health and Disease

I : Definition of Health and Nutrition-
Dimensions of health (physical, psychological, emotional, spiritual)

II : Energy Requirements
-factors affecting energy requirements, BMR, activity, age, climate, diet-induced thermo genesis (SDA), physiological conditions.

III : Concept of Nutritionally Adequate Diet and Meal Planning

a. Importance of meal planning.
b. Factors affecting meal planning.

- nutritional, socio-cultural, religious, geographic, economic, availability of time and material resources.
- religious, geographic, economic, availability of time and material.

IV : Nutrition through the Life Cycle (at different activity and socio economic levels) requirements, nutritional problems, food selection.

a. Adulthood
b. Pregnancy
c. Location
d. Infancy
e. Preschool
f. Adolescence
g. Old Age

V : Principles of Diet Therapy

Modification of normal diet for therapeutic purposes, full died soft diet, fluid diet, bland diet.

VI : Nutritional Management in Common Ailments

Requirements and diet planning

a. Diarrhea
b. Constipation
c. Fevers-weight management.

Textiles and Clothing

I : Classification of Textiles

A. Introduction to textiles, classification of textiles fibers, terminology in textiles.
B. History, types, compositions, production, properties and uses-Cotton, Linen, Wool silk, Rayon, Polyamide, Polyester and Acrylic fibers.

II : Study of Yarn

Method of spinning, making of sewing thread, simple, novelty, metallic and textured yarn, stretch, corespun, bi and multi component yarn-characteristics.

Yarn numbering system (Cotton count, Denier, text-conversion from one system to another)

III : Study of fabrics

Different methods of fabric construction, weaving and knitting process, type of looms and its parts, step of weaving, basics weaves and its variation, fancy weaves.

IV : Dyeing and Printing

Scientific concept of dyes, Classification of dyes and their applicability to different fibers, method of dyeing, direct, resist and discharge.

Block, spray, and hand screen, Machine printing- flat bed, rotary screen, spray, flock, heat transfer, photo, lacquer.

V : Finishes

Purpose, type and method of giving finishes.

a. Physical- Singeing, napping, Brushing, Sizing, shrinking, Tenering, calendaring.
b. Chemical-Bleaching, mercerization etc.
c. Special purpose finishes-Wrinkle resistant, water resistant and repellent, flame retardant, durable press, soil release and resistant, ant pilling.

VI : Laundry

Various equipment and reagent used in laundry, principles of washing, method of laundering different fabrics, care of clothing.

VII : Traditional Textiles

Tradition textiles and embroideries of India

Clothing

I : Essentials of Clothing

Importance of clothing, social and psychological aspects of clothing, factors to be considered while selecting fabric and clothing.

II : Equipment and supplies

Equipment and supplies used in clothing construction, problem faced, remedies with specific reference to sewing machines.

III :

Elements and principles of design as applied to apparel designing, principle of clothing constructions, taking body measurement for different types of garments, handing and preparation of the fabric for garment making, drafting and making patterns, Lay out, marking and cutting of the paper pattern.

Family Dynamics and Environment

I : International Relationship Within the Family

a. Individual roles, rights and responsibilities with the family.
b. Family interaction and communication-importance, type and method of improvement.
c. Areas of adjustment with the family at different stages of life cycle.

II : Families and Problems

a. Families with marital disharmony and disruption, dimension, casual factors.
b. Families in distress, violence and abuse, dowry victimization, violence against women.

III : Interventions for Families in Trouble

a. Scope, needs and assessment.
b. Counseling: pre-marital and marital.
c. Welfare and rehabilitation policies and programmers.
d. Public awareness and education programmers.

IV : Environment

Introduction: meaning and definition of ecology and environment, scope of the subject, dimensions of environment-land, water, forest, population.

I :
Land-as a resource, energy and mineral resource, land pollution-sources, smelting and mining, industrial waste, agriculture, domestic waste, major health hazards and their control.

II :
Utility of water, problem and issue-water pollution and safety, pollution-health hazard and their control.

III :
Forests-utility of forest and forest resources, deforestation and its impact, forests conservation.

IV :
Air-composition and its usefulness to plants and animal kingdom, air pollutants – sources, their health hazards.

V :
Habitat and population-uncontrolled population growth and its impact, unplanned growth of cities and towns, migration, problems of housing and essential services, control measures.

VI :
Environmental education-meaning need and objectives, highlights role of government, NGOs and educational institution, national and international agencies.

Extension Education and Community Development

I :
Extension education scope, objective, need and importance, philosophy and principles of extension education, classification of extension teaching methods, factors affecting choice and use of methods, audio-visual aids.

II :
Development goals, the purpose of development – the input process and social action process, definition, types.

III : Community Development in India.

IV :
Historical Perspective of Development Approaches-the capitalistic approach, the welfare approach, the Gandhian approach, the modernization approach, the institutional and social justice approach, the socialist approaches –the concretization approach-development as liberation, the historical approach of radical social scientists-the Marxist approach rethinking a new paradigm of development, sustainable human development, universal growth, human rights.

V :
Critical Development Issues: massive poverty, population growth, food security

VI :
Community Development in India: evolution of community development programme in India since independence, structure and functions of community development at different levels.

VII :
Support Structures and their Functions: Central Social Welfare Board, State Social Welfare Board, National Level voluntary agencies such as CAPART, KVK, elected pantheist.

VIII : Community Development Programme Approaches.

- Multi-purpose
- Target group
- Growth centered
- Area
- Minimum needs.
- Antyodaya
- Integrated
- Critical reflection on these community development efforts

IX :

Women and Development welfare approach – women's role as wives and mothers emphasized anti-poverty approach, women's income generation programs-integrating women in development efficiency approach, emphasis on women's key role in production equity approach-combating patriarchy and exploitatio, subordination and oppression of women empowerment approach-process of women discovering the power within themselves to tackle the problems in their life situations critical review of these approaches in practice.

Unit X : Home Science and Community Development: scope of home science extension for meaningful participation in community development in India.

Mathematics

1. (Real Numbers, Sequence, Series)

- **a.** Axioms for the real number system, bounds, closed, open and compact sets Bolzano Weirstrass theorem, Heine Borel theorem.
- **b.** Limit of a sequence, monotonic sequences and their convergencem lim sup & lim inf. Subsequence, algebraic operations and limit. Cauchy sequence. General principle of convergence.
- c. Notion of convergent and divergent series of real terms, Pringshms theorem, comparision test, cauchy's root test. D' Alembert's ratio test. Alternating series and Leibnitz test. De-morgan and Bertrand test. Cauchy Condensation test, Gauss ratio test. Integral test, Absolutaly convergent series.

2. (Differential Calculus)

- **a.** Successive differentiation, Leibnitz theorem.
- **b.** Expansion, Partial Diffrentiation, Tylor's theorem for functions of two variables Jacobian
- **c.** Tangent and normal, Curvature.
- **d.** Asymptotes, Maxima and Minima of functions of two variables. Lagrang's multipliers.

3. (Trigonometry and Algebra)

- **a.** Trigonometrical and Exponential functions of complex argument and Hyperbolic functions, Expansions.
- **b.** Summation of Trigonomtrical series.
- **c.** Factorisation

4. (Analytical Geometry of two dimensions)

- a. Change of rectangular axis. Conditions for the general equation of second degree to represent parabola, Ellipse and Hyperbola and reducation into statndard forms.
- b. Equations of tangents and normal (using calculus). Chard of contact, polar and Pair of tangents.
- c. Axes, Centre director circle in reference to general equation of conic.
- d. Polar equation.

5. (Analytical Geometry of three dimension)

- **a.** Rectangular, Spherical, polar, Cylindrical co-ordinates, Direction cosines Angle between straight lines.
- **b.** Equations of planes and straight lines.
- **c.** Shortest distance between lines, spheres.

6. (Integral Calculus)

- **a.** Integration of rational and irrational functions, Evaluation of definite integrals, Reduction formula, Differentiation and integration under the sign of integration.
- **b.** Evaluation of double and triple integrals.
- **c.** Point of inflexion. Double Point, curve tracing Length and area
- **d.** Volumes and surface area of solids of revolution

7. (Vector)

- **a.** Product of three and four vectors. Work done, Moment of a vector about a point and about a line.
- **b.** Point function, Differentiation of a vector function of a scalar variables, Gradients, Divergence and curl and second order operators in certesian co-ordinate system.

8. (Theory of Equations)

- **a.** Relations of root and their symmetric functions with co-efficients:
- **b.** Transformation of equations, Descartes' rule of signs.
- **c.** Cardon's solutions of a cubic equation.
- **d.** Descarte's solution of a biquadratic equation.
- **e.** Disscriminant and nature of roots.

9. (Set Theory)

a. Indexed family of sets, Generalised set operations & Demorgan Laws, Set Mappings.
b. Bijection: Countable and uncountable sets, Schroeder – Bernstein Theorem, Cantor's Theorem, $2^{N_0} = N_1$
c. Equivalence relation and related fundamental theorem on partition.
d. Partial order relation & related concepts of u.b.,l.b.,inf.,sup., maximal element, minimal element & lattice (definition and examples only), Statement of Zorn's lemma.

10. (Matrices)

a. Preliminaries: Transpose, Conjugate, Special types (singular, non-singular, symmetric, skew symmetric, Hermitian, Skew Hermitian, Orthogonal, Unitary.) Algebra: Scalar Multiplication, Addition, Multiplication and Laws of operation, Adjoint, inverse, partitioning, Characteristic equation and Caley- Hamilton Theorem.
b. Rank: Elementary transformation, Normal form, elementary matrices, rank of product, equivalence of matrices and criteria for equivalence.
c. n-vectors: their linear dependence & related properties, subspaces of a space of n-vectors, span, basis and dim.., row rank and column rank of a matrix.
d. System of linear equations: Solution spaces of AX=0, Consistency conditions and the nature of general solutions of AX=B, Rank of sum and product.

11. (Analysis I)

a. Limit and Continuity: Limit, continuity, discontinuities, uniform continuity, Properties of functions continuous in closed intervals, Functions of bounded variation.
b. Derivability: Derivability, Relationship with continuity, Rolle's theorem. Lagrange's and Cauchy Mean Value theorem, Taylor's theorem.

   Maclaurin's theorem, Remainder after n terms. Powers series expansion of $(1+X)^n$ sin x, cos x, e^x and log (1+x) using suitable remainder after n terms.
c. Riemann Integration: Definition, Darboux's theorem I & II; integrability conditions, Particular classes of bounded integrable functions, Primitive, Fundamental theorem, first and Second Mean Value theorem

12. (Complex Analysis)

a. Real Functions of two variables, Simultaneous and iterated limits; Continuity, partial derivatives, differentiability and related necessary and sufficient condition.
b. Functions of a complex variables: Limit, continuity, derivative, Cauchy- Riemann Equations, Analytic Functions, Harmonic function. Construction of analytic function: Milne Thompson Method.
c. Geometric importance of some standard transformations e.g. w= z+c, w=cz, w+1/z. w= (az+b)/(cz+d) (bilinear).
d. Conformal transformation as transformation effected by analytic function. Special Conformal transformations $w=z^2$, w=sin z. $w=e^z$

13. (higher Arithmetic)

a. Divisibility, H.C.F., Primes & Unique Factorisation. The Diophantine equation ax+by= c, $x^2+y^2=z^2$.
b. Residue class, complete and reduced residue systems, congruences and their properties, Fermat's theorem and Wilson's theorem.
c. Arithmetical functions μ (n) & ϕ (n), Mobious inversion formula.
d. Algebraic congruences, Solution by inspection, Solution of ax=b (modn). Chinese Remainder theorem.

14. (Group Theory)

a. Groups, Preliminary results, Equivalent definitions, Sub groups, Cyclic subgroups, Lagrange's Theorem.
b. Normal subgroups, Quotient Groups and Homomorphism.
c. Permutations, Symmetric and Alternating Groups.
d. Simplicity of A_n, (n≠4) Automorphism of groups and structure of cyclic Groups.
e. Conjugate elements, Class equation.

15. (Differential Equation)

a. First order higher degree, Clairaut's form, Singular Solution, Orthogoal Trajectories.
b. Linear Equation with constant co-efficients, Homogeneous linear equations with variable co-efficients.
c. Second order linear equations: Solution by changing independent variable and by variation of parameters.
d. Simultaneous equation dx/P=dy/Q=dz/R and total d.e. Pdx +Qdy+ Rdz=0 together with their geometrical significance.

16. (Mechanics)

a. Reduction of system of coplanar forces, equation of resultant, condition for equilibrium, Astatic center.
b. Laws, Angles and Cone of friction, equilibrium on a rough inclined plane, Particle constrained to move on a rough curve under any given force.
c. Kinematics in two dimension: tangential, normal; radial, transverse velocities and acceleration, Angular velocity and acceleration. Rectilinear motion and simple pendulum: S.H.M., Compounding of two S.H.M., Repulsive motion, Motion under inverse square law.
d. Rectilinear Motion (Kinetics): Newton's law, Work, K.E., Work-energy, principle, Impulse, Torque and angular momentum, conservation of energy, momentum and angular momentum, Hooke's law, extension of an elastic string: Horizontal & vertical case.

17. (Analysis II)

a. Convergence of improper integrals, Comparison Test, Absolute Convergence, Abel's and Dirichlet's Test, Frullani's Integrals, Def.& convergence of Beta & Gamma Functions, their Properties, duplication formula, inter-relation.
b. Multiple integrals via Dirichlet's Theorem, Liouville's extension, change of order of integration and change of variables.
c. Vector Integration: Line Integral, Surface Integral, Green's theorem in R^2 stroke's theorem, Gauss Divergence theorem.

18. (Abstract Algebra II)

a. Rings, Preliminary Results, Special kinds, Subrings and Ideals.
b. Quotient rings, Fields and Homomorphism.
c. Fundamental theorem of homomorphism, First and second theorems of isomorphism.
d. Field of quotients and embedding theorem, Polynomial rings, Euclidean ring & Unique Factorisation in it.

19. (Differential Equations II)

a. Partial Differential Equation: Formation, Linear p.d.e. of order
1- Laggrange's Method.
b. Non-linear Equation of order 1, Four forms & charpit's Method.
c. Homogeneous linear equations with constant co- efficient, rules for C.F. and P.I.
d. Non- linear equations of 2^{nd} order: Monge's Method.
e. Laplace Transform: Definition, Transform of elementary functions, properties, Inverse Transform, Transform of derivatives and integrals, Multiplication by t^n, division by t..Convolution theorem and application to differential equations.

20. (Statics)

a. Conditions for equilibrium of forces in three dimensions.
b. Wrench Pitch, Null lines.
c. Principle of virtual work and its application in two dimensions cases.
d. Common catenary.
e. Stable equilibrium, Energy test of stability (problems involving one variable only).

21. (Dynamics)

a. Motion of a particle under a central force, Differential equations of a central orbit in both polar & pedal co-ordinates.
b. Newton's law of gravitation, Planetary orbits, Kepler's laws of motion.

d. Motion of the mass centre and motion relative to the mass center, D' Alembert's principle.
e. Two- dimensional motion of a rigid body rotating about a fixed axis. Compound pendulum.

22. (Fluid Mechanics)

a. Nature and properties of fluid pressure, Pressure of heavy liquids.
b. Equilibrium of fluids under given system of forces.
c. Center of Pressure.
d. Thrust on plane and curved Surfaces.
e. Lagrangian and Eulerian Methods, Equation of Continuity.
f. Euler's Equation of motion for perfect fluid, Bernauli's theorem.

23. (Linear Algebra)

a. Vector space : Definition and properties subspaces, linear dependence, dimension and basis of finite dimensional vector space, Quotient space, Direct sums and complements, Matrices and change of basis.
b. Inner product & Norm in a l. s., properties of inner product Schwartz inequality, Orthonormal set, Orthonormal basis and Gram- Schmidt construction for finite dimensional inner product space.
c. Linear transformation : Definition, Sylvester Law of nullity, Algebra of linear transformations, Dual spaces, Principle of duality.
d. Matrices and linear transformation, diagonalisation of a matrix, Row rank and column rank, matrix of linear transformation and related theorem.

24. (Metric Space)

a. Definition and examples of metric spaces. Open sets, Interior. Closed sets closure.
b. Convergence, Completeness, Bair's theorem, Cantor's Intersection theorem.
c. Continuous maps. Uniform Continuity and related extensions.

25. (Special Functions)

a. Series Solution: Ordinary point; singular point (regular), General methods and forms of series solution (Indicial equation – Frobenius Method).
b. Bessel's equation: Solution, Recurence formula for Jn (x), Generating function for Jn (x). Orthogonality of Bessel's function.
c. Legendre equation:solution,Rodrigue's Formula, Legendre polynomials, Generating function for Pn(x). Orthogonality of Legendre's polynomials.
d. Hypergeometric functions, Special cases, Integral representation. Summation theorem.

26. (Probability Theory & Statistics)

a. Notion of probability, Random experiment, Sample space, Axioms of probability, Elementary properties of probability, Equally likely outcome problems. Random variable, Concept, Cumulative distributions function, Discrete and continuous random variables, expectations, means, variance, moment generating function.
b. Discrete distribution: Binomial, Geometric, Poisson.

   Continuous distribution: Uniform, Exponential, Normal.
c. Conditional probability and conditional expectation, Baye's Th., Independence, Computing expectation by conditioning: a list model, a random graph.
d. Co-efficient of Correlation, Rank correlation, Spearman's formula.
e. Curve fitting and method of least square.
f. Lines of regression, Regression co-efficients and their properties.

27. (Numerical Analysis)

a. Solution of cubic and biquadratic equations, Bisection, Regula Falsi and Newton-Raphson Method.
b. Operator D.E, Factorial Notation: Ordinary and divided differences, Newton's divided difference formula, Lagrange's interpolation.
c. Numerical differentiation, derivatives when ordinates are equally spaced, Remainder term.

d. Numerical integration, quadrature formulae, Simpson's rule. Integration using Newton's interpolation formula.

28. (Linear Programming)

a. Convex sets in R2 and their properties. L.P.P. Problem formulatin, Graphical Method.
b. Simplex method including M-method, Duality; Dual Simplex method.
c. Transportation and Assignment.
d. Deterministic replacement models; Sequencing problems on two machines and jobs:

29. (Discrete Mathematics)

a. Introduction to Graph Theory: Graph and degree sum theorem, Connected graph, Bi-partile graph, Trees, Eulerian and Hamiltonian graph, Plane graph and Euler's theorem, Planer graph, 5-colour theorem, Marriage theorem.
b. Logic: Logical connectives, Negetion, Quantifiers, Compound statements, Truth table, Tautologies.
c. Boolean Algebras: Lattices geometrical lattices and Algebraic structures, Duality, Distributive and complemented lattices, Boolean Lattices and Boolean Algebras, Boolean functions and expressions, Design and Implementation of Digital Networks, Switching Circuits.

30. (Mathematical Modelling)

a. Difference and differential equation growth models: Single species population models, Population growth an age structure model. The spread of technological innovation.
b. Higher order linear models: A Model for the detection of diabetes.,
c. Nonlinear population growth models: Prey-predator models. Epidemic growth models.
d. An Application in environment: Urban waste wate management planning models.
e. Models from political science: Proportional representation (cumulative and comparison voting)) models.

31. (Elements of Computer Programming)

a. Binary system, Octal and Hexadecimal systems. Conversion to and from Decimal system. Codes, Bits, Bytes and words. Memory of computer, arithmetic and Logical operations on number. Precision. AND, OR, OXR, NOT and shit/Rotate operators, Algorithms and Flow charts.
b. Programming in C : Programmer's model of a computer. Algorithms, Flows Charts. Data Types. Arithmetic and input/output instructions. Decisions control structures. Decision statements. Logical and Conditional operators. Loop. Case control structures. Functions. Recursions. Preprocessors. Arrays, pupetting of strings. Structures. Pointers., File formatting.

ECONOMICS

1. Micro-Economics

Introduction

Nature and scope of economics; Methodology in economics; Choice as an economic problem; Basic postulates; Role of Price mechanism; Demand and supply; Market equilibrium

Consumer's Behaviour

Utility- Cardinal and ordinal approaches; Indifference curve- Consumer's equilibrium (Hicks and Slutsky); Giffen goods; Elasticity of demand – Price, income and cross; Consumer's surplus.

Theory of Production and Costs

Production function; Isoquants; Factor substitutions; law of variable proportions, returns to scale, economies of scale; Different concepts of cost and their interrelations; Equilibrium of the firm; Expansion path.

Market structure

Market forms – perfect and imperfect markets; Equilibrium of a firm – perfect competition, monopoly and Price discrimination; Measure of monopoly power; Monopolistic competition; Duopoly; Oligopoly.

Factor Pricing

Marginal productivity theory of distribution: Theories of wage determination; Wages and collective bargaining; Wage differentials; Rent – scarcity rent, differential rent, quasirent; Interest – Classical and Keynesian theories; Profits – Innovation, Risk and Uncertainty theories.

Investment Analysis

Payback period; Average annual rate of return: Net present value; Internal rate of return criteria; Cost–Benefit analysis.

Welfare Economics

Problems in measuring welfare; Classical welfare economics; Pareto's criteria; Value judgment; Concept of a social welfare function; Compensation principle – Kaldor, Hicks.

2. Development Economics

Development and Economic Growth

Economic growth and development; Factors affecting economic growth; Growth models: Harrod-Domar, Solow, Meade and Mrs. Joan Robinson's growth model.

Economic Development, Population and Institutions

Development and underdevelopment; Poverty – absolute and relative; Measuring development and development gap – per capita income, inequality of income and wealth-Ginni Coefficient; Human Development Index, Physical Quality of Life Index and other indices of development; Concept and Role of intellectual capital, Food security, education, health and nutrition in Human Resource Development; Population problems and growth pattern of population; Theory of demographic transition; Population, Poverty and environment; Economic development and institutions; Markets and market failure; state and state failure; Issues of good governance.

International Aspects of Economic Development

International trade as an engine of growth; Static and dynamic gains from trade; Prebisch, Singer and Myrdal theses vs. free trade; Export – led growth; Balance of Payments; Tariffs and effective protection; Post-GATT international economic order; WTO and developing countries.

Macro Economic Policy and Economic Development

Role of monetary and fiscal policies in developing countries; External resources; FDI; Aid vs. trade; Technology inflow; MNC activity in developing countries; IMF and World Bank polices in developing countries.

3. Indian Economy

Structure of Indian Economy

Basic features; natural resources –land, water and forest resources; infrastructure development; National Income.

Population

Broad demographic features – population size and growth rates, sex composition, rural-urban migration, occupational distribution; problem of overpopulation; Population policies.

Planning in India

Objectives; Strategy; Broad achievements and failures; New economic Reforms – Liberalization, Privatization and Globalization; Rationale behind economic reforms; Progress of privatization and globalization.

Agriculture

Nature and importance; trends in agricultural production and productivity; factors determining productivity; land reforms; New Agricultural Strategy and Green Revolution; Rural credit, Agricultural marketing.

Industry

Industrial Development during the Planning period; Industrial Policy of 1948, 1956, 1977 and 1991; Industrial Licensing Policy, MRTP Act, FERA and FEMA; Growth and Problems of small- scale industries; Role of Public sector enterprises in India's industrialization.

External Sector

Role of Foreign Trade; Trends in Exports and Imports; Composition and direction of India's Foreign Trade; Balance of Payment Crisis and the New Economic Reforms – Export promotion measures and the New Trade Policies; Foreign Capital – FDI, AID; Multinational Corporation (MNCs)

Important Areas of Concern

Food Security; Poverty and inequality; Unemployment; Rising Prices; Industrial relations.

Basic Features of the Jharkhand Economy

Demography; Agriculture; Industries; State Economic Policy.

4. International Economics

Importance of Trade and Trade Theories

Importance of the study of international economics; Inter-regional and international trade; Theories of Absolute cost advantage, Comparative cost advantage and Opportunity cost; Hecscher-Ohlin Theory of trade- its main features, Assumptions and Limitations.

Gains from Trade

Gains from Trade – their measurement and distribution; Trade as an engine of economic growth; Concepts of terms of trade and their importance in the theory of trade; Doctrine of reciprocal demand – its importance and limitations in the theory of trade.

Tariffs and Quotas

Types of tariffs and quotas; their impact in partial equilibrium analysis; Free trade and policy of tariffs in relation to economic growth with special reference to India; Concept of optimum tariff.

Balance of Trade and Balance of Payment

Concepts and components of Balance of Trade and Balance of Payment; Equilibrium and disequilibrium in Balance of Payment; Consequences of disequilibrium in Balance of Payment; Various measures to correct deficit in the Balance of Payment; Relative merits, demerits and limitation of devaluation; Concept and implications of Foreign Trade Multiplier; Functions of IMF, World Bank and GATT/WTO; Reforms of the International Monetary System in India.

5. Public Finance

Nature and Scope of Public Finance

Meaning and Scope of public finance; Distinction between private and public finance; Public goods vs. private goods; The principle of Maximum Social Advantage; Market failure; Role of the government.

Public Expenditure

Meaning, classification and principle of public expenditure; Canons and effects of public expenditure; Trends in public expenditure and causes of growth of public expenditure in India.

Taxation

Sources of public revenue; Taxation – Meaning, canons and classification of taxes; Division of tax burden – the Benefit and Ability-to-Pay approaches; Impact and incidence of taxes; Taxable capacity; Effects of taxation; Characteristics of a good tax system; Major trends in tax revenue of the central and state governments in India.

Public Debt and Financial Administration

Sources of public borrowing; Effects of public debt; Methods of debt redemption: The Public Budget and its kinds; Economic and functional classification of the budget.

6. Quantitative Techniques

Basic Concepts

Variables, Sets, Functions, Equations, Identities, System of Equations, Application of Straight line system, slope of the line, Homogeneous function.

Calculus

Differentiation of function; maxima and minima; Elasticity; Equilibrium of a firm and consumer; Interrelationships among total, Marginal and average cost and revenues; Constrained optimization problem; Integration of a function, Consumer's and producer's surplus.

Matrix and Determinants

Various types of matrices, determinants, inverse of a matrix, Cramer's rule, Input-Output analysis: Simple Static Model; Concept of Linear Programming, Graphic method of solution.

Introduction to Statistics

Basic concepts: Population, sample, Parameter, Frequency distribution, Cumulative frequency; Graphic and diagrammatic representation of data, Techniques of data collection; Sampling vs. census method; Primary and secondary data.

Central Tendency and Dispersion

Measures of Central Tendency- Mean, Median, Mode, Geometric mean and Harmonic mean; Measures of dispersion-Range, Mean deviation, Standard deviation, Coefficient of variation, Quartile deviation, Skewness and Kurtosis.

Correlation and Regression

Correlation; Coefficient of Correlation – Karl Pearson and Rank Correlation, Partial and Multiple Correlation Analysis; Regression Analysis – Estimation of Regression line in a Bivariate Distribution, Least Square Method, Interpretation of Regression Coefficients.

Time Series and Index Numbers

Time Series Analysis – concepts and components; Determination of Regular, Trend and Seasonal indices; Index Numbers – concepts, Price relative, Quantity Relative, Value relative; Laspeyer's, Paasche's and Fisher's indices; Family Budget Method; Problems in the construction and limitations of Index Numbers, Test for ideal Index Number.

Probability and Distribution

Probability: Concept and Rules of probability (addition and multiplication); random variables, mathematical expectations, Theoretical distributions-Binomial, Poisson, and Normal: their properties and uses.

7. History of Economic Thought

Early Period

Mercantilism: main characteristics; Thomas Munn-Physiocracy: natural order, primacy of agriculture, social classes, Tableau Economique, taxation, Turgot – Economic ideas of Petty, Locke and Hume.

Classical Period

Adam Smith – division of labor, theory of value, capital accumulation, distribution, views on trade, economic progress; David Ricardo – value, theory of rent, distribution, Ideas on economic development and international trade; Thomas R. Malthus – theory of population, Theory of glut; German romantics and socialists – Sismondi, Karl Marx – Dynamics of social change, Theory of value, Surplus value, profit and crisis of capitalism; Economic ideas of J.B. Say, J.S. Mill; Historical School-Senior, List.

Marginalists

The precursors of marginalism – Cournot, Thunen, Gossen; the Marginalist revolution, Jevons, Walras and Menger; Bohm-Bawark, Wicksell and Fisher: the rate of interest – Wicksteed and Weiser; Distribution – Marshall as a great synthesizer; role of time in price determination, economic methods, ideas on consumer's surplus, elasticities, prime and supplementary costs, representative firm, external and internal economics, quasi-rent, organization as a factors of production, nature of profits; Pigou: Welfare Economics; Schumpeter: role of entrepreneur and innovations.

Keynesian Ideas

The aggregate economy, Liquidity Preference Theory and Liquidity Trap, Marginal Efficiency of Capital and Marginal Efficiency of Investment. Wage rigidities, under-employment equilibrium, role of fiscal policy: deficit spending and public works, multiplier principle, cyclical behavior of an economy, uncertainty and role of expectations.

Indian Economic Thought

Modern Economic ideas: Naoroji, Ranade: Economic ideas of Gandhi; Village, Swadeshi, Place of machine and labor, Cottage industries, Trusteeship.

8. Optional Paper (Any one of three groups)

Group 1 -Mathematical Economics and Econometrics

A. Mathematical Economics

Quantitative Methods

Variable, Constants and Parameters; Simple functional relationship and their graphs; Elementary ideas of differential and Integral Calculus; Matrix and determinants; solution of simultaneous equation; quadratic equation; difference and differential equation.

Consumer Theory

Utility function; budget line; constrained optimization; consumers equilibrium; Income effect, substitution effect; Slutsky equation; derivation of Demand curve; elasticity of demand; consumers surplus.

Theory of Production

Properties of production function – homogenous and non-homogenous; Cobb-Douglas, CES, Returns to Scale; Technology progress and production function; choice of optimal combination of factors of production; cost and revenue functions; derivation of cost curves; relation between total, average and marginal cost and revenue; producers surplus; production possibility curve; adding-up theorem.

Market Structure/Pricing

Concept of equilibrium; equilibrium of the firm under perfect competition; Monopoly; Price discrimination; Monopolistic Competition; subsidies and taxes; economies of scale; market equilibrium.

Input-Output Analysis, Linear Programming

Input-Output analysis; the simple closed and open model; linkages, concepts and measurements; dynamic Input- Output model; Linear Programming – basic concepts, primal and dual, basic theorems of Linear Programming; graphical method.

Game Theory

Introduction and concepts – simple and mixed strategy; saddle point solution; prisoner's dilemma; payoff matrix of a game – two-person- zero-sum game.

B. Econometrics

Introduction

Definition and scope of econometrics; The methodology of econometric research; specification and estimation of an econometric model; consistency and sufficiency.

Simple Regression Analysis and Theoretical Distribution

Stochastic vs. Deterministic relationship; Correlation and Regression; Coefficient of determination; Estimation of an equation; Theoretical frequency distribution and application of Binomial, Poisson and Normal; testing of Hypothesis, Type I and Type II errors, Standard Error, Tests based on Z,t,X2 (Chi Square) Statistics.

Estimation Theory

Ordinary Least Square (OLS) Method- assumption; Gauss-Markov Theorem; Testing of regression coefficients; Test for regression as a whole, F test.

Problems in OLS Estimation

Problems of heteroscedasticity, Auto-Correlation (first order), Multicollinearity-their consequences, tests and remedies.

Application of Econometric Methods

Production and cost functions and consumption functions.

Group 2- Demography and Agricultural Economics

A. Demography

Introduction

Population study and demography; its relation with other disciplines; Theories of population – Malthus, Optimum Theory of population and Theory of demographic transition; historical evidence of population growth in developed and developing countries.

Sources Of Demographic Data In India

Sources of Demographic data in India; Census-Civil Registration System and Demographic Surveys, National Family Health Survey I, II and III-their relative merits and demerits.

Techniques of Analysis

Crude birth and death rates; Age specific birth and death rates; Standardized Birth and death rates; Study of fertility; Total Fertility Rate, Gross Reproduction Rate and Net Reproduction Rate; Study of marital status; Life table- meaning of its columns and its uses; Reproductive and child health in India; Temporal and Spatial variation in sex ratios.

Population Projection

Techniques of population projection; Concept of stationary, stable and quasi-stationary population; ageing of population in India, changes in family structure and old age security.

Population Policy

Salient features of population census of 1991,2001 and 2011; evolution of population policy in India; shift in policy-focus from population control to family welfare and to women empowerment; Population- health, poverty and environment linkage in India; The New Population Policy.

B. Agricultural Economics

Rural Economy of India

Structure of the Indian economy: place of agriculture in rural economy; composition of the Indian rural economy: Farm sector and non-farm sector,; diversification of agriculture: agriculture and allied activities (Fisheries, horticulture, floriculture); Forestry in India: its growth, problems and state

policies; cattle wealth of India and dairying; rural industrialization: food processing and agro based industries; development of rural infrastructure.

Development of Agriculture

Role and Importance of Agriculture in Economic Development: Linkages between the Agricultural Sector and the Non Agricultural Sector, Changing nature of linkages; Agricultural resources in India: Land utilization, Cropping pattern; Irrigation in India; Trends in Agricultural Growth and Agricultural Productivity.

Agrarian Relations and Land Reforms in India

Agrarian relations: historical evolution and land reforms program during 1950's and 1960's; Land Reforms: Programs and performance during the 1970's and after.

Technological Change in Agriculture

Technology in Agriculture; Traditional techniques and practices; HYV seeds-fertilizer, Water technology (Green Revolution); Sustainable agriculture; Emerging trends in agricultural technology; Dry land farming; Use of bio-technology techniques.

State and Agriculture-I

Agricultural finance in India: Importance, Types of requirements; Sources: Non-institutional and institutional; Existing rural credit delivery system (multi agency approach); Agricultural marketing in India; Markets and marketing functions, Regulated Market, Role of cooperatives in agriculture.

State and Agriculture-II

Agricultural planning in India: Decentralized Planning and Indicative Planning; Incentives in Agriculture: Price and non-price incentives; Input subsidies; Agricultural Price Policies (APP), Nature of demand and supply of agricultural products, Need for state intervention; Food security in India and Public Distribution System.

Fifty Years of Indian Agriculture

An overview of agriculture development; Under-employment and Unemployment in the rural economy; Globalization of Indian Economy and its effects on Indian Agriculture.

Group 3- Industrial Economics and Banking & Financial Institutions

A. Industrial Economics

Introduction

Industry and Economic Development; Industry and Sectoral linkages; Industrial classification.

Industrial Organization And Ownership Structure

Public, Private, Joint and Cooperative sectors; Private corporate sector; MNCs and their role; Industrial competition and monopoly; Corporate Governance.

Pricing of Industrial Products

Industrial pricing and market structure; Pricing in India

Location and Dispersion

Locations of industries; Theories of location; Diversification; Integration and merger of industrial units; Dispersion and problems of Regional Imbalance.

Composition of Industrial Sector

Significance of size; Major large scale industries – Sugar, Cement, Cotton, Iron and Steel, Jute, Agro Processing Industries; Small-scale industries; Cottage and Village industries and Rural industrialization; Emerging global competition and Indian industry.

Industrial Productivity

Concept and measurement of productivity – Productivity in Indian industries; Industrial sickness; Under-utilization of capacity – Factors accounting for it and consequences.

Financing of Industry

Mode of financing – Equity and Debt; Institutional Finance; Bank Finance.

Indian Industry in the International Context

Globalization and Indian Industry; International competitiveness of Indian Industry; Privatization and issues relating to Disinvestment Policy.

Industrial Development in India

Industrial Structure at the time of Independence; Industrial Policy (Role of State); New Industrial Policy and Economic Reforms; Industrial Growth and Pattern.

Industrial Labor

Structure of Industrial Labor; Employment dimensions of Indian industries; Industrial Legislation; Industrial Relations; Exit Policy and Social Security; Wages and problems of bonus.

B. Banking and Financial Institutions

Money and Commercial Banking

Meaning, functions and kinds of money; Components of supply of money; Money Market and Capital Market; regulated and unregulated credit market; Features of a developed money and capital market; Importance of financial system in India; Functions, types and objectives of Commercial Banks; The liabilities and assets of Banks; Role of Commercial Banks before and after nationalization in economic development in India; Mechanism of credit creation by the commercial banks; purpose and limitations; Pre-requisites of a sound commercial banking system; A brief review of the measures taken to liberalize the financial system- Direction of future reforms.

Financial Institutions in India

Functions and Growth of financial institution in India; Functions and objective of Central Bank; Instruments of credit control – Quantitative and Qualitative methods – Bank Rate Policy, Open Market Operations, Variable Reserve Ratio and Selective Methods; Role and functions of the Reserve Bank of India; Development and regulatory of RBI; Objective and limitations of Monetary Policies; Inflation – types, causes, effects of inflation on different sectors of the economy; Demand-pull and cost-push inflation; Measures used by RBI to control inflation; Recent Monetary Policy of RBI; Banking and Financial System Reforms and their impact on economic growth in India; Structure of Cooperative Institutions and Development Banks in India – their objectives, role and limitations; definition and types of NBFIs, viz. Mutual Funds, LIC, Investment Companies, Venture Capital, growth and importance; Recent

measures taken by the RBI and SEBI to regulate their working in the sound monetary management of India.

Financial Markets

The structure of financial markets: Call-money, Treasury Bills and Commercial Bills; the stock-market and market for Gilt-edged securities; Unregulated credit markets; Financial Sector Reforms in India; SEBI and working of Capital Markets in India.

Foreign Exchange Market

Foreign exchange; Foreign Exchange Rate; Foreign Exchange Market – concepts of Spot Exchange Rates and Forward Exchange Rates; determination of exchange rates under Fixed and Flexible Exchange Rate Regimes and role of hedging in the determination of Exchange Rates; Euro Dollar Market – its role and significance.

POLITICAL SCIENCE

BASIC PRINCIPLES OF POLITICAL THEORY

1. Nature and Significance of Political Theory
2. Power and Authority
3. State : Origin and Development
4. State : Nature and functions – Liberal & Marxist
5. Sovereignty : Monism and Pluralism
6. Citizenship ,Right and liberty
7. Equality and Justice
8. Democracy : Elitist and Pluralist view
9. Welfare State : Growth and Functions
10. Development : Social, Economic and Political

INDIAN POLITICAL THOUGHT

1. Sources of Indian Political Thought.
2. Political thought in Ancient India.
3. Kautilya.
4. Dayanand Saraswati and Swami Vivekanand.
5. Tilak and Gokhale.
6. Aurobindo Ghosh.
7. M. N. Roy.
8. Mahatma Gandhi.
9. B. R. Ambedkar.
10. J. L. Nehru, R. M. Lohia, Acharya Narendra Dev and J. P. Narayan.

INDIAN GOVERNMENT AND POLITICS

1. The making of India's constitution and its sources.
2. Basic features of India's constitution.
3. Preamble, Fundamental Rights and Duties and the Directive Principles of State Policy.
4. Union Government : President,Parliament,Cabinet and Prime Minister.
5. The State Government : Governor, Council of Ministers and the Chief Minister.
6. Center- State Relations.
7. Supreme Court .
8. Political Parties: National and Regional Parties.

9. The Election Commission.
10. Major issues in Indian Politics.
    a) Caste
    b) Religion
    c) Language
    d) Regionalism

COMPARATIVE GOVERNMENT AND POLITICS

(Government and Politics of U.K., U.S.A. France & Switzerland)

1. Comparative Politics : Meaning and Scope.
2. Approaches to the Study of Comparative Politics.
3. Constitutions and constitutionalism.
4. Constitutional Structures: Executive, Legislature and Judiciary.
5. Political Culture and Political socialization.
6. Political Parties and party Systems.
7. Interest groups and Pressure groups.
8. Local Governments.
9. Procedure of Constitutional Amendment.
10. Socio – Economic bases of the constitution.

PUBLIC ADMINISTRATION

1. Meaning, Nature and Scope of Public Administration.
2. Evolution of public Administration as a Discipline.
3. New public Administration.
4. Politics and Administration.
5. Methods of study of Public Administration.
6. Development Administration.
7. Bureaucracy.
8. Budgeting.
9. Legislative control over Administration.
10. Judicial Control over Administration.

INTERNATIONAL POLITICS

1. International Politics: Concept, scope and distinction between International Relations and International Politics.
2. International Politics: Growth & Development , Utility of its study.
3. Theories of International politics: Idealist & Realist.

4. National Power: Meaning and Elements.
5. Balance of power.
6. National Interest.
7. Collective Security.
8. Impact of unipolar world on world order.
9. Issues of International politics: Terrorism and Cross Border Terrorism.

WESTERN POLITICAL THOUGHT

1. Plato – Justice, Education, Communism & Philosopher King.
2. Aristotle – Nature and purpose of the State, Revolution, Citizenship & Slavery.
3. Machiavelli – Human Nature, Religion & Morality.
4. Hobbes – Social Contract, Sovereignty & Individualism.
5. Locke-Social Contract ,Theory of consent & Natural Rights.
6. Rousseau – Social Contract & General Will.
7. Bentham – Utilitarianism.
8. J.S. Mill – Liberty, Representative Government & Departure from Bentham's Utilitarianism.
9. (a) Hegel – Dialectics & State
   (b) T.H. Green - Idealism & Right of Resistance.
10. Karl Max – Theory of class Struggle & State.

MAJOR ISSUES IN CONTEMPORARY POLITICS

1. Post Cold War world : Issues and Concerns.
2. Brandt Report and its Effect.
3. Globalization and Liberalization.
4. Environmental Concerns.
5. Human Rights.
6. Women's Empowerment.
7. The Challenge of Terrorism.
8. Process and Problems of Democratic Expansion.

POLITICAL IDEOLOGIES

1. Political Ideologies : Meaning and content.
2. Liberalism.
3. Communism.
4. Democratic Socialism.

5. Fascism and National Socialism.
6. Anrachism.
7. Confucianism.
8. Gandhism.

GEOGRAPHY

Introduction to Geography

1. Introduction: The Nature of Geography ; objective and relevance.
2. Place of Geography in the classification of sciences.
3. Geography : Major Themes & sub-Themes : Geography as
   The study of environment: man-environment relationship; Ecology and ecosystem.
4. Environmental determinism; possiblism, neo-determinism
5. Dualism in Geography: Systematic/ Regional; Physical/Human.
6. Recent trends in Geography with special reference to India.
7. Imperatives for the future career opportunities for Geographers
8. Introduction to modern techniques, use of Air Photos and Satellite Imageries; Remote sensing as a tool for data generation and mapping; Computer- Cartography.

(Applied Geography)

1. Nature, Scope and content of Applied Geography.
2. Issues related to variations in Physical Environment Variation in land quality affecting agricultural productivity.
3. Environmental degradation, Environmental disaster and Environmental Management.
4. Issues related to human resources: Carrying capacity of the earth
5. Spatial Inequality: Cause and Consequences.
6. Environment and Sustainable Development with a focus on Man-Environment relationship.

PHYSICAL GEOGRAPHY
(ELEMENTS OF GEOMORPHOLOGY)

1. Geological Time Scale and Earth's Interior.
2. Wegener's theory of Continental Drift and Plate Tectonics.
3. Earth's Movements: Organic and Epeirogenic.
4. Isostasy: Earthquakes and Volcanoes.
5. Geomorphic Agents and Processes: Evolution of landscape: Concept of cycle of erosion, interruptions of cycle of erosion.
6. Fluvial, Arid and Glacial cycle of erosion.

7. Karst and coastal landscape.
8. Application of geomorphology to human activities; Settlement; transport, land use mining.

(CLIMATOLOGY & OCEANOGRAPHY)

1. Weather and Climate: Elements of weather and climate.
2. Composition and structure of Atmosphere.
3. Air Masses and Fronts.
4. Atmospheric Disturbances: Tropical and Temperate Cyclones.
5. Climate Classification: Basis of koppen's classification & Types
6. Role of Climate on Human Life, Atmospheric Pollution And Global Warming.
7. Surface Configuration of Ocean Floor: Continental Shelf and Continental Slope.
8. Relief of the Atlantic, Pacific and the Indian Ocean
9. Distribution of Temperature and Salinity of Oceans.
10. Marine deposits and Coral Reefs.

Geography of India

1. India in the context of South east and South Asia; India a land of diversities; unity within diversities.
2. Major terrain elements of India their role in shaping physical landscape of India.
3. Drainage systems of India and their functional significance.
4. Regional and seasonal variations of climate – Climatic regions of India.
5. The Monsoon, Western and Northwestern disturbances.
6. Soil types of India – their distribution and characteristics.
7. Vegetation types and their distribution, Forest resources.
8. Minerals and power resources- The status of their use and need for conservation.
9. Spatial distribution of population and density, Socio- economic implication of population explosion; urbanization.
10. Regionalization of Indian agriculture and typology.
11. Industrial reasons of India and their Industrial structure.
12. Basic regional divisions of India- macro, meso and micro- regions of India

REGIONAL GEOGRAPHY OF JHARKHAND

1. Physical setting.
2. Resources; Forest and Minerals.
3. Agriculture resources and Problems.
4. Industrial Landscape and Prospects of Industrial Developments.
5. Habitat and Economy of Santhal, Munda, Oraon.
6. Tourism and its prospects.

WORLD REGIONAL GEOGRAPHY

1. Asia: Physical, Economic and Demographic characteristics, Physical- Structure, relief, climate, Vegetation. Economic- Agriculture, minerals, power resources, industry. Demographic- Distribution, Density, Growth.
2. Regional study of East Asia.
3. Europe: Physical, Economic and Demographic
4. Regional studies of British Isles.
5. North America: Physical Economic and Demographic
6. Regional study of New England.
7. South America : Physical, Economic and Demographic
8. Regional Study of Chile.
9. Australia and New Zealand: Physical, Economic and Demographic
10. Regional study of New Zealand.
11. Contemporary issues in World Geography. Ecography, W.T.O and UNEP (U.N. Environmental Programme).

HUMAN GEOGRAPHY

1. Nature and scope of human geography. Branches of human geography.
2. Primitive life-style of mankind and subsequent migration.
3. Division of Mankind : Spatial distribution, Physical and social profile of racial groups.
4. Ethnic groups: tribals group in the world and in India;
5. Early economic activities of mankind: food gathering, hunting, Fishing and veg- culture, shifting cultivation.
6. Human adaptation to the environment:
   (i) cold region- Eskimo;
   (ii) hot region- Bushman/.
7. Plateau – (I) Gonds (ii) Mountain – Gujjars,

8. Distribution of population; world distribution pattern – physical, Economy and social factors influencing spatial distribution.
9. Concept of over population, under population and optimum population, Zero Population Growth.
10. Migration – Internal (India) and International.
11. Population regions of India.
12. Problem of over population of India and remedial measures.

RESOURCE AND ENVIRONMENT

1. Meaning, nature and components of resources, and environment. Resources and environment interface.
2. Classification of Resources: renewable and non- renewable: Biotic (forests, wild – life, live stock, fisheries, agricultural crops) and Abiotic (land, water, mineral).
3. Distribution and utilization of water, minerals (Iron ore, Manganese, Copper and Mica), and energy resources, their economic and environmental Significance.
4. Types and distribution of forests, flora, fauna and fisheries- their economic and environmental significance and conservation.
5. Major soil types and their distribution; problems of soil erosion and soil Conservation.
6. Number, density, growth and distribution of population, population pressure and resource utilization.
7. Classification of Environment: Natural and Human. Man environment interrelations and environmental hazards.
8. Emerging environmental issues: population explosion; deforestation and Global warming.
9. Conservation of bio – diversity.
10. Sustainable development.

BIOGEOGRAPHY

1. Definition, scope and significance of Biogeography;
   Basic ecological principles: Bio energy cycle in the terrestrial ecosystem; Energy budget of the Earth.
2. Trophic levels and food chain; concepts of Biome. Ecotone and Community.
3. Origin of fauna and flora; major gene-centers; Domestification of plants and animals and their dispersal agents and roots.

4. Distribution of plant life on the earth and its relation to soil, Climate and human activities.
5. Geographical distribution of animal life on the earth and its relation to vegetation types, climate and human activities.
6. Communities: nature of communities and ecosystems; bio diversities and human induced community change, habitat decay and conservation.
7. Industrial effluent and its effect on fresh water and marine biology; Management practices (special reference to India).
8. Study of any two of the following ecological regions of India in relation to their plant and animal life, their interrelations, problems, conservation and Management: (a) Mangrove (b)Tropical rainforest (c) Desert (d) Mountain (e) Fresh water and (f) Marine.

POPULATION GEOGRAPHY

1. Nature, scope and contents of Population Geography; Sources of data.
2. Spatial pattern of population– distribution, density and growth of Population.
3. Determinants of world regional patterns, the Indian scene.
4. Composition of population: Age and Sex composition; rural-urban Composition; economic composition in India.
5. Determinants; world regional patterns; composition of population in India.
6. Migration: classification, determinants and consequences of migration.
7. World regional patterns and migration in India.
8. Population and environment Interface: Cause–effect syndrome; global and Indian profile.

HISTORY

I. HISTORY OF INDIA FROM THE EARLIEST TIMES TO C.A.D. 650

1: Sources and Approaches to Ancient Indian History Source : literature; archaeology; epigraphy; numismatics.

2: Protohistory :The Harappan Civilization-origin, distribution, major sites (Mohenjodro, Harappa, Kalibangan, Lothal, Dholavira), agrarian base, craft production and trade, religious beliefs and practices.

3: Background to the emergence of early historic India:Society, economy, polity and religions as reflected in Vedic literature.

4: Janapadas and Mahajanapadas :Early monarchical states and gana-sanghas. Craft Production, trade and coinage.

6: The Mauryan Empire Nature and bases; Chandragupta Maurya, Career and Achievements, political and cultural Ashoka's Dhamma-its nature and propagation; society economy and art and architecture.

7: Post-Mauryan Developments (C.B.C. 200- A.D. 300)

a. Invasions and their Impact : Greeks and Kushanas.
b. Polity : Post Mauryan polities with special referen_ce to the Kushanas and Satavahanas; - Chola.
c. Economy : Land grants and agricultural expansion; urban growth; craft production; trade routes; coinage and currency; Indo-Roman trade.
d. Society : peasanatization of tribes; assimilation of incoming people.
e. Religion : spread of Jainism and Buddhism; emergence of the Mahayana Buddhism; Vaisnava and Saiva forms of worship; beginning of the Tantric practices.
f. Culture; art and architecture; sculpture; literature; scientific and technical treatises.
g. Sangam Age: Society, language and literature.

8 : Age of the Guptas

a. State and administrative institutions.
b. Social and economic changes with special reference to urban patterns : agrarian structure: land grants: coinage and currency system and trade.
c. Cultural developments; art; architecture; sculpture; paintings; literature; religion and the Sanskrit theatre.

9 : Post Gupta Period

a. Harshavardhana : Political system and administrative institutions.
b. Cultural developments with special reference to art and religion.

II History of Modern Europe [CAD 1789-1945]

a. French Revolution: crisis of the ancient-regime; intellectual currents; participation of social classes.

b. Emergence of Napoleon Bonaparte : expansion, consolidation and downfall; and the Congress of Vienna, 1815.
c. Social and Political developments, 1815-1848 : Metternich – social; political and intellectual currents; revolutionary movements of 1830 and 1848 A.D.

Unification of Italy and Germany.

a. Europe between 1871-1914: Bismarck in diplomacy and system of alliances; World War I.- causes and result
b. Europe 1914-1945: Russian Revolution, 1917; Peace settlements and post-1919 world under economic crises; the Great Depression and recovery; Fascism and Nazism; Causes of result of World War II.

HISTORY OF INDIA : [CAD 650 TO 1550]

1: CAD 650-1260

a. Arab invasions : Ghaznavid and Ghorid invasion: nature : and impact.
b. Pratiharas, pallav, Rashtrakutas, Cholas. Administration art and architecture of pallavs Rashtrakutas, Cholas.

Economy :

a. Land grants and Agrarian system changes in land tenure; peasants.
b. Urban centers; trade and trade networks; coinage and currencies ; crafts, guild and industries.

Culture :

a. Literature : rise and growth of regional languages.
b. Art, architecture, paintings, sculpture.
c. Science and technology.

2: Sultanate from A.D. 1200 to 1550

a. Sources of sultanate period
b. Political Structure : theories of kingship, central structure and military organization; iqta; territorial changes; Mongol threat.
c. Society – Nobility class and position of woman
d. Economy- Position of peasant & Trade and commerce

Religion and Culture :-

a. Sufism : doctrines; Silsilas and Practices.
b. Bhakti movements; Nathpanthisl Kabir, Nanak; and the Sant traditional.
c. Sultanate Architecture.

3: Regions

Societies and Political Formations : A regional perspective :-

a. Rajasthan
b. Vijaynagar

Societies and Economy: A Regional Perspective:-

a. Vijaynagar Economy- Trade and commerce
b. Bahamani Society, Culture and Economy.
c. Trade and urbanization with special reference to South India.

d. Religious cults: Vaishnavite movements in eastern India; Jagannath in Orissa and cult Ramanuj, Ramanand, Chaitanya.

e. Regional art and architectural forms.

III HISTORY OF CHINA AND JAPAN [CAD 1840-1949]

1: China

a. China as an informal colony:
   i. Opium wars; treaties with imperialist powers; and struggle for concisions in China.
   ii. Increasing western economic interests.
   iii. Open door policy.

b. Emergence of nationalism in China:
   i. Boxcer rebellion and its consequences.
   ii. Reforms of 1901-08.
   iii. Revolution of 1911 Role of social classes; sun Yat Sen principles and politics; emergence of the republic

c. Nationalism and communism in China.
   i. Nature of industrialization and changing social structure;
   ii. KMT and the first united front.
   iii. Chinese Revolution – ideology, causes and significance.

2: Japan

a. Meiji Restoration : And processes of modernization-Social, military, political and economic.

b. Emergence of Japan as an imperial power; Sino-Japanese relations: Anglo-Japanese alliance; Russo-Japanese war (1905) [redacted] Manchurian Crisis second, Sino-Japanese war.

c. Japan and World War its consequences.

IV HISTORY OF INDIA [UPTO CAD- 1550 – 1750]

1: The Mughals

a. Sources of mughal india

b. Source; Abul Fazl, Badauni, Bernier.

2: Polity

a. Evolution of the administrative system; Mansab; and Jagir.

b. The Mughal ruling classes; nobility; and zamindars.

c. State and religion : Akbar's religious ideas; Sulh-i-kul; relations with religious elites; Aurangzeb's relations with religious groups and institutions.

3: Rural Economy and Society

a. Agricultural production; management of water resources; agricultural technology and crop patterns and role of the state;

b. Agrarian structure; land ownership and rights; revenue system; the village community; and peasantry Trade routes and the pattern of internal commerce.

4: Urban Centers

a. Administration of cities and towns.
b. Urban economy; crafts; industries; organization of production; imperial karkhanas and textiles.
c. Urban Social Structure : Merchant communities; bankers; artisans; craftsmen and labors.

5: Cultural Developments

a. Language and Literature
b. Architecture and painting

6: Decline of the Mughal Empire and Emergence of Successor States

7: Religion and Culture

a. Sant Tradition; Vaishnava Bhakti and its regional variants, sants and their mults; shrines; and pilgrimages.
b. Formation of religious identities : Sikh; Kabirpanthis and Dadupanthis.
c. Regional languages and culture.

V. HISTORY OF INDIA FROM [CAD-1750-1950]

1: Colonial State and its Ideology

a. Orientalism.
b. Utilitarianism.
c. Colonial state's attitude to social institutions such as cast, tribe and communities.

2: Rural Economy and Society

a. The rural agrarian social structure.
b. Land Revenue Settlements.
c. Commercialization of agriculture.
d. Peasants and landless labor.
e. Changing rural landscape and environment; the issues concerning forestry; and an environmental view of rural change.
f. The tribal dimension : the changing economy and society of the tribal world.

3: Trade and Industry

a. Changes in the trading economy of India in the 18th Century : Surat, Bengal, Coromandal; trade; and trade routes;
b. Banking – indigenous; and modern.
c. Emergence of modern industries- Cotton; jute; and steel.

4: Cultural Changes and Social and Religious Reform Movements

a. Rise of modern education; and press.
b. Socio-religious revivalist/reform movements.
c. Women: Changing position and attitudes.

5: Nationalism

a. Political ideology and organizations; formation of the Indian National Congress.
b. Moderates and Extremists.
c. Swadeshi movement
d. Revolutionaries.
e. Emergence of Communal consciousness.
f. Gandhian ideology and movements; Rowlett Act Satyagraha; Khilafat, non-cooperation; civil disobedience; Quit India; role of social groups and classes.
h. Constitutional changes and response- Morley Minto Reforms; Govt. of India Act of 1919 Simon commission and Nehru Report; communal Award; govt. of India Act, 1935, Working of Provincial Ministries; Cripps Mission; Wavell Plan and Cabinet Mission, Partition of India.

VI. History of Jharkhand [From the Earliest Times to 1947].

a. The Mundas and the Oraons Settlement in Chotanagpur:
b. Tribal Village Administration.
c. The Nagabanshi Raj: Origin, Nature and Achievements.
d. Jharkhand Under Medieval Period.
   I. The Turko-Afgans.
   II. The Mughals.
e. British entry into Jharkhand and its early relations with the Rajas of Palamau, Ramgarh and Nagpore.
   I. The Tribal Revolt of Chotanagpur (1831-32)
   II. The Santhal Hul (1855-56)
   III. 1857 in Jharkhand.

f. Revivalis Movement in Jharkhand.
   I. Birsa Movement.
   II. Tana Bhagat Movement.
g. Administration under the British Raj.
   I. Revenue Administration.
   II. Judicial Administration.

मुंडारी

1- बूदू बाबू और उनकी रचनाएँ	–	सं. डॉ. राम दयाल मुण्डा (प्रीतपाला और रामायणपाला)
2- बम्बरू	–	रचनाकार–दुलाय चन्द्र मुण्डा
3- संसग बा	–	रचनाकार–काण्डे मुण्डा
4- हिसिर, मुण्डारी पाठ, आदिवासी साहित्य एवं संस्कृति	–	संपादक–डा. रामदयाल मुण्डा
5- मथुरा : कानि प्रथम भाग	–	लेखक–मेनस राम ओढ़ेया
6- बिरसा मुण्डा	–	लेखक– डॉ0 अनुज कुमार धान
7- कुदुम आर सोलको	–	लेखक–एम.एम. मुंडू
8- मुंडारी पाठ	–	लेखक डॉ. राम दयाल मुंडा
9- मुंडारी साहित्य का इतिहास, मुंडा लोक कथाएँ (भूमिका भाग), बांसुरी बज रही (भूमिका भाग)	–	जगदीश त्रिगुणयत
10. जोनोका कजिका	–	प्रो. मनसिद बड़ायउद

11. मुण्डारी पद साहित्य का विकास, मुण्डारी गद्य साहित्य का विकास, मुण्डारी निबंध साहित्य का विकास, मुण्डारी कहानी का विकास, मुण्डारी नाटक का विकास, मुण्डारी कविता का विकास, मुण्डारी आलोचना का विकास, मुण्डारी आधुनिक साहित्य का विकास।
12. मुण्डारी भाषा विज्ञान की परिभाषा, क्षेत्र–विस्तार, महत्व, शाखा–प्रशाखा, भाषा और बोली, भाषा का उत्पत्ति–सिद्धान्त, भाषा परिवर्तन के कारण, भाषा परिवार, ध्वनि–विज्ञान के सामान्य सिद्धांत। मुण्डारी भाषा विज्ञान–पुस्तक मुण्डारी भाषा का भासिक संरचना–डॉ0 बिरेन्द्र कुमार सोय। मुण्डारी व्याकरण–डॉ0 राम दयाल मुण्डा।
13. मुण्डारी साहित्य की परिभाषा, साहित्य के तत्व, गीत, कविता, कहानी, नाटक, उपन्यास का रचना विधान, शब्द शक्ति और अलंकार–अनुप्रास श्लेश, यमक, रूपक, विरोधाभास, उपमा और उत्प्रेक्षा।
14. मुण्डारी लोक साहित्य–

(क) मुण्डारी लोक गीत– सामान्य परिचय, भेद–उपभेद, सौन्दर्य चेतना, ऐतिहासिक तथ्य, सांस्कृतिक चेतना, प्रकृति चित्रण, जीवन दर्शन, रस, अलंकार, योजना, छन्द–विधान, भाषिक–रचना, शिल्प, बिम्ब–विधान आदि। संदर्भ पुस्तक– (क) मुण्डारी लोक गीत–आनायुम दुरंड। प्रकाशन– जनजातीय शोध संस्थान, रांची।

(ख) मुण्डारी लोक कथा– सामान्य परिचय, भेद–उपभेद, मिथ, लीजेण्ड, फेबल, अन्य कथाएँ, कथानाक, रूढियाँ, एतिहासिक तथ्य, सांस्कृतिक अवधारणा, भाषा–शैली, आदि। मुण्डारी लोक कथा, पुस्तक–आनायुम कानिको, प्रकाशन–जनजातीय शोध संस्थान, रांची।

(ग) मुण्डारी प्रकीर्ण साहित्य– लोकोक्ति, मुहावरा, पहेली, बालगीत, खेलगीत, मंत्र आदि। मुण्डारी प्रकीर्ण साहित्य–हाडाम होड़ो कोआः काजिको–फा0 पी0 पोनेद।

संताली –

1. भूरका इपिल – रचनाकार–शारदा प्रासाद किस्कू
2. लिटा गोडेत – रचनाकार–साधु राम चाँद मुर्मू
3. सोंवहेत सकवा – रचनाकार–एस. हेम्ब्रम
4. ओनोड़हें सेरेज बिंडा – रचनाकार–प्रो. के. सी. टुडू
5. तिरी – रचनाकार–हरिहर हांसदा
6. बिदु चाँदान (नाटक) – लेखक–पं. रघुनाथ मुर्मू
7. पे जोड़ काहनी – लेखक– सोमनाथ बेसरा
8. धोरोम आखड़ा – लेखक पाराव मुर्मू
9. मेटेरियल फोर द संताली ग्रामर – पी. ओ. बोडिंग
10. संताली लोककथा – प्रो. दिगम्बर हांसदा
11. संताली गीतों का संग्रह – हरिहर हांसदा, बीरबल हेम्ब्रम
12. भेनता कथा – नुनकू सोरेन

13. संथाली पद्य साहित्य का विकास, गद्य साहित्य का विकास, निबंध साहित्य का विकास, कहानी का विकास, नाटक का विकास, कविता का विकास, आलोचना का विकास, आधुनिक साहित्य का विकास।

14. संथाली भाषा विज्ञान की परिभाषा, क्षेत्र–विस्तार, महत्व, शाखा–प्रशाखा, भाषा और बोली, भाषा का उत्पत्ति–सिद्धान्त, भाषा परिवर्तन के कारण, भाषा परिवार, ध्वनि–विज्ञान के सामान्य सिद्धांत।

15. संथाली साहित्य की परिभाषा, साहित्य के तत्व, गीत, कविता, कहानी,नाटक, उपन्यास का रचना विधान, शब्द शक्ति और अलंकार–अनुपांस, श्लेश, यमक, रूपक, विरोधाभास, उपमा और उत्प्रेक्षा।

16. संथाली लोक साहित्य–

(क) संथाली लोक गीत– सामान्य परिचय, भेद–उपभेद, सौन्दर्य चेतना, ऐतिहासिक तथ्य, सांस्कृतिक चेतना, प्रकृति चित्रण, जीवन दर्शन, रस, अलंकार, योजना, छनद–विधान, भाषिक–रचना, शिल्प, बिम्ब–विधान आदि।

(ख) संथाली लोक कथा– सामान्य परिचय, भेद–उपभेद, मिथ, लीजेण्ड, फेबल, अन्य कथाएँ, कथानाक, रूढ़ियाँ, एतिहासिक तथ्य, सांस्कृतिक अवधारणा, भाषा–शैली, आदि।

(ग) संथाली प्रकीर्ण साहित्य– लोकोक्ति, मुहावरा, पहेली, बालगीत, खेलगीत, मंत्र आदि।

हो –

1. दुरं दुदगर, जेरा जिवोन दस्तुर, – धनश्याम गागराई
   हो लोक गीतों का संग्रह / हो लोककथा – रचनाकार–प्रो. बी. पी. पिंगुआ
2. हो दिसुम होनको भाग–7 – लेखक– धनुरसिंह पुरती
3. हो भाषा और उसका साहित्य – जसदेव दास अभिनव
4. हो पद साहित्य का विकास, गद्य साहित्य का विकास, निबंध साहित्य का विकास, कहानी का विकास, नाटक का विकास, कविता का विकास, आलोचना का विकास, आधुनिक साहित्य का विकास।
5. हो भाषा विज्ञान की परिभाषा, क्षेत्र–विस्तार, महत्व, शाखा–प्रशाखा, भाषा और बोली, भाषा का उत्पत्ति–सिद्धान्त, भाषा परिवर्तन के कारण, भाषा परिवार, ध्वनि–विज्ञान के सामान्य सिद्धांत।
6. हो साहित्य की परिभाषा, साहित्य के तत्व, गीत, कविता, कहानी,नाटक, उपन्यास का रचना विधान, शब्द शक्ति और अलंकार–अनुपांस, श्लेश, यमक, रूपक, विरोधाभास, उपमा और उत्प्रेक्षा।
7. हो लोक साहित्य–

   (क) हो लोक गीत– सामान्य परिचय, भेद–उपभेद, सौन्दर्य चेतना, ऐतिहासिक तथ्य, सांस्कृतिक चेतना, प्रकृति चित्रण, जीवन दर्शन, रस, अलंकार, योजना, छनद–विधान, भाषिक–रचना, शिल्प, बिम्ब–विधान आदि।

   (ख) हो लोक कथा– सामान्य परिचय, भेद–उपभेद, मिथ, लीजेण्ड, फेबल, अन्य कथाएँ, कथानाक, रूढ़ियाँ, एतिहासिक तथ्य, सांस्कृतिक अवधारणा, भाषा–शैली, आदि।

   (ग) हो प्रकीर्ण साहित्य– लोकोक्ति, मुहावरा, पहेली, बालगीत, खेलगीत, मंत्र आदि।

कुड़ुख –

1. चइज्जका कुँड़ुख कत्थडंडी – सम्पादक– डॉ0 हरि उराँव, महेश भगत
2. पुनाखोर, कुँड़ुख साहे डण्डी (पियुस लकड़ा द्वारा रचित कुँड़ुख कत्थपंडी में प्रकाशित) – रचनाकार – इन्द्रजीत उराँव
3. दव बिल्ली, चाला अखड़ा खूजका उण्डी भाग–2 – रचनाकार–बासंती कुमारी कुजूर
4. अयंग जिया (नाटक) – लेखक–पियुस लकड़ा
5. कुँड़ुख लोक साहित्य – सम्पादक – डॉ0 हरि उराँव, महेश भगत
6. कुँड़ुख भाषा– साहित्य का उद्‌भव और विकास – लेखक– महेश भगत
7. कुँड़ुख कत्थअइन – प्रो0 चौठी उराँव, महावीर उराँव
8. कुँड़ुख पद साहित्य का विकास, गद्य साहित्य का विकास, निबंध साहित्य का विकास, कहानी का विकास, नाटक का विकास, कविता का विकास, आलोचना का विकास, आधुनिक साहित्य का विकास।
9. कुँड़ुख भाषा विज्ञान की परिभाषा, क्षेत्र–विस्तार, महत्व, शाखा–प्रशाखा, भाषा और बोली, भाषा का उत्पत्ति–सिद्धान्त, भाषा परिवर्तन के कारण, भाषा परिवार, ध्वनि–विज्ञान के सामान्य सिद्धांत।

   संदर्भ पुस्तक–हिन्दी भाषा एवं कुँड़ख भाषा क्रियाओं का प्रकारात्मक अध्ययन–लेखक–डॉ0 हरि उराँव।
10. कुड़ुख साहित्य की परिभाषा, साहित्य के तत्व, गीत, कविता, कहानी,नाटक, उपन्यास का रचना विधान, शब्द शक्ति और अलंकार–अनुप्रास, श्लेश, यमक, रूपक, विरोधाभास, उपमा और उत्प्रेक्षा।
11. कुड़ुख लोक साहित्य–

    (क) कुड़ुख लोक गीत– सामान्य परिचय, भेद–उपभेद, सौन्दर्य चेतना, ऐतिहासिक तथ्य, सांस्कृतिक चेतना, प्रकृति चित्रण, जीवन दर्शन, रस, अलंकार, योजना, छनद–विधान, भाषिक–रचना, शिल्प, बिम्ब–विधान आदि।

    (ख) कुड़ुख लोक कथा– सामान्य परिचय, भेद–उपभेद, मिथ, लीजेण्ड, फेबल, अन्य कथाएँ, कथानाक, रूढ़ियाँ, एतिहासिक तथ्य, सांस्कृतिक अवधारणा, भाषा–शैली, आदि।

    (ग) कुड़ुख प्रकीर्ण साहित्य– लोकोक्ति, मुहावरा, पहेली, बालगीत, खेलगीत, मंत्र आदि।

    संदर्भ पुस्तक–कुँड़ुख बुझुरनखरना अरा बंको कत्या – इन्द्रजीत उराँव

    संदर्भ पुस्तक–कुँड़ुख लोक साहित्य का प्रकीर्ण भाग – प्रकाशक – टी0आर0आई0, राँची।

कुरमाली

1. बिनन्दिया के गीत – रचनाकार–एच. एन. सिंह
2. महिपालेक गीत – रचनाकार–श्री पदो महतो बंसरिआर
3. सपन–आपन – रचनाकार–अनंत कुमार महतो
4. फुरूंग – रचनाकार–केशव चन्द्र महतो
5. मधु वासात – लेखक–
6. झूमर एवं झूमर देश – गिरीश चन्द्र महतो
7. कुड़माली तंत – लखीकान्त महतो
8. झारखण्डेर लोक साहित्य – डॉ. बंकिम चन्द्र महतो
9. पद साहित्य का विकास, गद्य साहित्य का विकास, निबंध साहित्य का विकास, कहानी का विकास, नाटक का विकास, कविता का विकास, आलोचना का विकास, आधुनिक साहित्य का विकास।
10. भाषा विज्ञान की परिभाषा, क्षेत्र–विस्तार, महत्व, शाखा–प्रशाखा, भाषा और बोली, भाषा का उत्पत्ति–सिद्धान्त, भाषा परिवर्तन के कारण, भाषा परिवार, ध्वनि–विज्ञान के सामान्य सिद्धांत।
11. साहित्य की परिभाषा, साहित्य के तत्व, गीत, कविता, कहानी,नाटक, उपन्यास का रचना विधान, शब्द शक्ति और अलंकार–अनुप्रास, श्लेश, यमक, रूपक, विरोधाभास, उपमा और उत्प्रेक्षा।
12. लोक साहित्य–

    (क) लोक गीत– सामान्य परिचय, भेद–उपभेद, सौन्दर्य चेतना, ऐतिहासिक तथ्य, सांस्कृतिक चेतना, प्रकृति चित्रण, जीवन दर्शन, रस, अलंकार, योजना, छन्द–विधान, भाषिक–रचना, शिल्प, बिम्ब–विधान आदि।

    (ख) लोक कथा– सामान्य परिचय, भेद–उपभेद, मिथ, लीजेण्ड, फेबल, अन्य कथाएँ, कथानाक, रूढ़ियाँ, ऐतिहासिक तथ्य, सांस्कृतिक अवधारणा, भाषा–शैली, आदि।

    (ग) प्रकीर्ण साहित्य– लोकोक्ति, मुहावरा, पहेली, बालगीत, खेलगीत, मंत्र आदि।

खोरठा

1. समाजक सरजुक निसइन, एक झोटइर लेख,

   खोरठा साहित्येक इतिहास, खोरठा लोक कथा – रचनाकार–ए. के. झा

2. आँखीक गीत – रचनाकार–श्री निवास पानुरी

3. दामुदरेक कोराञ् – रचनाकार–शिवनाथ प्रमाणिक

4. छाँहइर (कहानी संग्रह) – लेखक–चितरंजन महतो "चित्रा"

5. डाह (नाटक) – लेखक–सुकुमार

6. खोरठा पद साहित्य का विकास, खोरठा गद्य साहित्य का विकास, खोरठा निबंध साहित्य का विकास, खोरठा कहानी का विकास, खोरठा नाटक का विकास, खोरठा कविता का विकास, खोरठा आलोचना का विकास, खोरठा आधुनिक साहित्य का विकास।

7. खोरठा भाषा विज्ञान की परिभाषा, क्षेत्र–विस्तार, महत्व, शाखा–प्रशाखा, भाषा और बोली, भाषा का उत्पत्ति–सिद्धान्त, भाषा परिवर्तन के कारण, भाषा परिवार, ध्वनि–विज्ञान के सामान्य सिद्धांत।

8. खोरठा साहित्य की परिभाषा, साहित्य के तत्व, गीत, कविता, कहानी, नाटक, उपन्यास का रचना विधान, शब्द शक्ति और अलंकार–अनुपास, श्लेश, यमक, रूपक, विरोधाभास, उपमा और उत्प्रेक्षा।

9. खोरठा लोक साहित्य–

   (क) खोरठा लोक गीत– सामान्य परिचय, भेद–उपभेद, सौन्दर्य चेतना, ऐतिहासिक तथ्य, सांस्कृतिक चेतना, प्रकृति चित्रण, जीवन दर्शन, रस, अलंकार, योजना, छंद–विधान, भाषिक–रचना, शिल्प, बिम्ब–विधान आदि।

   (ख) खोरठा लोक कथा– सामान्य परिचय, भेद–उपभेद, मिथ, लीजेण्ड, फेबल, अन्य कथाएँ, कथानाक, रूढ़ियाँ, एतिहासिक तथ्य, सांस्कृतिक अवधारणा, भाषा–शैली, आदि।

   (ग) खोरठा प्रकीर्ण साहित्य–लोकोक्ति, मुहावरा, पहेली, बालगीत, खेलगीत, मंत्र आदि। संदर्भ ग्रंथ लोक सहित्य–प्रकाशक जनजातीय शोध संस्थान, रांची।

खड़िया

1- अमगा अवनम (लोरेंग टेटे) – पुस्तक (हेपड् अवकड़िअबेर)
रचनाकार–सं0 प्रो0 रोज केरकेट्टा

2- खड़िया निबंध संग्रह – लेखक–प्रो0 रोज केरकेट्टा

3- खड़िया नंदनी – लेखक–नुवस केरकेट्टा

4- पत्तर गो: झुड – लेखक–विश्राम टेटे
(संदर्भ–खड़िया गद्य–पद्य संग्रह–प्रो0 रोज केरकेट्टा)

5- खड़िया भाषा और साहित्य (खड़िया गद्य–पद्य संग्रह) – सं0 प्रो0 संतोष केरकेट्टा

6- खड़िया लोक कथाओं का साहित्यिक एवं सांस्कृतिक अध्ययन – डॉ. रोज केरकेट्टा

7- खड़िया साहित्य का सामान्य परिचय–खड़िया पद साहित्य का विकास, खड़िया गद्य साहित्य का विकास, खड़िया निबंध साहित्य का विकास, खड़िया कहानी का विकास, खड़िया नाटक का विकास, खड़िया कविता का विकास, खड़िया आलोचना का विकास, खड़िया आधुनिक साहित्य का विकास।

8- खड़िया भाषा विज्ञान–खड़िया भाषा विज्ञान की परिभाषा, खड़िया क्षेत्र–विस्तार, महत्व, शाखा–प्रशाखा, भाषा और बोली, भाषा का उत्पत्ति–सिद्धान्त, भाषा परिवर्तन के कारण, भाषा परिवार, ध्वनि–विज्ञान के सामान्य सिद्धांत।

9- खड़िया साहित्य का सैद्धांतिक आलोचना–खड़िया साहित्य की परिभाषा, साहित्य के तत्व, गीत, कविता, कहानी,नाटक, उपन्यास का रचना विधान, शब्द शक्ति और अलंकार–अनुप्रास, श्लेश, यमक, रूपक, विरोधाभास, उपमा और उत्प्रेक्षा।

10- खड़िया लोक साहित्य–

(क) लोक गीत– सामान्य परिचय, भेद–उपभेद, सौन्दर्य चेतना, ऐतिहासिक तथ्य, सांस्कृतिक चेतना, प्रकृति चित्रण, जीवन दर्शन, रस, अलंकार, योजना, छन्द–विधान, भाषिक–रचना, शिल्प, बिम्ब–विधान आदि।

(ख) लोक कथा– सामान्य परिचय, भेद–उपभेद, मिथ, लीजेण्ड, फेबल, अन्य कथाएँ, कथानक, रूढ़ियाँ, ऐतिहासिक तथ्य, सांस्कृतिक अवधारणा, भाषा–शैली, आदि।

(ग) प्रकीर्ण साहित्य– लोकोक्ति, मुहावरा, पहेली, बालगीत, खेलगीत, मंत्र आदि।

संदर्भ पुस्तकें– 1. खड़िया लोकगीतों की पहचान–डॉ0 इग्नासिया टोप्पो,
2. खड़िया लोक साहित्य– सं0 डॉ0 रोज केरकेट्टा,

पंचपरगनिया –

*1.	रामकृष्ट गांगुली केर गीत	–	अनुवादक प्रो0 दीनबंधु महतो
2.	जुलुम (नाटक)	–	सृष्टिधर महतो, समीर
3.	पंचपरगनिया भासा और साहित्य का इतिहास	–	डॉ0 करमचन्द्र अहीर
4.	पंचपरगनिया भासा साहित्य और संस्कृति	–	परमानंद महतो / प्रो0 दीनबन्धु महतो लेखक–करमचंद अहीर
5.	पंचपरगनिया भाषा	–	परमानंद महतो
6.	आदर्श पंचपरगनिया व्याकरण	–	डॉ0 करमचन्द्र अहीर

7. पंचपरगनिया पद साहित्य का विकास, गद्य साहित्य का विकास, निबंध साहित्य का विकास, कहानी का विकास, नाटक का विकास, कविता का विकास, आलोचना का विकास, आधुनिक साहित्य का विकास।
8. पंचपरगनिया भाषा विज्ञान की परिभाषा, क्षेत्र–विस्तार, महत्व, शाखा–प्रशाखा, भाषा और बोली, भाषा का उत्पत्ति–सिद्धान्त, भाषा परिवर्तन के कारण, भाषा परिवार, ध्वनि–विज्ञान के सामान्य सिद्धांत।
9. पंचपरगनिया साहित्य की परिभाषा, साहित्य के तत्व, गीत, कविता, कहानी, नाटक, उपन्यास का रचना विधान, शब्द शक्ति और अलंकार–अनुप्रास, श्लेश, यमक, रूपक, विरोधाभास, उपमा और उत्प्रेक्षा।
10. पंचपरगनिया लोक साहित्य–

    (क) पंचपरगनिया लोक गीत– सामान्य परिचय, भेद–उपभेद, सौन्दर्य चेतना, ऐतिहासिक तथ्य, सांस्कृतिक चेतना, प्रकृति चित्रण, जीवन दर्शन, रस, अलंकार, योजना, छनद–विधान, भाषिक–रचना, शिल्प, बिम्ब–विधान आदि।

    (ख) पंचपरगनिया लोक कथा– सामान्य परिचय, भेद–उपभेद, मिथ, लीजेण्ड, फेबल, अन्य कथाएँ, कथानाक, रूढ़ियाँ, एतिहासिक तथ्य, सांस्कृतिक अवधारणा, भाषा–शैली, आदि।

    (ग) पंचपरगनिया प्रकीर्ण साहित्य– लोकोक्ति, मुहावरा, पहेली, बालगीत, खेलगीत, मंत्र आदि।

नागपुरी –

५.	नागपुरी फाग शतक– 01 से 10 गीत	–	घासी राम
2.	मेवाड़ केशरी	–	सहनी उपेन्द्र पाल 'नहन'
3.	नागपुरी शिष्ट साहित्य	–	डॉ. श्रवण कुमार गोस्वामी
4.	नागपुरी गीतों में श्रृंगार रस	–	डॉ० बी० पी० केशरी
5.	नागपुरी गीतों में छंद रचना	–	डॉ० कुमारी वासन्ती
6.	पीटर शान्ति नवरंगी : व्यक्तित्व एवं कृतित्व	–	डॉ० गिरिधारी राम गौंझू
7.	छोटानागपुर का इतिहास : कुछ संदर्भ, कुछ सूत्र	–	डॉ० बी०पी० केशरी
8.	झारखण्ड के सदान	–	डॉ० बी०पी० केशरी
9.	नागपुरी लोक साहित्य गोछा	–	डॉ० कुमारी वासन्ती (प्र०सं०)
10.	नागपुरी भाषा के कवि एवं काव्य	–	डॉ० त्रिवेणी नाथ साहु
11.	आधुनिक नागपुरी कहानी संग्रह	–	डॉ० त्रिवेणी नाथ साहु
12.	नागपुरी उपन्यास–'पुगरी'	–	शंकर लाल गौंझू
13.	नागपुरी एकांकी नाटक– 'हीरा नागपुर कर हीरा'	–	डॉ० गिरिधारी राम गौंझू

14. नागपुरी पद्य साहित्य का विकास
    नागपुरी गद्य साहित्य का विकास
    नागपुरी एकांकी नाटक का विकास
15. नागपुरी लोक साहित्य–
    (क) नागपुरी लोक गीत में ऐतिहासिक तथ्य, सांस्कृतिक चित्रण, प्रकृति चित्रण, रस, राग–छंद, अलंकार और बिम्ब–प्रतीक
    (ख) नागपुरी लोक कथा – मिथ, लिजेंड, पशु–पक्षी कथा (फेंबुल), सामान्य कथा
    (ग) नागपुरी प्रकीर्ण साहित्य – लोकोक्ति, मुहावरा, पहेली, बाल गीत, खेल गीत

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(1)

Prescribed Books

URDU

۱۔ اردو کی ابتدائی نشوونما میں صوفیائے کرام کا کام حصہ — مولوی عبدالحق

۲۔ قصہ حاتم طائی — حیدر بخش حیدری

۳۔ ابن الوقت — ڈپٹی نذیر احمد

۴۔ بیسویں صدی کے بہترین افسانے (ابتدائی پانچ افسانے) مرتب ڈاکٹر قمر رئیس

۵۔ انتخاب سراج دکنی — مرتب رشید حسن خاں

۶۔ انتخاب کلام درد (ابتدائی چھ غزلیں) — مرتب نثار المصطفیٰ

۷۔ انتخاب کلام مومن (ابتدائی چھ غزلیں) — " عبدالمنان بیدل

۸۔ مراثی انیس و دبیر — مرتب رشید حسن خاں

۹۔ آب حیات — محمد حسین آزاد

۱۰۔ انتخاب خطوط غالب — مرتب ڈاکٹر خلیق انجم

۱۱۔ آنگن — خدیجہ مستور

۱۲۔ [illegible] افسانے منتخب نمبر ۱، ۲، ۵، ۸، ۱۱، ۱۸، ۲۰) مرتب ڈاکٹر اطہر پرویز

۱۳۔ دیوان غالب (ابتدائی دس غزلیں) مطبوعہ غالب انسٹی ٹیوٹ

۱۴۔ بال جبریل علامہ اقبال (مسجد قرطبہ، لینن خدا کے حضور میں، روح ارضی کا آدم سے خطاب اور ابتدائی پانچ غزلیں)

۱۵۔ مثنوی آب و سراب — علامہ جمیل مظہری

۱۶۔ شعلہ و شبنم — جوش ملیح آبادی

۱۷۔ تاریخ ادب اردو (ولی، سودا، درد، نظیر، شاد، میر انیس، سرور، سرسید، حالی، شبلی) — مرتب ڈاکٹر انجم حسین

۱۸۔ تاریخ مسلم (سیرت پاک، خلفائے راشدین) — ثروت صولت

۱۹۔ تنقیدی دبستان — ڈاکٹر سلیم اختر

۲۰۔ جدید تنقیدی نظریات — پروفیسر انور عثمانی

(جدید شاعری، اردو کی ادبی تاریخیں، ترقی پسند نظریۂ ادب، ادب میں اظہار و ابلاغ کا مسئلہ، جدید ادبی تنقید کی تاریخ اور فن میں اسلوب کا مسئلہ)

(۲۱) تنقید و تحریر — پروفیسر احمد سجاد

(ادب کی بنیادی قدریں اور موجودہ رجحان، تخلیق و تحریر، جدید ترقی کے مطالعے، مخطوطہ اقبال کی بنیادیں، افسانہ حل اور رائج)

(۲۲) ہندوستانی لسانیات — پروفیسر محی الدین محمد زور

(زبان کی ارادی تشکیل، دنیا کی زبانیں، جدید ہندآریائی زبانیں، ہندی کی غیر آریائی زبانیں، اردو کی پیدائش کے متعلق مختلف نظریات)

(۲۳) ضادید مجسم — مہدی حسن جعفری

(فارسی ادب کا مختصر تعارف مجوالہ فردوسی، سعدی، حافظ، نظیری، قاآنی، سعدی، حافظ، نظیری، قاآنی، پروین اعتصامی اور علامہ اقبال)

(۲۴) فارسی شعرین

(۲۵) ذرائع ابلاغ — محمد اشفاق

مثلی و پرنٹ نشریات — انجم عثمانی

فن صحافت — عشرت صدیقی

اردو صحافت کی تاریخ — مولانا امداد صابری

طلباء کو ذرائع ابلاغ کی کیفیت اور اہمیت سے روشناس کرانا اور اس فن میں اشتغال ہونے والی تحریروں کی امتیازی شکلوں کی معلومات فراہم کرنا، تاریخی ارتقاء، اخبار، علم، ذرائع، مثلی و پرنٹ، کمیونیکیشن، انٹرنیشنل، ابلاغ عام، فوائد، نظریات، ذرائع ابلاغ کے کام اور ذمہ داریاں، سماج اور ابلاغ عام، ابلاغی اخلاقیات، پریس کونسلوں، قوانین، یونسکو کا اعلامیہ، اہمیت - اجزائے ترکیبی، خبر حاصل کرنے کے ذرائع اور طریقے، اردو صحافت کا آغاز اور ارتقاء، خبروں کی ترتیب، سرخی، اداریہ، استدلالیہ، طباعت اور اس کے مسائل، مختلف پیشوں اور موضوع کے طریق تقاریر، اوسیمی و بصری تقاضوں کی ترتیب، اسکرپٹ، تعلیم اور عورتوں کے مسائل۔

(۲۲) فن ترجمہ نگاری — طلبہ انجم

(مضامین نمبر ۱، ۳، ۵، ۱۰، ۱۱، ۱۲)

(۲۳) ترجمہ کا فن اور روایت — محمد رئیس

(۲۴) اصناف ادب کا مطالعہ۔

(ناول۔ افسانہ، ڈراما، غزل، مثنوی، مرثیہ)

(۲۴) علم العروض۔ — پروفیسر عبدالمجید۔

(۲۵) علم البلاغت — پروفیسر عبدالمجید۔

ODIA

I. History of ODIA Literature

1. Prachina Odisha
2. Lokasahitya
3. Charyapada
4. Natha sahitya
5. Sarala Sahitya (Mahabharata, Bichitra/Bilanka Ramayana, Laxmi Narayan Bachanika)
6. Panchasakha Sahitya
7. Kabya Yuga o Reeti Sahitya
8. Prachina odia Gadyasahitya – Madalapanji, Rudra Sudhanidhi, Chatura Binoda
9. Modern Odia Literature (Poetry, Fictions, Drama & Essays)

Books for Reference:

1. Odia Sahityara Sankhipta Parichaya
2. Odia Sahityara kramaparinama: Nilakantha Das
3. Odia Sahityara Sanskrutika Vikasdhara: Chittaranjan Das
4. Odia Sahityara Adya Parva: Surendra Mohanty
5. Odia Sahityara Madhya O Uttaramadhya Parva – Surendra Mohanty
6. Odia Sahityara Itihas – Surya Narayan Das.
7. Prachina Odia Gadyasahityara Swarupa: Kumuda Ranjan Panigrahi
8. Odia Sahityara Itihas – Natabara Samantanay
9. Sabajaru Sampratika – Nityananda Satpathy
10. Saturiru Sahashrabdi – Nityananda Satpathy
11. Adhunika Odia kabyadhara – Narendranath Mishra
12. Odia Reeti Kabyara Bhitti O Bhuti: Surendranath Nayak
13. Panchasakha Odia Sahitya – Debendra Mohanty
14. Odia Upanyasa – krushna Charan Behera
15. Odia Galpara Vikashdhara: Baishnav Charan Samal
16. Odia Natya Sahityara Itihas- Hemant Kumar Das

II. Odia Language and Script

a. Origin and Development of Odia Script
b. Philology: Bhasa Paribar, Bhasa, Bhasara Utpatti Siddhanta, Bhasa Parivartanara karana, Dhwani Parivawtanara Karana O Diga, Upabhasa.

Refenences.

1. Origin and development of Odia Script- Kunja Bihari Tripathy
2. Bhasa Vignyanara Ruparekha - Basudev Sahu.
3. Odia Bhasatatvara Bhumika – Bansidhar Mohanty
4. Odia Bhasara Upabhasa – Khageswar Mahapatra

III. **Ancient and Medienal literature**

a. **Poetry:**

I. Srimad Bhagavata (Ekadasha Skanda) By Jagnnath Das
II. Rasa kallol – Dinakrushna Das
III. Kishor Chandranana Champu – Baladev Ratha
IV. Samara Taranga – Brajanath Badajena

b. **Prose:**

I. Rudrasudhanidhi – Narayanananda Abadhoota Swami
II. Chatura Binoda – Brajanath Badajena

IV. **Modern Poetry:**

I. Chilika – Radhanath Roy
II. Tapaswini – Gangadhar Meher
III. Alekhika – Godavarish Mishra
Pieces to be studied – a. Abhiram Singh
b. Padmavati
c. Arjun Singh
d. Kalijai
e. Dukhidhana
IV. Samukara Swapna: Radha Mohan Gadnayak
Pieces to be studied: a. Shriya Chandaluni
b. Jasma
c. Rakta O Dugdha

V. **Fictions: Novels and short stories**

(a) Novels : I. Chhamana Athagantha – Phakir Mohan Senapati
II. Matira Manisha – Kalindi Charan Panigrahi
III. Shasti – Kanhu Charan Mohanty
IV. Paraja – Gopinath Mohanty
V. Neelashaila – Surendra Mohanty
VI. Jagnyaseni – Pratibha Roy
(b) Short-Stories – I. Galpa Salpa (Part I) – Phakir Mohan Senapati
II. Monoj Dasanka katha O Kahani – Manoj Das
(Pieces to be studied – 2, 5, 22, 24, 30, 38)

VI. **Drama and one-act Play**

(a) Drama : I. Konarka : Ashwini Kumar Ghosh
II. Ghara Sansara : Rama Chandra Mishra
III. August 9 : Manoranjan Das
IV. Bharasa : Gopal Chhotray
(b) One-act Play : (I) Nutan Ekanki – Nimai Charan Pattanayak
(Pieces to be studied.)
a. Sandhya Asarara Bhuta b. Aabiskara

VII. Literacy Theories (Indian and Western)

a. Indian : I. Rasa
II. Reeti
III. Guna
IV. Dhwani
V. Bakrokti
VI Ouchitya

b. Western: I. Romanticism
II. Classicism,
III. Existentialism (Astitwavada)
IV. Progressive Literature (Pragativada)

Reference:

1. Alankara Prasanga : Govinda Chandra Udgata.
2. Sahitya Tatva : Prachya Paschatya : Jyotsnamayee Pradhan
3. Astitwavadara Marmakatha : Sarat Kumar Mohanty
4. Odia Pragativadi Sahitya – Bijay Kumar Satpathy
5. Odia Upanyasare Astitwavadi Chetana O Anyanya Prabandha – Balakrishna Behera
6. Sahityara Suchipatra : Bibhuti Pattanayak
7. Sahityara Ruparekha : Neeladri Bhushan Hanichandan & Balakrishna Behera

VII. Odia Grammar

Karaka, Bibhakti, Sandhi, Samasa, Rudhiprayog, Chhanda, Alankara,

Reference Book : Sarbasara Byakaran by Shridhar Das

BENGALI

Books Prescribed:

1. Balaka – Rabindra Nath Tagore.
2. Sanchita – Kaji Nazrul Islam.

Pieces Prescribed:

a. Kandari Hunsiar;
b. Fariyad;
c. Amar Kaifiat;
d. Samyabadi (Manus);
e. Sabyasachi;
f. Bidrohi.

3. Jatindra Nath Sengupter Kavita Sankalan (W.B.S. Council)

Pieces Prescribed:

a. Banhi Stuti;
b. Lohar Byatha;
c. Haat;
d. Dukkobadi;
e. Sharsajyay Bhisma;
f. Samadhan;
g. Janmadine.

4. Madhukari-Ed. By Kabishekhar Kalidas Roy

Pieces Prescribed:

a. Srikshetra-Karuna Nidhan Bandopadhyay;
b. Baikali-Satyendra Nath Dutta;
c. Mahakal-Kumud Ranjan Mallick;
d. Bede-Krishanadhan De;
e. Kala Pahar-Mohit Lal Mazundar;
f. Duiti Satya Bani-Jabananda Nanda Das;
g. Charaibeti-Ajit Dutta;
h. Aar Kichhu Nahi Sadh-Buddhadeb Basu;
i. Purano Kagajer Phiriwala-Premendra Mitra.

Books Prescribed:

5. Krishna Kumari-Michael Madhusudan Dutta;
6. Achalayatan-Rabindra Nath Thakur;
7. Chatujje Banrujje-Amrit Lal Basu.
8. Manmatha Royer Ekankika-Ed.By Dr. Chitta Ranjan Laha.

Books Prescribed:

9. Bisbriksha-Bankim Chandra Chatterjee;
10. Chokher Bali-Rabindra Nath Thakur;
11. Charitrahin-Sharat Chandra Chatterjee;
12. Ganadevata-Tara Shankar Bandopadhyay.

Books-

13. Bangla Shityer Itihas-Adi Yug and Madhya Yug (from Charya Pad to Bharat Chandra)
14. Bhasatatwa-Bhasa, Upabhasa, Dhwani Parebartaner Sutra (Dhara), Shabda Bhandar; Shabdartha Tatwa.

Books Prescribed

15. Galpaguchchha(2nd vol.)-R.N. Tagore:

Stories prescribed-

a) Anadhikar Pravesh: b) Atithi; c)Didi; d) Dristidan;
e) Darpa Haran f) Manihara; g) Malyadan; h) Nisithe.

Books Prescribed

16. Kajjali-Parshuram (Rajeshekhar Basu)
17. Sheser Kavita-Rabindra Nath Thakur;
18. Pather Panchali-Bibhuti Bhushan Bandopadhyay.

Books Prescribed

19. Shrikrishna Kirtaner Banshi Khanda-Baru Chandidas Ed. By Dr. C.R. Laha
20. Madhya Yuger Sahitya-Ed. By Dr. C.R. Laha;
21. Baishnab Pada Samput-Ed. By Dr. C.R. Laha; & Narayan Chakraborty;

Pieces Prescribed:

Sri Gouranga Lila Madhuri-Pada Sankhya.

i. (Nidhu Bane Duhujane)
ii. (Gour Lila Darshne),
iii. (Gour Nahito Kemon Haito);

Braja Lila Madhuri (Balya Lila)
Pada Sankhya-

1. (Amar Shapati Lage)
2. (Sridam Sudam Dam); Purba Rag O

Anurag Pada Sankhya 9 (Rupe Bharal Dithi);
Abhisar Pada Sankhya 6 (Mandir Bahir Kathin Kapat);
Prem Baichitta O Akshep Anurag Pada Sankhya 3 (Sai Kato Na Sahibo Jatana)
Mathur Pada Sankhya 1 (Chira Chandan Ure Har Na Dela).
Sadhana O Prarthana Pada Sankhya -2 (Tatala Saikat Bari Bindu Sama).

Books Prescribed:

22. Sharmistha-Michael Madhusudan Dutta
23. Shri Madhusudan-Banaful (Balai Chand Mukhopadhyay)
24. Nabannya-Bijan Bhatacharya
25. Chhenra Taar- Tulsi Lahiri.

Books for Essay

26. Kamala Kanter Daftar-Bankim Chandra Chatterjee, pieces: Eka, Ekti Geet, Amar Durgotsab, Biral, patanga.
27. Bichitra Prabandha: a) Pagal, b) Panero Aana; c) Kekadhwani; d) Naba Barsah e) Sonar Kathi.
28. Prabandha Sangraha-Pramatha Choudhury

Pieces Prescribed:

Shishu Sahitya; Sabuj Patra; Sahitye Khela; Joubane Dao Rajtika & Tarjama.

संस्कृत

1. संस्कृतसाहित्य का इतिहास
(रामायण, महाभारत, पुराण, महाकाव्य, नाटक)
2. संस्कृत शास्त्रों का इतिहास
(आयुर्वेद, ज्योतिषशास्त्र, दर्शनशास्त्र – इनका सामान्य परिचय)
3. मेघदूतम् – पूर्वमेघ,
4. किरातार्जुनीयम् – प्रथम सर्ग (युधिष्ठिरवनेचर संवाद पर्यन्त)
5. रघुवंशम् – द्वितीय सर्ग,
6. शिशुपालवधम् – प्रथम सर्ग
7. कादम्बरी – शुकनासोपदेश
8. शिवराजविजय – प्रथम एवं द्वितीय निःश्वास
9. अभिज्ञानशाकुंतलम्
10. प्रतिमानाटकम्
11. स्नातक वैदिक भाष्य संग्रह – डॉ0 जयनारायण पांडेय
12. कठोपनिषद् – प्रथम अध्याय मात्र
13. वेदांगों का सामान्य परिचय
14. समास प्रकरण (सिद्धांतकौमुदी, समासाश्रय विधि को छोड़कर)
15. कारक प्रकरण (सिद्धांतकौमुदी)
16. पारिभाषिकशब्द
17. काव्यदीपिका
18. छन्द (आर्या, अनुष्टुप, वंशस्थ, भुजंगप्रयात, स्रग्धरा, मंदाक्रान्ता, शार्दूलविक्रीडित, उपजाति, मालिनी)
19. भाषाविज्ञान (भाषा की परिभाषा, भाषा की उत्पत्ति, भाषा की विशेषता, ध्वनिविज्ञान तथा अर्थविज्ञान)
20. अनुवाद
21. निबंध (संस्कृत में)
22. संक्षेपण
23. पत्रलेखन (संस्कृत में)
24. नीतिशतकम्, प्रारम्भिक 25 श्लोक
25. हितोपदेश, मित्रलाभ
26. संस्कृत नाट्यसंग्रह
27. संस्कृत गद्यसंग्रह
28. कृत्य प्रत्यय (लघु सिद्धान्त कौमुदी के अनुसार)

English

Study Of English Literary Movements In Fiction And Texts
(Reading Fiction)
Literary Movements in English Novel

1: The Eighteenth Century Novel

a. The Picaresque Novel
b. The Epistolary Novel
c. The Gothic Novel

2: The Nineteenth Century Novel

a. The Historical Novel
b. The Social Novel
c. The Romantic Novel
d. The Realistic Novel
e. The Regional Novel
f. The Victorian Novel

3: The Twentieth Century Novel

a. The Political Novel
b. The Stream of Consciousness Novel

Books Recommended :

1. A Short History of English Literature.
   -By Sir I for Ivans, Penguin Books, London, England
2. History of English Literature
   -By Edward Albert, Oxford University Press, India, Kolkata
3. The Concise Cambridge History of English Literature
   -By George Sampson, Cambridge University Press, New Delhi.
4. A History of English Literature
   -By Legouis Cazamian
5. A Short History of English Literature
   -By Blamires H, Methuen, London
6. A Short History of English Literature
   -By Sanders, A., Oxford university Press, 1996.

IV-Fiction (Eighteenth Century)

Daniel Defoe- Robinson Crusoe
Samuel Richardson: Clarissa
Tobias Smollet: The Adventures of Roderick Random

V-Fiction (Nineteenth & Twentieth Centuries)

1. Jane Austen : Pride and Prejudice
2. Charles Dickens : A Tale of Two Cities
3. Emily Bronte : Wuthering Heights
4. Thomas Hardy : The Mayor of Casterbridge
5. George Eliot : Silas Marner
6. Mrs. Dalloway : Virginia Woolf

Study of English Literary Movements in Poetry and Texts (Reading Poetry)

1: From the Renaissance to the Eighteenth Century:

1. The Early Renaissance Poetry
2. The Elizabethan Poetry
3. The Metaphysical Poetry
4. The Neo-Classical Poetry

II: The Nineteenth & Twentieth Centuries:

1. The Romantic Poetry
2. The Victorian Poetry
3. The Modern Poetry

Books Recommended :

1. A Short History of English Literature.
   -By Sir I for Ivans, Penguin Books, London, England
2. History of English Literature
   -By Edward Albert, Oxford University Press, India, Kolkata
3. The Concise Cambridge History of English Literature

-By George Sampson, Cambridge University Press, New Delhi.
4. A History of English Literature
-By Legouis Cazamian
5. A Short History of English Literature
-By Blamires H, Methuen, London
6. A Short History of English Literature
-By Sanders, A., Oxford university Press, 1996.

III:

a. Lyrical Poetry
- i. John Donne : Lover's Infiniteness
- ii. Andrew Marvell : To His Coy Mistress
- iii. Lord Byron : When We Two Parted'

b. The Sonnel :
- i. William Shakespeare : Sonnets 29 & 130
- ii. Elizabeth Barret Browning : How Do I Love Thee? Let Me Count the Ways.
- iii. Mathew Arnold : Shakespeare

IV :

a. The Elegy :
- i. Thomas Gray : Elegy Written a Country Churchyard

b. Satire :
- i. Jonathan Swift : A Satirical Elegy on the Death of a late Famous General
- ii. Samuel Johnson : From the Vanity of Human Wishes.

V :

a. The Ode :
- I. S.T. Coleridge : Dejection : An Ode
- II. P.B. Shelley : Ode to the West Wind
- III. John Keats : Ode on a Grecian Urn

Study of English Literary Movements in Drama and Texts (Reading Drama)

II : The Sixteenth & Seventeenth Centuries

a. The Shakespearean Drama
b. The Jacobean Drama
c. The Restoration Drama

II : From Eighteenth Century to the Modern Times

a. Drama in the Eighteenth Century
b. The Modern Drama
c. The Theatre of the Abusrd

(Edward Albee, Eugene lonesco, Samuel Beckett and others)

Books Recommended :

1. A Short History of English Literature.
   -By Sir I for Ivans, Penguin Books, London, England
2. History of English Literature
   -By Edward Albert, Oxford University Press, India, Kolkata
3. The Concise Cambridge History of English Literature
   -By George Sampson, Cambridge University Press, New Delhi.
4. A History of English Literature
   -By Legouis Cazamian
5. A Short History of English Literature
   -By Blamires H, Methuen, London
6. A Short History of English Literature
   -By Sanders, A., Oxford university Press, 1996.

III : Drama (The Elizabethan Age)

a. Macbeth – By William Shakespeare.
b. The Tempest – By William Shakespeare.

IV : Drama (The Modern Age)

a. Candida- By G.B. Shaw
b. The family-Reunion-By T.S. Eliot

Study of English Literary Trends in Prose and Texts
(Reading Prose)

1 : The Fifteenth, Sixteenth & Seventeenth Centuries

a. The Fifteenth Century Prose
b. The Elizabethan Prose
c. The Seventeenth Century Prose

2 : The Eighteenth, Nineteenth & Twentieth Centuries

a. The Eighteenth Century Prose
b. The Victorian Prose
c. The Modern Prose

Books Recommended :

1. A Short History of English Literature.
   -By Sir I for Ivans, Penguin Books, London, England
2. History of English Literature
   -By Edward Albert, Oxford University Press, India, Kolkata
3. The Concise Cambridge History of English Literature
   -By George Sampson, Cambridge University Press, New Delhi.
4. A History of English Literature
   -By Legouis Cazamian
5. A Short History of English Literature
   -By Blamires H, Methuen, London
6. A Short History of English Literature
   -By Sanders, A., Oxford university Press, 1996.

3 : English Essayists

Edited by S. K. Sinha (Oxford University Press, India, New Delhi)

Pieces Prescribed

a. Of Studies- By Francis Bacon
b. Sir Roger at Home – By Joseph Addison

c. Recollections of Childhood – By Richard Steele
d. On National Prejudice – By Oliver Goldsmith
e. Dream – Children : A Reverie – By Charles Lamb
f. On Familiar Style – By William Hazlitt

4 : English Essayists

Edited by S. K. Sinha (Oxford University Press, India, New Delhi)

Pieces Prescribed

a. A Funeral – By E. V. Lucas
b. On the Pleasures of No Longer Being Very Young – By G. K. Chesterton
c. On Superstitions – By A. G. Gardiner
d. On Holidays – By Robert Lynd
e. Trooper Silas Tomkyn Comberbacke – By E. M. Foster.
f. On Getting Off to Sleep – By J. B. Priestley

5 : Modern English Short Stories

Edited by Derek Hudson (Oxford University Press, 1962)

Pieces Prescribed

a. The Duchess and the Jeweller – By Virginia Woolf
b. The Voice – By V. S. Prichett
c. Ever Such a Nice Boy – By William Plomer
d. The Basement Room – By Graham Greene

Literature in the 20th Century & Literary Concepts

1 : Poetry :

Prescribed Anthology of Poems : The Winged Word edited by David Green macmillan Indian Limited 1977)

Pieces Prescribed :

When I was One – and Twenty By A. E. Housman
a. The Second Coming – By W. B. Yeats
b. The Death Bed – By Siegfried Sassoon
c. The Dead – By Rupert Brooke

d. The Love Song of J. Alfred Prufrock By T. S. Eliot
e. Insensibility – By Wilfred Owen
f. Lay Your Sleeping Head, My Love My Wystan Hugh Auden
g. Prayer Before Birth – By Louis Macneice
h. I think Continually of Those Who were Truly Great – By Stephen Spender
i. Wants – By Philip Larkin
j. The Starlight Night – By G. M. Hopkins

II : Fiction

i.	Joseph Conrad	:	Heart of Darkness
ii.	Graham Greene	:	The Quiet American
iii.	V. S. Naipaul	:	A House for Mr. Biswas

III : Drama

i.	Samuel Beckett	:	Waiting for Godot
ii.	T. S. Eliot	:	Murder in the Cathedral

IV : Non Fiction Prose

i.	Virginia Woolf	:	A Room of One's Own
ii.	M. K. Gandhi	:	My Experiments with Truth

V : Literary Concepts

Dissociation of Sensibility, (ii) Objective Correative, (iii) Negative Capability, (iv) Stream of Consciousness Technique, (v) Poetic Diction, (vi) Poetic Justice, (vii) Decadence, (viii) Formalism, (ix) Modernism, (x) Post-Modernism, (xi) New Historicism, (xiii) The Marxist Approach, (xv) Deconstruction , (xvi) Reader-Response Criticism, (xvii) Existentialism, (xviii) Structuralism, (xix) Dadaism, (xx) Freudian Throught, (xxi) Absurdism, (xxii) Colonialism, (xxiii) Post-Colonialism, (xxiv) Post-Structuralism, (xix) Dadaism, (xx) Freudian throught, (xxi) Absurdism, (xxii) Colonialism, (xxiii) Post-Colonialism, (xxiv) Post-Structuralism, (xxv) Symbolism (xxvi) Transcendentalism, (xxvii) Stock response, (xxviii) Positivism, (xxiv) Psychoanalytic Criticism, (xxx) Surrealism.

Books Recommended :

1. NTC's Dictionary of Literary Terms

-By Katheleen Morner & Raulph Rausch NTC Publishing Group, Illinois, USA 1998

2. A Glossary of Literary Terms
   -By M.H. Abrams, Harcourt Asia PTE Limited Singapore, 1999
3. The Making of Literature
   -By R.A. Scott – Games, Secker & Warburd, Londan, 1948

Study of English Literary Criticism

1 Literary Criticism : A Reading

Edited by B. Das & J. M. Mohanty (Oxford University Press, India, 1985)

Pieces Prescribed :

a. From Preface to the Plays of Shakespeare – By Samuel Johnson
b. From Preface to Lyrical Ballads – By William Wordsworth
c. The Fuction of Criticism – By T. S. Eliot
d. The Imagination – By I. A. Richards
e. Dissociation of Sensibility : Modern Symbolist
f. Reading of Literary History – By Frank Kermode
g. From Work to Text – By Roland Brthes

II : English Critical Texts

Edited by D. G. Enright & Ernst Chickera
(Oxford University Press, India, 1962)

Pieces Prescribed :

a. An Essay of Dramatic Poesy - By John Dryden
b. A Defence of Poetry – By P. B. Shelley
c. From the Letters – By John Keats
d. The Study of Poetry – By Mathew Arnold
e. Why the Novel Matters – By D. H. Lawrence
f. The Metaphysical Poets – By T. S. Eliot

III : Critical Appreciation

Critical appreciation of a poem not prescribed for detailed study. The given poem should have at least 12 lines.

Or

Literary analysis of a prose passage not prescribed for detailed study.

Study of the English Language and Old and Middle English Literature

1 :

The English Language : Its Nature, Origin, Growth and functions ; The History of the English Language as Cultural Subject : the Importance of English as a World of language.

2 :

The Indo – European Family of Languages

3 :

Old English : The Roman Conquest; the Latin Languages in Britain; The Germanic Conquest, Anglo-Saxon Civilization, The Origin and position of English , the Periods in the History of English, The Dialects of Old English, Some Characteristics of Old English.

4 :

Foreign influences on Old English ; The Celtic Influences , The Latin Influences, The Influences of Christianity, The Influences of the Benedictine Reform, The Scandinavian Influences, the French Influences, The Greek Influences; Borrowings – Scandinavian, French and Latin

6 :

Laws of Language : Grimm's Law; Verner's Law ; Ablaut; Umlaut

7 :

Medieval Literature : (i) Medieval Verse, (ii) Medieval Drama (iii) The Metrical romances (iv) Medieval Lyrics and Carols, (v) The Miracle Cycles (vi) The Morality Plays.

Suggested Text Books/Reference Books :

1. A History of the English Language
   -By A.C. Baugh & Thomas Cable, Rautledge, Delhi, 1993
2. Growth and Structure of the English Language
   -By Otto Jespersen, Oxford University Press India, New Delhi.
3. A Critical History of the English Language
   -By Anna Kurian, Student Store, Bareilly
4. From Old English to Standard English
   -By D. Freeborn Macmillian, 1992
5. The New Pelican Guide to English
   -Literature Series (Part-I : Medieval Literature)

Study of any one of the following choices :

i. Group "A" : Indian writing in English
ii. Group "B" : Essays
iii. Group "C" : Linguistics
iv. Group "D" : Mass Communication and Journalism

Indian Writing in English

1 : Poetry

Pieces Prescribed

a. Songs of the Hindustanee Minstrel by Henry L. Deorzio
b. The Queen's Rival By Sarojini Naidu
c. Night of the Scorpion By Nissim Ezekiel
d. The Whorehouse in a Calcutta Street By Jayant Mahapatra
e. The Professor Condoles – By Keki N. Daruwalla
f. Heaven of Freedom – By Rabindranath Tagore

[Book Prescribe d : An Anthology of Indian English Poetry, Edited by a Board or Editors, Otient Longman Limited, 1989]

2 : Drama

Book Prescribed : Final Solution : By Mahesh Datoni

3 : Fiction

Book Prescribed :

a. A Bend in the Ganges – By Manohar Malgonkar
b. Nectar in a Sieve – By Kamala Markandaya

4 : Short Story

Pieces Prescribed :

a. The Castaway – By R. N. Tagore
b. The Babus of Nayanjore – By R. N. Tagore
c. The Cow of the Barricades – By Raja Rao
d. The Tiger's Claws – By R. K. Narayan

[Book Prescribed : Selected Short Stories, Chosen & edited by Prof Damodar Thakur, Macmillan India Limited, Chennai, 1978]

Essays

I :

One Literary Essay

II :

One General Essay

Books Recommended :

1. The Quintessence of Literary Essays
   -By W.R. Goodman
2. Spectrum's A Book of Essay

Linguistics

I :

a. Definitions of language, Nature and characteristics of language, Linguistics and the study of language; Languages in contact, Concept of language change, Social aspects of language; Language Variations.

b. Definitions, aims and Scope of linguistics; Levels of linguistics analysis; Branches of linguistics; Definitions of Macrolinguistics and Microlinguistics, Linguistics as a Science.

II :

Concept in Linguistics ; Synchrony and Diachrony; Form and Substance; Competence and Performance; Langue and Parole; syntagmatic and Paradigmatic; Linguistic sign and symbol.

III :

a. Definition of Phonetics, Detailed description of the main branches of Phonetics, Difference between Phonetics and Phonology, Definition of the Phoneme and its characteristics; Phone Allophone, Diaphone; Distinctive Features; Free Variation; Complementary Distribution; Phonetic Environment; Assimilation; Elision.
b. The Organs of Speech : The Respiratory System, The Phonatory System The Articulatory System, Active and Passive Articulators; concept of RP; The Sound of English; Detailed description with examples of the Vowels. The Diphthongs, and the Consonants of RP.

IV :

Definition and Characteristics of Morpheme; Definition of Morphology- What does Morphology study? Difference between Content Words and Function Words; How does the Morpheme differ from a Phoneme? Morphemes find their Phonemic forms; Morpheme and Syllable; Morph, Allomorph, Segmentation; Plural Morpheme and Past Morpheme; Free and Bound Morphemes; Inflection and Derivation.

V :

a. Concept of Phonetic Transcription Difference between Phonemic Transcription and Allophonic Transcription.
b. Broad Phonetic Transcription of English Words.

VI :

a. Concept of Syntax, Scope of Syntax; Definition of the Kernel Sentence; Patterns of the Kernel Sentence in English.

b. Definition of Semantics, Scope of Semantics, Ambiguity; The Relationship between Semantics and Pragmatics; Concepts in Semantics: Sentence, Utterance, Proposition, Difference between a Sentence and an Utterance, Difference between a Sentence and a Proposition, Analytic Sentence, Synthetic Sentence, Contradiction, Entailment, Paraphrase, Sense and Reference Denotation and Connotation.

VII :

a. Applied Linguistics : Why do we study Linguistics?
b. The Relevance of Linguistics of Language Teaching.
c. Linguistics and Literature
d. Contrastive Analysis
e. Error Analysis
f. Indian English and its Characteristics.

Books Recommended

1. Linguistics – By David Crystal (Pelican, 1971)
2. Linguistics – By S.K. Verma (OUP, Delhi, 1974)
3. General Linguistics – An Introductory Survey – By R.H. Robins (Longmans, London, 1967)
4. Elements of General Linguistics – By A Martinet (Faber & Faber, London, 1964)
5. Introduction to Theoretical Linguistics – By J. Ly ongs (OUP, 1968)
6. Introduction to Descriptive Linguistics – By H.A. Gleason (Holt, Rinehart, Winston, New York, 1961)
7. Language By Leonard Bloomefield (Allen & Unwin/Motilal Banarasidas, Indian Edition)
8. Elements of General phonetics – By D. Abercrombie (Faber & Faber, London)
9. A Test Book of English Phonteics for Indian Students – By T. Balasubramanian (Macmillian Indian, New Delhi, 1981)
10. Better English Pronunciation – By J.d.O' Connor (Cambridge University, Press, 1980)
11. Syntactic Structures – By N. Chomsky (the Hague : Mouton, 1957)
12. Aspect s of the Theory of Syntax – By N. Chomsky (Cambridge, M.A. M.I.T. Press, 1965)
13. Semantics By F.R. Palmer (Cambridge University Press. 1976)

14. Structural Semantics – By John Lyons (Oxford, Blackwell)
15. English Pronouncing Dictionary – By Daniel Jones (Cambridge Univesity Press, Cambridge, U.K., 1997)
16. Introducing Applied Linguistics – By S. Pit Corder (Penguin, Middlesex)

Mass Communication and Journalism

I :

1. News, sources of news, news agencies, newspaper organization.
2. The art of reporting, the reporter.
3. Advertising, public relations, house journals.
4. Features, articles, editorials, letters to editor.

II :

1. History of Journalism in India, the regional press.
2. The Press Council of India, Government and the Media, uses and misuses of the press, freedom of the press.
3. Press Laws : Contempt of Court, Libel UNESCO Declaration, Code of conduct for the press.
4. Photo-Journalism, growth of radio and television in India, Cartoons, graphics.

III :

[Copy editing, writing news, writing editorials]

Books Recommended :

1. Theory and Practice of Journalism – By B. N. Ahuja\
2. Mass Communication and Journalism in India – By D.S. Mehta

हिन्दी

प्राचीन एवं मध्यकालीन हिन्दी काव्य

निर्धारित कवि

विद्यापति	–	I. जय जय भैरवि असुर भयाऊनि.....
		II. माधव हम परिणाम निरासा.....
		III. गंगा स्तुति
सूरदास	–	भ्रमर गीत सार सम्पादक – डॉ0 रामचंद्र शुक्ल,
		पद संख्या–01, 03, 06, 08, 10, 13
कबीर	–	कबीर – आ0 हजारी प्रसाद द्विवेदी
		(परिशिष्ट) 2 160 से 170 तक
तुलसीदास	–	अयोध्याकाण्ड
		राम वन गमन, चित्रकूट प्रसंग

अनुशंसित पुस्तकें :

1. विद्यापति पदावली मे लोक–संस्कृति का चित्रण	:	डॉ. प्रमोद कुमार सिंह
2. विद्यापति	:	डॉ. शिवप्रसाद सिंह
3. विद्यापति पदावली के स्रोत	:	डॉ. प्रमोद कुमार सिंह
4. मैथिल–कोकिल विद्यापति	:	डॉ. कृष्णदेव झारी
5. विद्यापति	:	जर्नादन मिश्र
6. विद्यापति अनुशीलन	:	(सं.) डॉ. वीरेन्द्र श्रीवास्तव
7. कबीर	:	डॉ. हजारी प्रसाद द्विवेदी
8. कबीर की खोज	:	(सं.) राजकिशोर
9. कबीर साहित्य की परख	:	डॉ. परशुराम चतुर्वेदी
10. कबीर	:	(सं.) डॉ. विजयेन्द्र स्नातक
11. मध्यकालीन संत साहित्य	:	डॉ. रामखेलावन पांडेय
12. कबीर साहब	:	डॉ. शुकदेव सिंह एवं विवेक दास
13. कबीर : साहित्य और साधना	:	डॉ. वासुदेव सिंह
14. सूरदास	:	(सं.) डॉ. हरवंश लाल शर्मा
15. सूर–साहित्य	:	हजारी प्रसाद द्विवेदी
16. सूर– संदर्भ और दृष्टि	:	सं. डॉ. केशव प्रसाद सिंह एवं डॉ. वासुदेव सिंह
17. महाकवि सूरदास	:	नंददुलारे वाजपेयी
18. तुलसी काव्य–मीमांसा	:	डॉ. उदयभानु सिंह
19. तुलसी : संदर्भ और समीक्षा	:	(सं.) डॉ. त्रिभुवन सिंह
20. बिहारी	:	विश्वनाथ प्रसाद मिश्र
21. बिहारी का नया मूल्यांकन	:	डॉ. बच्चन सिंह
22. बिहारी	:	(सं.) डॉ. ओम प्रकाश
23. बिहारी: व्यक्तित्व एवं जीवन दर्शन	:	डॉ. रमेश चन्द्र गुप्त

आधुनिक हिन्दी काव्य

निर्धारित कवि –

1. भारतेन्दु हरिश्चंद्र	:	सवैया और कविता
2. मैथिलीशरण गुप्त	:	सिद्धार्थ, यशोधरा

3. सूर्यकांत त्रिपाठी निराला	:	भारती वंदना, जागो फिर एक बार, वन–वेला, स्नेह निर्झर बह गया है, मौन रही हार, तोड़ती पत्थर, बाँधो न नाव इस ठाँव बंधु, हारता है मेरा मन ।
4. सुमित्रानन्दन पंत	:	प्रथम रश्मि, नौका विहार, सुख–दुःख, ताज, द्रुत झरो, भारत माता, एक तारा, हिमाद्रि ।
5. महादेवी वर्मा	:	विरह का जलजात जीवन, मैं नीर भरी दुःख की बदली, मधुर–मधुर मेरे दीपक जल, यह मन्दिर का दीप, प्राणों के अंतिम पाहुन, रूपसि तेरा घन–केश–पाश सजल है कितना सबेरा, जो न प्रिय पहचान पाती।

अनुशंसित पुस्तकें :

1. भारतेन्दु हरिश्चन्द्र	:	डॉ. रामविलास शर्मा
2. निराला	:	(सं.) डॉ. इन्द्रनाथ मदान
3. निराला की साहित्य–साधना	:	डॉ. रामविलास शर्मा
4. निराला काव्य का अध्ययन	:	डॉ. भगीरथ मिश्र
5. कवि सुमित्रानंदन पंत	:	नंददुलारे वाजपेयी
6. कवि पंत और उनकी छायावादी रचनाएँ	:	डॉ. पी. आदेश्वर राव
7. सुमित्रानंदन पंत	:	इं. चेलिशेव
8. सुमित्रानंदन पंत	:	डॉ. नगेन्द्र
9. महादेवी का काव्य–सौष्ठव	:	डॉ. कुमार विमल
10. महादेवी की काव्य चेतना	:	डॉ. महेन्द्र मधुकर
11. महादेवी	:	(सं.) डॉ. परमानंद श्रीवास्तव

छायावादोतर हिन्दी काव्य :

1. रामधारी सिंह दिनकर	:	वन फूलों की ओर, हाहाकार, हिमालय का संदेश, मनुज का श्रेय, आलोकधन्वा।
2. सच्चिदानंद, हीरानंद वात्स्यायन 'अज्ञेय'	:	शिशिर की राका–निशा, कलगी बाजरे की, नदी के द्वीप, सूनी–सी सांझ, एक सन्नाटा बुनता हूँ।
3. धर्मवीर भारती	:	टूटा पहिया, फीरोजी होठ, एक प्रश्न, थके हुए कलाकार से, कवि और कल्पना।
4. नागार्जुन	:	बहुत दिनों के बाद, अकाल और उसके बाद, सिन्दूर तिलकित भाल, 26 जनवरी, 15 अगस्त, स्वदेशी शासक।
5. सर्वेश्वरदयाल सक्सेना	:	युद्ध स्थिति, लीक पर वे चलें, कैसी विचित्र है जिन्दगी, वसन्त की इस शाम, नया वर्ष फिर आया।
6. धूमिल	:	आज मैं लड़ रहा हूँ, अकाल दर्शन, लोहे का स्वाद, मैं हूँ मोचीराम।

अनुशंसित पुस्तकें :

1. दिनकर : (सं.)	:	डॉ. सावित्री सिन्हा
2. युगचरण दिनकर	:	डॉ. सावित्री सिन्हा
3. अज्ञेय (सं.)	:	डॉ. विश्वनाथ प्रसाद तिवारी
4. अज्ञेय की कविता	:	एक मूल्यांकन : डॉ. चंद्रकान्त बांदिवडेकर
5. समकालीन बोध और धूमिल का काव्य	:	डॉ. हुकुमचन्द राजपाल

हिन्दी कथा साहित्य

1. मानस का हंस (अमृतलाल नागर)
2. दिव्या (यशपाल)

निर्धारित कहानियाँ :–

1. जयशंकर प्रसाद	:	मधुआ
2. प्रेमचंद	:	निमंत्रण
3. जैनेन्द्र कुमार	:	नीलम देश की राजकन्या
4. निर्मल वर्मा	:	परिन्दे
5. कमलेश्वर	:	दिल्ली में एक मौत
6. उषा प्रियंवदा	:	वापसी

अनुशंसित पुस्तकें :

1. फणीश्वरनाथ रेणु	:	सुरेन्द्र चौधरी
2. फणीश्वरनाथ रेणु : व्यक्तित्व, काल और कृतियाँ	:	गोपीकृष्ण प्रसाद
3. कहानी : नयी कहानी	:	नामवर सिंह
4. आज की कहानी	:	विजयमोहन सिंह
5. नयी कहानी : संदर्भ और प्रकृति	:	देवीशंकर अवस्थी
6. हिन्दी कहानी : प्रक्रिया और पाठ	:	सुरेन्द्र चौधरी
7. हिन्दी कहानी का विकास	:	मधुरेश
8. कुछ कहानियाँ :कुछ विचार	:	डॉ. विश्वनाथ त्रिपाठी
9. प्रेमचंद के उपन्यासों का शिल्प–विधानक	:	डॉ. कमलकिशोर गोयनका
10.हिन्दी कहानी के सौ वर्ष	:	डॉ. वेदप्रकाश अमिताभ
11.समकालीन कहानी: युग–बोध का संदर्भ	:	डॉ. पुष्पपाल सिंह
12.हिन्दी की चर्चित कहानियाँ – पुनर्मूल्यांकन	:	डॉ. कुसुम वार्ष्णेय

पंचम पत्र

हिन्दी निबंध तथा अन्य गद्य विधाएँ

निर्धारित रचनाएँ

निबंधकार–

1. महावीर प्रसाद द्विवेदी	:	साहित्य की महत्ता
2. रामचंद्र शुक्ल	:	लोभ और प्रीति
3. हजारीप्रसाद द्विवेदी	:	देवदारू
4. नन्ददुलारे वाजपेयी	:	साहित्य और जीवन
5. विद्यानिवास मिश्र	:	जमुना के तीरे तीरे
6. वासुदेवशरण अग्रवाल	:	चरित्र का मानदंड
7. रेखाचित्र : महादेवी वर्मा	:	ठकुरी बाबा
8. व्यंग्य : शरद जोशी	:	तुम कब जाओगे अतिथि
9. रिपोर्ताज : धर्मवीर भारती	:	लाल कनेर के फूल

2. ध्रुवस्वामिनी : जयशंकर प्रसाद

हिन्दी भाषा और साहित्य का विकास

पाठ्य विषय–

(क) हिन्दी भाषा का स्वरूप विकास

हिन्दी की उत्पत्ति, पुरानी हिन्दी, अवहट्ट, डिंगल तथा विभिन्न भाषाओं का विकास

हिन्दी भाषा के विभिन्न रूप – (1) बोलचाल की भाषा, (2) रचनात्मक भाषा, (3) राष्ट्रभाषा, (4) राजभाषा (5) संपर्क भाषा, (6) राजकाज भाषा

हिन्दी का शब्द भंडार – तत्सम, तद्भव, देशज, आगत शब्दावली हिन्दी भाषा की निजी प्रकृति और निजी संस्कृति

हिन्दी के प्रमुख वैयाकरण और भाषावैज्ञानिकों के अवदान का संक्षिप्त परिचय

हिन्दी भाषा का मानकीकरण और आधुनिकीकरण

(ख) हिन्दी साहित्य का इतिहास :

हिन्दी साहित्य के इतिहास – लेखन की परम्परा, साहित्येतिहास में काल–विभाजन और नामकरण की समस्या।

आदिकाल– पूर्वमध्यकाल, उत्तरमध्यकाल और आधुनिक काल की सामाजिक, राजनीतिक – सांस्कृतिक पृष्ठभूमि, प्रमुख युग – प्रवृत्तियाँ, विशिष्ट रचनाकार, उनकी प्रतिनिधि कृतियाँ एवं साहित्यिक विशेषताएँ, हिन्दी गद्य की विभिन्न विधाओं का विकास।

अनुशंसित पुस्तकें :

1. हिन्दी भाषा का विकास	:	आचार्य देवेन्द्रनाथ शर्मा
2. हिन्दी भाषा का इतिहास	:	डॉ. धीरेन्द्र वर्मा
3. हिन्दी भाषा का इतिहास	:	डॉ. भोलानाथ तिवारी
4. हिन्दी भाषा	:	डॉ. कैलाशचंद्र भाटिया
5. हिन्दी साहित्य का इतिहास	:	रामचंद्र शुक्ल
6. हिन्दी साहित्य का इतिहास	:	(सं.) डॉ. नगेन्द्र

साहित्य के सिद्धान्त और हिन्दी आलोचना

भारतीय साहित्य सिद्धांत : काव्य–लक्षण, काव्य–हेतु, काव्य–प्रयोजन, काव्य के प्रकार, शब्द–शक्ति, काव्य–गुण, काव्य–दोष।

रस, अलंकार, रीति, ध्वनि, और वक्रोक्ति सिद्धान्तों का सामान्य परिचय।

अलंकार : अनुप्रास, श्लेष, वक्रोक्ति, उपमा, उत्प्रेक्षा, अतिशयोक्ति, काव्यलिंग, विरोधाभास, और दृष्टांत।

छंद : चौपाई, दोहा, सोरठा, हरिगीतिका, उल्लाला, छप्पय, सवैया, कुण्डलिया, बालिनि और मंदाक्रांता।

पाश्चात्य साहित्य सिद्धांत : प्लेटो, वर्डसवर्थ, मैथ्यू आर्नल्ड और आई. ए. रिचर्ड्स के साहित्य सिद्धांतों का सामान्य परिचय।

प्रमुख सिद्धांत और वाद : स्वच्छन्दतावाद, मनोविश्लेषणवाद, बिम्ब, प्रतीक और मिथक।

प्रमुख हिन्दी आलोचक : आचार्य रामचंद्र शुक्ल, आचार्य हजारीप्रसाद द्विवेदी, डॉ. नन्ददुलारे वाजपेयी, डॉ. रामविलास शर्मा।

अनुशंसित पुस्तकें :

1. काव्यशास्त्र	:	डॉ. भगीरथ मिश्र
2. भारतीय काव्य–सिद्धान्त	:	डॉ. नगेंद्र एवं तारकनाथ बाली
3. भारतीय काव्यशास्त्र की भूमिका	:	डॉ. जितराम पाठक
4. पाश्चात्य काव्यशास्त्र	:	डॉ. भगीरथ मिश्र
5. पाश्चात्य काव्यशास्त्र	:	आचार्य देवेंद्रनाथ शर्मा
6. पाश्चात्य काव्यशास्त्र की परम्परा	:	डॉ. सावित्री सिन्हा
7. अलंकार मुक्तावली	:	आचार्य देवेंद्रनाथ शर्मा
8. काव्य के तत्व	:	आचार्य देवेंद्रनाथ शर्मा
9. हिन्दी आलोचना का विकास	:	डॉ. नंदकिशोर नवल
10.हिन्दी समीक्षा – स्वरूप और संदर्भ	:	डॉ. रामदरश मिश्र
11.हिन्दी आलोचना की बीसवी सदी	:	डॉ. निर्मला जैन

वैकल्पिक – 1

प्रयोजनमूलक हिन्दी

खण्ड– क

हिन्दी भाषा और उसका मानकीकरण :

हिन्दी भाषा का स्वरूप, लिपि से अभिप्राय तथा वर्तनी का मानक रूप, हिन्दी की शब्द संपदा और उसके मानकीकरण की प्रक्रिया, हिन्दी भाषा के विभिन्न रूप – सामान्य हिन्दी, साहित्यिक हिन्दी, प्रयोजनमूलक हिन्दी।

प्रयोजनमूलक हिन्दी की अवधारणा और उसका अनुप्रयोग –

प्रयोजनमूलक हिन्दी से अभिप्राय और उसकी परिव्याप्ति, प्रयोजनमूलक हिन्दी की प्रयुक्तियां और उसके प्रयोगात्मक क्षेत्र, प्रयोजनमूलक हिन्दी और पारिभाषिक शब्दावली, प्रशासनिक हिन्दी और उसकी शब्दावली, प्रशासनिक पत्राचार और उसके प्रकार, संक्षेपण, टिप्पण, प्रारूपण, एवं प्रतिवेदन लेखन।

हिन्दी का वैज्ञानिक एवं तकनीकी रूप :

वैज्ञानिक, तकनीकी एवं प्राद्योगिकी क्षेत्रों में हिन्दी, हिन्दी की वैज्ञानिक एवं तकनीकी शब्दावली, हिन्दी में वैज्ञानिक एवं तकनीकी लेखन, हिन्दी कम्प्यूटिंग, अनुवाद की अवधारणा, महत्व और सिद्धांत, रोजगार के क्षेत्र और अनुवाद।

हिन्दी में मीडिया लेखन :

जनसंचार–माध्यम : अभिप्राय, स्वरूप और विस्तार, जनसंचार – माध्यमों के प्रकार समाचार लेखन और हिन्दी।

संवाद – लेखन और हिन्दी

अनुशंसित पुस्तकें :

1. प्रयोजनमूलक हिन्दी	:	डॉ. विनोद गोदरे
2. प्रयोजननूलक हिन्दी	:	डॉ. रवीन्द्रनाथ श्रीवास्तव
3. कामकाजी हिन्दी	:	डॉ. कैलाशचन्द्र भाटिया

4. व्यावसायिक हिन्दी	:	डॉ. दिलीप सिंह
5. हिन्दी में सरकारी कामकाज	:	रामविनायक सिंह
6. प्रयोजनमूलक हिन्दी और कार्यालयी हिन्दी	:	डॉ. कृष्णकुमार गोस्वामी
7. जनसंचार और हिन्दी पत्रकारिता	:	डॉ. अर्जुन तिवारी
8. हिन्दी पत्रकारिता : स्वरूप और संदर्भ	:	डॉ. विनोद गोदरे
9. पत्रकारिता के सिद्धांत	:	डॉ. रमेशचंद्र त्रिपाठी
10. रेडियो और दूरदर्शन पत्रकारिता	:	डॉ. हरिमोहन
11. इक्कीसवीं सदी और हिन्दी पत्रकारिता	:	(सं.) अमरेंद्र कुमार

~~दूत गण~~ – ~~डॉ. राम प्रकाश सिंह, बाबूलाल मधुकर, रवींद्र कुमार~~