SYLLABUS FOR COMMON EDUCATIONAL SERVICES

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SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

ENGLISH

Full Marks: 200

Descriptive:100

Objective:100

GROUP A: DESCRIPTIVE:

Unit 1:POETRY

1. John Donne: Batter My Heart Three Personed God
2. William Wordsworth: Tintern Abbey
3. Robert Browning: My Last Duchess
4. D.G. Rossetti: The Blessed Damozel
5. W.B.Yeats: The Second Coming
6. T.S.Eliot: The Love-song of J.Alfred Prufrock
7. Ted Hughes: The Thought-Fox
8. Robert Frost: Mending Wall

Unit II: FICTION

1. Thomas Hardy: Jude the Obscure
2. Joseph Conrad: The Heart of Darkness
3. Chinua Achebe: Arrow of God
4. Salman Rushdie: Midnight's Children

Unit III: DRAMA

1. John Webster: The White Devil
2. Oscar Wilde: The Importance of Being Earnest
3. Henrik Ibsen: A Doll's l-louse
4. Harold Pinter: The Birthday Party

Unit IV: LITERARY THEORY and CRITICISM

1. T.S.Eliot: Tradition and the Individual Talent
2. Derrida: Structure, Sign and Play in the Discourse of the Human Sciences
3. Elain Showalter: Towards a Feminist Poetics
4. Ronald Barthes: The death of the Author

Unit V: HISTORICAL and LITERARY TOPICS

1. Petrarchism and the Sonnet Cycle
2. The influence of Seneca and Classical dramatic theory
3. Metaphysical Poetry
4. Restoration Drama
5. The Romantic Concept of the imagination
6. The rise of the periodical essay and the Novel
7. The Victorian Novel
8. Absurdism
9. Feminism
10. Modernism and Post-modernism

Unit VI: PHONETIC TRANSCRIPTIONS

Unit VII: COPY-EDITING

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

HISTORY OF INDIA

Full Marks: 200
Essay Type: 100
Objective Type: 100

Unit 1

a) Sources of Indian History

Archaeological sources; Literary sources; Foreign accounts.

b) Pre-history and Proto-history

Paleolithic and Mesolithic Cultures; Neolithic Cultures;
Harappan Civilization.

Unit 2

a) Vedic period

Migration, settlements, evolution of social & political institutions, religious and philosophical ideas, rituals and practices.

b) Period of Mahajanapadas

Formation of States (Mahajanapadas); spread of Jainism and Buddhism.

Unit 3

Mauryan Empire
Post Mauryan Empire

Kushanas, Satavahanas, Sangam Age.

Unit 4

Imperial Guptas and Regional States of India

Guptas, Harshavardhan
Pratiharas, Palas, Rashtrakutas, Pallavas.

Unit 5

Arab invasion of Sindh
Bhakti and Sufi Movements

Unit 6

The Delhi Sultanate

Political developments, Administration, Economic aspect and Socio- cultural life.

Unit 7

The Mughals

Political developments, Administration, Economic aspect and Socio- cultural life. (Akbar, Shah Jahan, Aurangzeb etc.)

Unit 8

India in the 17^{th} – 18^{th} Century

Advent of the Europeans, Rise of British power;
Expansion and consolidation (Robert Clive to Dalhousie)

Unit 9

India under the British Crown

Administration, Economic History and Indian Society in transition

Unit 10

Indian National Movement (Origin & Growth)

- Popular Resistance to Company's Rule: Peasant and tribal movements; Moplah rebellion, Indigo riots, etc. Revolt of 1857: Causes, nature and results.
- Emergence of organized nationalism: Swadeshi Movement; Moderates – Formation of the INC, programme and plans of INC Extremist and Revolutionaries.
- Emerging communal trends: Communalism
- Constitutional development upto 1919
- Rise of Gandhi and the nature of Gandhian Movements: Kheda, Champaran, Mill workers strike, non-cooperation movement, Civil Disobedience movement
- Indian Polity(1939-45) and the Quit India Movement
- INA and Subash Chandra Bose
- Communal Politics and Partition

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

SOCIOLOGY

Full Marks: 200

Descriptive Type: 100

Objective Type: 100

Unit I **Nature and Origin of Sociology:**

Subject-matter of Sociology, Sociological perspective, Sociology and its Relationship with other Social Sciences; the Emergence of Sociology – impact of industrial and French Revolution, Development of Sociological Thought in India.

Unit II **Methods of Sociological Research:**

Scientific method, Research Design, Hypothesis, Sample, Primary and Secondary data, Observation, Interview, Questionnaire and Schedule, Social Survey, Case Study.

Unit III **Pioneering Contributors to Sociology:**

Auguste Comte : Positivism

Herbert Spencer : Social Darwinism, Super-Organic Evolution

Emile Durkheim : Social Solidarity and Suicide

Max Weber : Authority & Protestant Ethic & the spirit of Capitalism

Karl Marx : Materialist Conception of History and Class Struggle

Unit IV **Basic Concepts:**

Society, Community, institution, Association, Social Group, Social System, Social Structure, Status and Role, Norms and Values, Social Action, law and Customs, Folkways and Mores.

Unit V **Society and Individual**:

The individual and Society, personality and Socialization, Social Control; culture: Cultural Traits, Acculturation, Diffusion and Variability.

Unit VI **Marriage, family and kinship:**

Marriage-Types and Forms; Family types, Structure and Function; Changing Structure of Indian Family and Marriage; Kinships-Terms and Usages, rules of Residents, Decent and Inheritance.

Unit VII **Social Stratification and Mobility:**

Forms and Theories of Social Stratification; Caste, Class and Jajmani System; Vertical and Horizontal Mobility

Unit VIII **Social Change:**

Factors and Theories of Social Change, Directed and Non-Directed Social Change, Social Policy and Social Development

Unit IX **Society in India:**

Unity and Diversity, Demographic profile, Rural-Urban Linkages, Scheduled Caste, Scheduled Tribes, Other Backward Classes, minorities, Women.

Unit X **Social Problems in India:**

Gender Inequality, Religious Disharmony, Regional Disparities, Poverty, Corruption, AIDS, Alcoholism, Prostitution, Drug Addiction.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

EDUCATION

Full Marks : 200

Descriptive Type: 100

Objective Type: 100

Unit 1:

Meaning, Nature and Aims of Education. Individual and Social Aims. Schools of Philosophy – Idealism and Naturalism. Meaning and Scope of Sociology – Education as an instrument of social change. Education and Culture. Cultural Heritage of India with special reference to Nagaland.

Unit 2:

Meaning and methods of Educational Psychology, Educational Psychology and the Teacher. Spearman and Thurstones's theory of Intelligence. Characteristics and Development of Creativity. Nature of Learning-Conditioning theories and Insightful learning.

Unit 3:

Principles and factors affecting teaching. Observation of Teacher's Behaviour. Characteristics of good teacher behaviour. Flander's Interaction Analysis. Micro and Macro Teaching. Teaching Methods – Lecturer, Programmed Instruction.

Unit 4:

Meaning, Need of Guidance. Functions of Vocational Guidance – Relationship with Educational Guidance. Concept of Counselling, Steps and Techniques. Aims and Objectives of Curriculum. Principles of Curriculum Construction.

Unit 5:

Modern Trends in Education – Lifelong Education, Open Learning System. National Policies on Education 1986, 1992. Functions of DIET, NCERT, NCTE, UGC. National Adult Education Programme, Communitization of Elementary Education in Nagaland, SSA. Population Education, Women Education, National Curriculum Framework, 2005.

Unit 6:

Modern ideas and Development of Education during 19^{th} and 20^{th} century with emphasis to contribution of Gandhi, Tagore, Dewey, Russell. Educational Trends during Renaissance and Reformation period.

Unit 7:

Nature, Needs and Significance of Educational Planning, Strategies and Steps. Simulated and Distance Learning. Systems Approach in Instruction Process, Mass Media Approach, Personalized System, Computer Assisted Instruction.

Unit 8:

Education in Ancient India – Vedic Education, Aims, Process and System. Buddhist Education, Aims and Curriculum. The four Eternal Truths. Salient Features of Islamic Education. Hunter's Commission 1882. University Education Commission 1902, Calcutta University Education Commission 1917. Hartog Committee Report 1929, Secondary Education Commission 1952, Kothari Commission 1964-66.

Unit 9:

Meaning, Scope of Educational Measurement, concept of Evaluation in education, Difference between Measurement and Evaluation. Characteristics of good Measuring Instrument – Validity, reliability and Objectivity. General Principles of Test Construction and Standardization. Meaning, nature, Scope of Educational Statistics.

Unit 10:

Meaning and scope of Special Education. Role of Rehabilitation Council of India. Educational programme and Placement of Mentally Retarded, Learning Disabled and Gifted Children. Needs and importance of Pre School Education – Objectives and Development. Contribution of Froebel and Montessori. Moral Education inside the School Curriculum.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

PHILOSOPHY

Full marks: 200

Descriptive Type: 100

Objective Type:100

Unit 1: INTRODUCTION

1. Philosophy: Origin, Meaning, History and its relationship to other discipline
2. Nature and distinctive features of Indian Philosophy.

Unit 2: GREEK THOUGHT

1. Pre-Socratic: Pythagoras, Heraclitus, Democritus, The Sophists.
2. Socrates: Concept of Virtue
3. Plato: Doctrine of Ideas
4. Aristotle: Matter and Form

Unit 3: METAPHYSICS

1. Substance: Descartes, Spinoza, Locke; Causation: Hume: Esse est percipi: Berkeley; Monadology: Leibnitz; Space & Time: Kant.
2. Critique of Metaphysics: Kant, Principle of Verification.
3. Samkhya theory of Evolution, Categories of Vaisesika, Sankara and Ramanuja concept of Brahman and the world.
4. Satkaryavada and Asatkaryavada, Buddhist theory of dependent origination.

Unit 4: EPISTIMOLOGY

1. Rationalism & Empiricism , Realism & Idealism
2. Descartes 'Clearness and Distinctness ' , Kant `s synthetic a priori judgements.
3. Theories of truth, Relativism: William James
4. Sources of knowledge, Valid knowledge, Theories of error: Nyaya and Mimamsa school of Indian Philosophy.

UNIT 5: LOGIC

1. Definition and Principles of Logic
2. Deductive Inductive Logic : Nature and use
3. Symbolic Logic: Symbolization, Truth and Validity, The method of deduction.

UNIT 6: ETHICS

1. Nature of morality Moral judgment
2. Concept of Good, Fee will, Niskamakarma Ahimsa
3. Meaning and scope of Bio-ethics

UNIT 7: POLITICAL AND SOCIAL PHILOSOPHY

1. Equality, Liberty, Satyagraha
2. Democracy, Sarvodaya
3. Social Pathology, Gender Issues

UNIT 8: RELIGION AND CULTURE

1. Concept of religion and culture
2. Arguments of God's existence
3. Reason and revelation, religious Pluralism
4. Tribal Culture.

Unit 9: EXISTENTIALISM

1. Existentialism and Humanism
2. Kierkegaard: Subjectivity
3. Sartre: Authencity
4. Nietzsche: Will to Power and Superman
5. Camus: The Absurdity of human condition

Unit 10: CONTEMPORARY PHILOSOPHY

1. Logical Positivism: AJ Ayer, Carnap
2. Linguistic Philosophy: Wittgenstein, Russell, Strawson
3. Post – Modernism, Derrida's Deconstructionism

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

POLITICAL SCIENCE

Full Marks:200

Descriptive: 100

Objective: 100

Unit –I: Political Theory

- Meaning, Nature and Scope
- Liberal and Marxist view of State
- Power and Authority: Sources and forms.
- Justice, Law and Liberty: concept and relationship

Unit – II: Western Political Thoughts

- Plato: Ideal State, justice and education
- Aristotle: Origin and nature of state, Revolution Slavery
- Machiavelli: Prince, religion, morality and politics.
- Thomas Hobbes: Social Contract and Sovereignty

Unit – III: Indian Government and Politics

- The making of Indian Constitution: Basic features and ideologies
- Indian Federalism: Centre – State relations
- Union Government: Parliament, President, Council of Ministers
- State Government: Governor, Council of Ministers
- Party System, Characteristics and kinds

Unit – IV: Public Administration

- Public Administration: Meaning, nature and scope
- Public Administration, Private Administration and New Public Administration, Decision Making, Communication
- Theories of Organization and accountability
- Bureaucracy

Unit – V: Local Self Government

1. Local – Self Government of India: Historical background
2. Local- Self Government and Bureaucracy
3. Women in Panchatyati Raj System
4. Village Council and Village Development Board in Nagaland: Composition and role

Unit – VI: Politics of North East India with special reference to Nagaland:

1. British colonialism and its impact on the hill areas of North East India, administrative, socio-economic, cultural and religion
2. Constitutional Provisions for the Naga Hills District
3. Sixteen Point proposal and creation of Nagaland State
4. Problem of Insurgency, Role of NGO's

Unit – VII: Comparative Government and Politics

- Approaches to the study of Comparative Politics: Traditional, Behavioural
- Characteristics and features of Non- Western(Third World) Political System
- Comparative statement of institutional arrangements of U.K and U.S.A: Legislature, Executive
- Role of Communist Party in Chinese Political System

Unit – VIII: International Politics

- Theories of International Politics: Realist Theory, System theory
- Actors in International Politics: Primary Actors and Non-State Actors
- International Conflicts: Pacific Settlement of disputes, Settlement by force
- World Bank, World Trade Organization: Structure and Activities, International aid as a factor of international Politics.

Unit – IX: Indian Administration

- Public Services: Union Public Service Commission, State Public Service Commission
- Relation between politician and permanent executive
- Central Vigilance Commission(CVC): Structure and role
- Election Commission, Schedule caste and Schedule tribe Commission

Unit – X: International Organizations

1. The aims, objectives and functions of United Nations
2. European Union, ASEAN, SARRC: Structures and functions
3. Demands of NIEO
4. Relevance of the United Nations in the New York World Order

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

PSYCHOLOGY

Full Marks: 200

Time: 3 hrs

Descriptive: 100

Objective: 100

Unit 1

- Psychology-meaning, nature and scope.
- Methods of psychology-observation, interview, case study and experimental method.

Unit 2

- Brain and behaviour
- Left and right hemisphere functions
- Sensory and motor functions
- Heredity and environment

Unit 3

- Learning-classical conditioning
- Operant conditioning(Thorndike's laws)
- Cognitive learning
- Punishment and reinforcement

Unit 4

- Growth and –principles of development
- Stages of development characteristic of infancy, childhood, adolescent stage
- Physical, cognitive, socio-emotional development in early, middle and later stages

Unit 5

- Motivation and emotions
- Needs, drives, incentives
- Functions of emotions
- Maslow's theory of motivation and their applications

Unit 6

- Memory – encoding, storage and retrieval of memory
- Factors influencing forgetting, short term and long term memory

Unit 7

- Intelligence and aptitude
- Definition and concept. Measurement of intelligence and aptitude
- Exceptional intelligence, mental retardation, emotional and artificial intelligence and their applications.

Unit 8

- Personality
- Nature. Trait v/s type approach.
- Biological and socio-cultural determinants of personality.
- Personality assessment technique, objective and projective.

Unit 9

- Guidance and Counselling
    - Meaning, aims, needs and types
    - Techniques of guidance-role playing, career counselling, case study, interview.
    - Areas of counselling – educational, vocational, personal, occupational guidance programme.

Unit 10

- Individual difference and its implications.
- Exceptional children-meaning, needs and education of exceptional children
- Needs of special education.
- Delinquent children-types, characteristics, causes and prevention.

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TENYIDIE

Full Marks:200

Descriptive Type: 100

Objective: 100

La I. Keriekimia geizo (classical poetry).

(1) Nie pie nuo (2) Merielhou (3) Phoutheguo-o (4) Nuolhou pese
(5) A kesuoü (6) Thenu nie we (7) Gareiphezou (8) Socüzou-o
(9) Miakrüo (10)Tso-o mu Therhuopudiü.

La II. U Teiki geizo (Modern poetry).

(1) Tenyimie vierhe : D.Kuolie
(2) Nagaland : D.Kuolie
(3) U tsiepfumia : D.Kuolie
(4) Ketho mu kevi : Kekhulhu
(5) Krüta kevi : Medo
(6) Puo lie mu ketho : Medo
(7) Kralie modi ramei pfüya mo : Medo
(8) U phiya kerieu : Guoviü
(9) U nuo rüli : Guoviü
(10) Tsiedo kelhou : Tshuneilie
(11) Nagamia : Dino
(12) Khepeziyaluo : Dino
(13) Nhicu zha : Dino
(14) Vitho kedi : Meguo-o
(15) Kedzükrilie khe : Meguo-o
(16) Themia kelhou : Vilakiehu
(17) Keviu u ya : Vilakiehu
(18) Kedietho mu kekhrie : Lhovio
(19) Merünuo : Khrürülü
(20) Kiya thapfü : Guoviü

La III. Rüsie (Drama)

(1) Mehouviü – Morüsa : Shürhozelie
(2) Teikado kedukhrie : Shürhozelie
(3) Thenudiü : Vilhouzalie
(4) Jakob mu puo nuonuoko : Shürhozelie

La IV. Diemvü dze (Literary history)

(1) Tenyimia diemvü dze : Rev.Beilieü Shüya
(2) Tenyidia dze : Shürhozelie
(3) Diechie : Shürhozelie

La V. Noudo dze (Fiction)

(1) Thenupfü : Thinuokhrieü
(2) Rhülie kengu kerieu : Vikielie Sorhie
(3) Kedietho capiu : Kekhrievoü
(4) Puo a meho tha zo : Shürhozelie

La VI. Tenyidie pede dze.

(1) U tsiepfumia rüve : Shürhozelie
(2) Tenyimia kelhou dze : Neichüriezo
(3) Tenyimia kelhou bode : Vikielie Sorhie
(4) Tenyimia kelhou : Kiezotuo Zhale

La VII.Tenyimia dzewe.

(1) Tenyimia dzeyie : Rüzhükhrie Sekhose
(2) Phousanyi : Shürhozelie
(3) U tsiepfumia mhasi bode : Rev.Dr V.K Nuh

La VIII.Tenyidie Thuyie

(1) Kekhriengunuo : D.Kuolie
(2) Sikezhü dze : Shürhozelie
(3) Methuophemia : Shürhozelie
(4) Pejokewau : Shürhozelie

La IX. Tenyimia diemvü rhitho mu thete

(1) Diemvü thete zho : D.Kuolie (2) Diemvü rhitho bodeko : D.Kuolie

La X. Linguistics

Definition of language, classification of sounds into vowels and consonants , manner and places of articulation , suprasegmentals of pitch , tone and intonation with reference to Tenyidie, TPA and its application

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

GEOGRAPHY

Full Marks:200

Descriptive Type: 100

Objective: 100

● **INTRODUCTION TO GEOGRAPHY: UNIT I**

The nature of Geography: Objective and relevance; Place of Geography in the Classification of Sciences; Geography and other discipline.Physical geography: (Geomorphology, Climatology & Oceanography)

● **GEOMORPHOLOGY (A): UNIT II**

(i). The nature and scope of Geography; inter-relation of Geography with other branches of earth sciences, the place of Geomorphology in physical geography.
(ii). Seismological evidence for the study of the interior of the earth, Isostasy and an outline of plate tectonics.

● **GEOMORPHOLOGY (B): UNIT III**

(i). Earth movements &orogenic and Eperogenic, Wegener's theory of continental drift.
(ii). The Geomorphic cycle, views of W. M. DAVIS and PENCK

● **CLIMATOLOGY: UNIT IV**

(i). Definition and significance of climatology, Elements of weather and climatic; their causes; composition and structure of the atmosphere.
(ii). Atmospheric pressure and winds; Planetary, periodic and local winds, atmospheric disturbances-Cyclones, thunderstorms and tornadoes.
(iii). World classification of climates; Koppen and Thornwaits.

● **OCEANOGRAPHY: UNIT V**

(i). Relevance of Oceanography in earth and atmospheric sciences.
(ii). Surface configuration of the ocean floor, continental shelf, continental slope, Abyssal plain.
(iii). Marine deposits and coral reefs, circulation of oceanic waters; waves, tides and currents, Relief and currents of the Atlantic, Pacific and Indian oceans.
(iv). Distribution of temperature and salinity of oceans and seas, oceans as storehouse of resources for the future.

● **HUMAN GEOGRAPHY: UNIT VI**

(i). Nature and scope of Human Geography; Branches of Human geography and approaches to the study of human geography.
(ii). Concepts of Man environment relationship, Human adoption to the environment with special reference to cold region(Eskimo). Hot region(Bushman&Bedouin) mountains region (Nomads).
(iii). World distribution of population pattern-physical, economic and social factor influencing spatial distribution of world population and population migration.
(iv). Human settlement patter-rural-urban settlement, socio-economic and geographical factors influencing world's human settlement patterns.

● **ECONOMIC GEOGRAPHY: UNIT VII**

(i). Definition-Nature-Scope-recent trends and importance of Economic geography.
(ii). Sectors of economy-Primary (Agriculture, fishing etc) Secondary(Industry, Education and Tertiary (transport, trade & commerce etc), the impacts of economic activities on environment.
(iii). Classification of Natural resources- Renewable and Non- renewable biotic and abiotic.
(iv). Trade- National and International; World Trade Organization (WTO), Globalization and their effect on developing countries of the world.

● **GEOGRAPHY OF INDIA: UNIT VIII**

(i). Study of India based on Physiography, Climate and Natural vegetation.
(ii). India in the context of Southeast and South Asia; a land of diversities; unity within diversities.
(iii). Agriculture; Types, Problems and prospects, Green revolution and agricultural development planning.
(iv). Mineral and Power Resources.
(v). Major industries-Factors for location of industries and distribution.
(vi). Population – Growth since 1901/1951, distribution and density.

● **GEOGRAPHY OF NORTH-EAST INDIA: UNIT IX**

(i). Physiography, Geological Structure, Climate, Soil types and Natural vegetation.
(ii). Agriculture-Types and Problems
(iii). Resources; Forest, Mineral, Power and Human Resources.
(iv). Industries – Manufacturing and Cottage industries, their problems and prospects, transport and communication.

● **GEOGRAPHY OF NAGALAND: UNIT X**

(i). Physical features, climate-type, different seasons and their characteristics.
(ii). Agriculture – Types and Nature, Agricultural product and problems.
(iii). Industries – Small and Cottage, Tourism their prospects and problems.
(iv). Transport and Communication – problem and prospects.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

ECONOMICS

Full Marks: 200
Descriptive Type: 100
Objective: 100

Unit-I: Statistics

Measure of Central tendency-mean, median and mode.
Measure of Dispersion-mean deviation, quartile deviation, standard deviation. Correlation-meaning, scatter diagram, measure of correlation.
Index number and Time series analysis-meaning, types and uses.

Unit-II: Indian Economy

Basic features of Indian economy. Population, causes and effects, measures to control. Poverty, Unemployment-meaning, causes, effects and measures. Planning – their objectives, broad achievement and failures, Current Five Years Plan-Objectives, targets and allocation. New Economic Reforms-Liberalization, Privatization, Globalization. Industrial Policy of 1948, 1956 and1991.

Unit-III: Micro Economics

Nature and scope of economics. Concepts of Demand and Supply, Equilibrium and Disequilibrium, Elasticity of demand and supply. Theories of Consumer demand-Utility approach like Cardinal, Ordinal. Indifference curve, consumer equilibrium(Hicks and Slutsky theorem). Theories of Production and Cost- Laws of variable proportions and return to factors. Cobb Dauglas production function, Least cost combination of inputs. Market structure and pricing-Different types of markets, features and price output determination. Theories of wages and rents.

Unit-IV: Macro Economics

Concepts and measurement of National Income. Theory of Classical employment, Keynes theory of employment and its determination. Consumption Function, Investment Function. Equilibrium of Saving and Investment, General Equilibrium-IS-LM Curves. Trade Cycle-Hawtreys and Keynes theory of trade cycle. Concept of accelerator-Samuelson and Hicks model.

Unit-V: Money and Banking

Commercial Banks-functions, credit creation, objectives and limitations.
Central Bank-Role and Function of Reserve Bank of India.
Quantity Theory of Money-cash transaction approach, cash balance approach, Keynesian approach, inventory approach and portfolio approach of the demand for money.

Unit-VI: International Economics

The basis of International Economics-interregional and international trade.
Theories of absolute advantage, comparative advantage, Heckscher- Ohlin theory and Leontief paradox. Gain from Trade-trade as an engine of economic growth.
International Monetary System-function and policies of IMF, World Bank, GATT/WTO.

Unit-VII: Development and Planning

Theories of Development -classical, Marx, Schumpeter theory.
Economic Growth-Harrod & Domar and Solow's model.
Approach to development-balance growth, critical minimum effort and big push theory.

Unit-VIII: Public Finance

Meaning and scope of public finance-objectives of fiscal policy, the principal of maximum social advantage.
Public Expenditure-Canons and effects of public expenditure. Trends in public expenditure, causes of growth in expenditure in India.
Public debt-Sources and types of public borrowing.
Growth and burden of public debt in India.
Taxation-kinds, impact and incidence of taxation.

Unit-IX: Industrial Economics

Industrial finance-types and sources of finance. Choice of finance;
External vs External. Industrial Financial Institution in India. Industrial growth and pattern-Small and Cottage industries. Pricing Decisions-theories, pricing and policies. Industrial location analysis-determinants and approaches to industrial location analysis.

Unit-X: Agricultural Economics

Role and importance of agriculture in economic development.
Globalization and its impact on Indian agriculture.
Agricultural growth and Productivity-trends in agricultural growth and productivity. Land reforms-programmes and performance since 1947. Technological changes in agriculture-techniques and practices, HYV seeds, fertilizers, green revolution, and emerging trends in Indian agricultural technology. Agricultural finance and Marketing-types, sources and failure.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

BOTANY

Full Marks:200

Descriptive Type: 100

Objective: 100

Unit 1: Bacteria, viruses, microbiology and plant pathology

Ultra structure and reproduction of bacteria and viruses (TMV and bacteriophage). Economic importance of bacteria in nitrogen fixation. Host – parasite interaction mechanism. Rust of wheat, early and late blight of potato.

Unit 2: Cryptogams

Algae: Range of vegetative and reproductive structure. General account of cyanophycene, Chlorophyceae, Bacillariophyceae, and Rhodophyceae. Economic importance of algae.
Fungi: Mode of nutrition. Economic importance of fungi and lichens. & MycarrlizaeLichens
Bryophytes: Origins; Range of thallus structure; Evolution of Sporophyte; Alternation of generation.
Pteridophytes: General account; State; Heterospory: and seed habit.

Unit 3: Gymnosperms and Palaebotany

Evolutionary trends; Reproduction in pinus; Dominant floras through the ages: Role of palaeobotany in oil and coal exploration.

Unit 4: Angiosperms

Microsporogenesis; Megasporogenesis; Development of embryo an dendosperm; Anamalous secondary growth; Taxanomic studies of Asteraceae, Mallvaceae, Poaceae.

Unit 5: Cell Biology

Structure and functions of – cell wall, Endoplasmic reticulum, Golgi apparatus, Mitochondria, Ribosomes, Plastids, Mitosis, Meiosis.

Unit 6: Plant Physiology

Photosynthesis; Respiration; Absorption and Translocation of water; Macro and micro elements; Growth regulators.

Unit 7: Biochemistry

Structure and functions of enzymes; carbohydrates, lipids and proteins; protein synthesis.

Unit 8: Plant breeding, Genetics and Bioinformatics

Techniques of plant breeding; Tissue culture; Genetic code, chromosomal aberrations; DNA; RNA; - Structure and function; Biosynthesis of amino acids; DNA finger printing; PCR; PDB; GDB.

Unit 9: Ecology and Environment

Concept of ecology; Adaptations; Population-growth and interactions; Plant Community; Succession: Ecosystem: Concept and levels of prophics: plant conservation; afforestation.

Unit 10: Economic and Applied Botany

Study of cultivated plants-origin, as sources of food, fibre, spices, beaverages, timber; medicinal plants; ornamental plants; pesticides and insecticides plants; cold storage; Green house. Cash crops and other cultivated plants of Nagaland

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

CHEMISTRY

Full Marks: 200

Descriptive Type: 100

Objective: 100

A. Inorganic Chemistry

Unit-1

Atomic structure:-

Idea of Broglic matter waves, Heisenberg Uncertainty principle, atomic orbitals, Schrodinger wave equation, significance of Ψ and Ψ², Quantum numbers, radial and angular wave functions and probability distribution curves, shapes of s, p, d orbitals. Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements, effective nuclear charge.

Nucleus and Radioactivity:-

Fundamental particles(electron, proton, neutron, positron, neutrino and mesons); nuclear binding energy, mass defect and packing fraction; half-life period; group displacement law; balancing of nuclear reactions; artificial radioactivity; elementary ideas of fission, fusion and atomic energy; first order decay kinetics rate equation; principles of nuclear reactors.

Ionic Solids:-

Ionic structure, radius ratio effect and coordination number, limitation of radius ratio rule, lattice defects, semiconductors, Born-Haber cycle, Fajan's rule, Metallic bonding, Hydrogen bonding and Van der-waals forces.

Unit-2

Periodic properties:-

Atomic and ionic radii, ionization energy, electron affinity and electro negativity, trends in periodic table and applications in predicting and explaining the chemical behaviour.

Chemical Bonding:-

Valence bond theory and its limitations, directional characteristics of covalent bond, hybridization and shapes of simple inorganic molecules. Valence shell electron pair repulsion(VSEPR) theory. Molecular orbital theory, homonuclear and diatomic molecules, bond strength and bond energy.

Hard and Soft Acids and Bases(HSAB):-

Classification of acids and bases as hard and soft. Pearson's HSAB concept, acid-base strength and hardness and softness. Symbiosis.

Coordination Compounds:-

Werner's coordination theory, effective atomic number concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory of transition metal complexes.

Unit-3

s and p-Block elements:-

Group discussion of the s-block elements(atomic and ionic radii, ionization potential, electron affinity, electronegativity, oxidation states, oxides, hydrides and halides). Comparative studies of groups 13-17 element, study of hydrides, oxides and halides of p-block elements. Chemical properties of the Nobel Gases, Chemistry of Xenon, structure and bonding in Xenon compounds.

Chemistry of d-block elements(First Transition Series):-

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.

Chemistry of Lanthanide and Actinide Elements:-

Electronic structure, oxidation states and ionic radii and lanthanide contraction. General features and chemistry of Actinides, comparison between actinides and lanthanides.

B. Organic Chemistry

Unit-1

Bonding in organic molecules:- Hybridization of orbitals, shapes of simple molecules-CH_4, H_2O, C_2H_4, C_2H_2, NH_3;implications of hybridization on the concept of bond length, bond energy.

Electron displacement in a covalent bond: - Conjugation, inductive effect, resonance, hyperconjugtion (propene and toluene), hemolytic and heterolytic bond cleavage.

Stereochemistry: - Isomerism-Structural, geometrical, optical and conformation.

Coal, petroleum and petrochemical:- Carbonization of coal, cracking, knocking, flash point, LPG, synthetic petrol.

Unit-2

Alkanes: - Physical and chemical properties(oxidation, cracking aromatization) Wurtz reaction, Kolbe reaction, Corey-House reaction.

Cycloalkanes: - General method of preparation of Cycloalkanes(upto cyclohexant) and their reactions with halogens, Baeyer strain theory and its limitation.

Alkenes & alkynes: - Mechanism of hydrogenation, rumination, hydroboration, Markonikoff's rule, peroxide effect, Friedel crafts reaction, polymerization, comparative acidity of ethane, ethene and ethyne.

Contd…

Aromatic hydrocarbons and aromaticity: - Structure of benzene, resonance, energy aromaticity, Huckel's (4π +2) rule and its applications to simple molecules.

Unit-3

Alcohols & Phenol: - Classification of alcohols, methods of preparation, Chemical reactivity. Preparation of phenol, physical properties and acidic character of phenols, Reimer-Tiemann reaction.

Ethers: - Method of formation, chemical reactivity-cleavage and autooxidation.

Aldehydes and ketones: - Methods of preparation of Aldehydes and ketones(both aliphatic and aromatic) chemical reactivity of carbonyl groups, Canizarro's reaction.

Carboxylic acid: - Methods of preparation, chemical reactivity, acidity of carboxylic acids, effect of substituents on acid strength. Hell-Volhard-Zelinsky reaction.

Unit-4

Alkyl & Aryl halides: - Method of formation, chemical reactions, SN1 and SN2 reaction of alkylhalides. DDT and BHC.

Amines: - Methods of preparation of amines, chemical reactivity-Alkylation, acylation, action of nitrous acid, carbylamine reaction, condensation with carbonyls group.

Carbohydrates: - Classification, reaction of glucose and fructose with HCN, tollens, reagent, fehlings solution.

Amino acids: - Classification, synthesis of L – amino acids, Gabriel synthesis of glycine, alanine, isoelectric points and Zwitterions.

Dyes: - Chromophore, auxochrome, synthesis of methyl orange, Bismark brown malachite green.

C. <u>PHYSICAL CHEMISTRY</u>

Unit-1

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, De Broglic hypothesis, the Heisenberg's uncertainty principles, Schrodinger wave equation and its importance, physical interpretation of the wave function.

Thermodynamics: -

Thermodynamics terms, First law of Thermodynamics, internal energy and enthalpy. Heat capacity, Joule- Thompson coefficient and inversion temperature.

Second law of thermodynamics, Carnot cycle and efficiency, thermodynamic scale of temperature, entropy changes for an ideal gas and for a spontaneous process.

Third law thermodynamics.

Unit-2: -

Thermochemistry: -

Standard state, standard enthalpy of formation- Hess's law of heat summation and its applications, heat of reaction at constant pressure and at constant volume, enthalpy of neutralization, Bond dissociation energy, temperature dependence of enthalpy, Kirchoff's equation.

Electro Chemistry: -

Specific conductance and equivalent conductance, variation of equivalent and specific conductance with dilution. Kohlrausch law, Arrhenius theory, its limitation, weak and strong electrolyte, Oswald's dilution law, and limitation Debye-Huckel-Onsanger's equation for strong electrolytes(elementary treatment only). Transport number-determination by Hittorf method and moving boundary method. Nernst equation.

Photochemistry: -

Laws of photochemistry: Gtothus-Drapper law, Stark-Einstein law, Jablonski diagram, Quantum yield, photosensitized reaction.

Unit-3

Solution and Colligative properties: -

Ideal and non-ideal solutions, Colligative properties, Raoult's law, relative lowering vapour pressure, Osmosis, law of osmotic pressure and its measurement, elevation of boiling point and depression of freezing point, Abnormal molar mass.

Chemical Kinetics: -

Rate of reaction, orders of reaction, half life period. Determination of first order of reaction, Radioactive decay as a first order phenomenon.

Phase Equilibria: -

Statement and meaning of the terms – Phase, component and degree of freedom, derivation of Gibbs phase rule, phase Equilibria of one component system – water, CO_2 and S systems.

Chemical Equilibrium: -

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

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

PHYSICS

Full marks: 200

Objective Type: 100

Descriptive Type: 100

1. Mechanics & Properties of Matter: -

Laws of motion, motion in uniform field, velocity and acceleration indifferent coordinate systems, uniformity rotating frame, centripetal acceleration.
Kepler's laws, gravitational law, gravitational field and potential, potential due to spherical body.
Centre of mass, equations of motion, conservation of linear and angular momentum, conservation of energy.
Rotational motion, moment of inertia with examples, Euler's equation.
Elasticity, Hooke's law, Elastic constant and their relationships, Bernoulli's theorem, stokes law, surface tension and surface energy.

2. Heat & Thermodynamics: -

Kinetic theory of gases, pressure exerted by ideal gas, kinetic energy, interpretation of absolute temperature, root mean square (RMS) velocity.
Van Der Waals gas, equation of state, Joule expansion of ideal & Van der Waals gas, Joule coefficient, Clausius clapeyron heat equation.
Thermal conductivity, thermal diffusivity, Entropy. First law of thermodynamics, isothermal & adiabatic changes, second law of thermodynamics, reversible & irreversible changes, Carnot cycle& Carnot heat engine.
Black body radiation, Stefan- Boltzmann law, Wein's displacement law, Rayleigh-Jean's law and Planck's law.

3. Optics-geometrical, physical & laser:

Fermat's principle, cardinal points, eyepieces, spherical & chromatic aberrations, achromatic combination of lenses.
Interference of light, principle of superposition, Fresnel's biprism, Newton's rings, Michelson's interferometer, determination of wavelength of light.
Diffraction of light, Fresnel and Fraunhofer diffraction, diffraction at single slit and at straight edge, half period zone.
Polarization of light, Brewster's law, Malus law, propagation of plane wave in uniaxial crystal, ordinary & extraordinary ray of light, half wave plate, quarter wave plate, Nicol prism.
Principle of LASER, He-Ne laser, population inversion.

4. Oscillations, Waves, Acoustics: -

Simple Harmonic Motion (SHM), differential equation of SHM and its solution for free vibrations, forced and damped vibrations, condition for maximum amplitude, sharpness of resonance.
Speed of transverse waves in uniform string, speed of longitudinal waves in a fluid, group, velocity, phase velocity, standing waves, beats.
Acoustic impedance of a medium, acoustics of halls, reverberation period, Live and Dead room, Sabine's formula.

5. Electrostatics and Magnetostics:

Coulomb's law, electric field and potential, torque on a dipole in a uniform electric field, Gauss's theorem and its application, parallel plate capacitor with air and dielectric media, energy of a charged capacitor.
Force on a moving charge, Lorentz force equation and definition of magnetic field induction(B), force on a straight conductor carrying current placed in uniform magnetic field, torque on a current loop.
Biot-Savart law, magnetic field at the axis and at the centre of a circular loop, Ampere's law and its application, Electromagnetic induction, Faraday's laws of EM induction, Lenz law, self and mutual induction, Maxwell's displacement current, Maxwell's equations.

Contd…

6. Quantum Mechanics:

Photoelectric effect , Einstein's equation for photoelectric equation , Compton effect , Determination of Planck's constant by Millikan's experiment , wave particle duality , uncertainty principle , De Broglie hypothesis for matter waves , Experimental demonstration for particle wave , uncertainty relation for p and x , its extension to energy and time , position of electron in Bohr orbit.

Schrodinger's time dependent and time independent equations, postulatory basis of quantum mechanics, operators, solution of Schrodinger equation for one dimensional rectangular harmonic oscillator.

7. Solid State Physics:

Lattics and bases , unit cell , Wigner-Seitz cell , allowed rotations , lattice types , lattice plans , reciprocal lattice , Miller indices , common crystal structures.

Lattice vibrations, concept of phonons, optical and acoustic modes, Brillion zones, Finstein and Debye model, lattice specific heat, and low temperature limit.

Free electron theory, valance band, conduction band, forbidden energy gap, Fermi energy, and classification of solids on the basis of band theory.

Super conductivity, type I and type II superconductors.

8. Nuclear and Molecular Physics:

General properties of atom, determination of electronic charge by Millikan's experiment, e/m of electron by Thomson's method, Aston's mass spectrograph, and atom models.

Pauli's exclusion principle, quantum numbers, spectra of hydrogen like atoms, double fine structure.

Continuous and characteristic x-ray spectra, Duane and Hunt's law, Moseley's law, x-ray absorption spectra.

Quantisation of vibrational and rotational energies, pure rotational spectra , vibration – rotation spectra of molecule , electronic spectra of molecules , transition rules for pure spectra.

Stoke's and antistoke's lines, complimentary character of Raman and infrared spectra.

9. Nuclear and Particle Physics:

Composition of nucleus , Rutherford's alpha scattering experiment , properties of nucleus – charge , mass , size , magnetic moment , electric qudrupole moment , density , binding energy , variation of binding energy per nucleon with mass number (A).

Radioactivity - ∀, β and √decay, Gamone's explanation of -decay, Geiger –Nuttal law.

Nuclear reactions , Q-value of a nuclear reaction , threshold energy , cross section for a nuclear reaction , discovery of neutron , properties of neutron , secondary neutrons , nuclear fission , chain reaction , nuclear fusion.

Primary and secondary cosmic rays, cosmic ray showers, discovery of positron, muon, pion, lepton, baryon and mesons, concept of anti particles, quark hypothesis.

10. Electronics and Relatively:

P and N types of semiconductors , PN junction diode , depletion layer , PN junction diode as half and full wave rectifier , transistors , transistor as an amplifier , transistor characteristics in CB , CE and CC modes , Zener diode , RC coupled amplifier , Transistor coupled amplifier.

Reference system , inertial frames , Galilean transformations , Newtonian relativity , Michelson-Morley experiment , Lorentz transformation , time dilation , length contraction , variation of mass with velocity , particle with zero mass.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

ANTHROPOLOGY

Full marks: 200
Objective Type: 100
Descriptive Type: 100

Unit: 1

1. Meaning and scope of Anthropology, history of Anthropology, branches of Anthropology.
(a) Basic concept of Biological Anthropology: Human evolution, Human variation, Human Genetics, Human growth and development
(b) Basic concept of Social-cultural Anthropology: Culture, Society, Community, Group, Institutions etc.
(c) Fundamentals of Archaeological Anthropology: Origin of tool making, tool typology & technology, Cultural evolution: broad outlines of prehistoric culture, chronology: definition, basic concept, methods of dating.
2. Anthropology relationship with other Life sciences, Earth sciences, Medical sciences, Social sciences, Humanities, Environmental sciences.

Unit: 2

(1) Theories of organic evolution: Lamarckism, Darwinism, Synthetic theory of Evolution, fossil evidences of organic evolution.
(2) Position of Man in the Animal kingdom, comparative anatomy of Man and apes. Fossils Evidences of human evolution.

Unit: 3

(1) Concept of race, Genetic basis of race, UNESCO statement on race-Ethnic Group. Major races of the world, racial classification of human population.
(2) Basic concept of Human Genetics: Aims and scope of human genetics in Anthropology. Mendelian Principle, basic concept of DNA and RNA

Unit: 4

(1) Concept of Culture and society, aspects of Culture, Enculturation, Culture and Personality, Status and Role.
(2) Social Institution. Types of family and marriage, Nuclear, Extended, Joint, Monogamy and Polygamy, Endogamy and Exogamy, Patriarchy and Matriarchy, Definition and nature of Kinship: terminology, kin-groups — lineage, clan, phratry and Moiety.
(3) Religion and Magic: Theories of origin of religions: Animatisms, Manaism, Totemism. Type of Magic, Magic and Science.

Unit: 5

(1) Cultural and social change: Diffusion, Innovation, Acculturation, Cultural Lag, Planned change.
(2) Indian social system: Varnaashram, Purushasthas, Caste, Tribe, Definition, origin, characteristics difference between caste and tribe. Constitutional provisions for SC and ST, difference between SC and ST.

Unit: 6

Tribal population in India: Biogenic variabilities, linguistics and social-economic characteristics, geographical distribution of tribal population in India.

Unit: 7

Process of social change: Endogenous process - Sanskirtization, Parochiatization, Universalization, Great and Little tradition.
Exogenous process - Westernization, Industrialization and Urbanization, Globalization.

Unit: 8

(1) Science and Anthropology: Science and controlled experiments, concepts, theory and hypotheses: Types of hypothesis, testing hypothesis.
(2) Field work tradition in Anthropology: preparation, learning, language and rapport establishment.

Unit: 9

(1) Major tools of research: Observation, interview, key informants, case studies, schedules and questionnaires, genealogy.
(2) Use of Library, Review of literature and other records and reports.

Unit: 10

(1) Probability, sampling and scaling techniques.
(2) Statistical method: Man, median, mode, standard deviation, standard error and tests of significance.
(3) Data collection, analysis and report writing.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

ZOOLOGY

Full Marks: 200
Descriptive:100
Objective:100

Unit 1. Non-Chordate Zoology:

Principles of Classification, classification of Non-chordates up to classes with salient features, Study of Amoeba with reference to nutrition, locomotion and reproduction; Trypanosome with reference to parasitic mode of life; Leucocolenia with reference to canal system; structure and life cycle of earthworm, Coral reef formation; Taenia with reference to life cycle and parasitic adaptation. Ascaris with parasitic mode of life; life cycle of anopheles; life cycle of Pila; larval forms and affinities of Echinoderms.

Unit 2 Chordate Zoology:

General characteristics and classification of chordates and hemichordates up to sub classes with examples and salient features; Nutrition types-extra cellular and inn-cellular digestion, respiration-types and mechanism of respiration, Circulation and excretion-composition and function of blood, ABO blood group, structure and functions of Haemoglobin, structure and function of kidney and nitrogenous waste s movement; skeletal system(vertebrae, girdles and limbs) in amphibians, reptiles, ayes and mammals; integument and its derivatives: scales, feathers, skin, hairs, hoofs; Aortic arches; Lymphatic system, Portal system.

Unit 3 Cell biology and Immunology:

Physical properties and chemical composition of Prokaryotic and Eukaryotic cell, structure and functions of mitochondria, chloroplast, endoplasmic reticulum, ribosomes, golgi apparatus, lysosomes and centriole; concept of cell cycle, process and phases of mitosis and meiosis; Special types of chromosomes (Polythene and Lampbrush) and their significance; Immunology types: innate and acquired immunity, antigen, Anigen presenting cells(APC), antibody structure and functions.

Unit 4 Genetics:

Concept of genotype, phenotype, recessiveness, dominance, Mendel's experiment, method and laws, incomplete dominance, co-dominance, pleiotropism, allelism; linkage and crossing over, significance of crossing over, sex determination; General idea of Genetic disorders in man-Down's syndrome, Iclinfelter's syndrome, Turner's syndrome, Phenylketoneuria; gene mutation, mutation detected in Drosophila.

Unit 5 Evolution & Applied Zoology:

Origin of life, Paleontology, Geological time Scale, theories of evolution-Lamarckism, Neo-Lamarckism, Darwinism, Neo-Darwinistn, Synthetic theory of organic evolution, Natural selection, isolating mechanisms and speciation, adaptations-convergence and divergence; Applied zoology-basic concept and operational aspect of Sericulture, Apiculture, Lac-culture, Pisciculture and composite fish culture, elements of insect pest and pest control.

Unit 6 Biochemistry:

Classification and biological significance of carbohydrates, fats and proteins; glycolysis, giuconeogenesis, TCA cycle, I-IMP Pathway; Hydrolysis of proteins, transamination and deamination of proteins, omithine and uric acid formation; types of enzymes and mechanism of enzyme action; classification and importance of lipids, 13-oxidation of fatty acid, vitamins, amino acids.

Unit 7 Toxicology, Animal Behaviour & Biotechnique :

Introduction to toxicology, classiflcation of toxicants, xenobiotics, toxic agents and their mode of action, pesticides, metals, carcinogens, radiation, genobiotics, food additives; Animal communications, dance language of honey bee, definition and forms of learning behaviour, Social organization (bees & ants), territoriality, social hierarchy, altruism; Principles of Autoradiography, electrophoresis and chromatography, colorimetry, computer and computer aided techniques fur data presentation.

Unit 8 Developmental biology:

Introduction to developmental biology; structure of gametes, Gametogenesis, fertilization and parthenogenesis, types of eggs, types and patterns of cleavage, biastulation and gastrulation in chick, fate map construction in frog and chick, metamorphosis in frog, organogenesis with special reference to brain, eye and heart.

Unit 9 Ecology and Environmental biology:

Introduction to ecology and its sub-divisions (autcology & synecology), structure and functions of ecosystem, lotic and lentic ecosystem, energy flow in ecosystem, ecological niche, food chain, food web, ecological succession; Community structure, biotic communities; Population and its impact on eco-degradation; Environmental pollution, green house effect ozone layer depletion and its impact, acid rain, gaseous and mineral cycles-Nitrogen cycle. Sulphur cycle, Carbon cycle; Management and importance of wild life.

Unit 10 Endocrinology:

General characters of Hormones, Hypothalamic hormones and pituitary integration; Structure and functions of mammalian Pituitary, Thyroid, Parathyroid, Endocrine Pancreas, Adrenal, Testis, Ovary and Thymus gland; Insect endocrine glands. Physiology of reproduction, Pheromones and reproduction, Hormones in reproduction Pregnancy, Parturition and lactation.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

GEOLOGY

Full Marks:200

Descriptive Type: 100

Objective: 100

UNIT – I

General Geology

Origin of the earth; Age of the earth; Internal constitution of the earth; Continental drift and Plate tectonics; Earthquake; Volcanoes: Rock weathering and erosion; Geological action of wind, rivers and glaciers; Study of Geology – its importance and interest.

UNIT – 2

Crystallography and Mineralogy

External characteristics of crystal; Crystallographic notations; Crystal systems (Normal class).
Physical and optical properties of minerals; Silicate structures; Systematic classification, physical, chemical and optical properties of the following groups of minerals-

(a) Amphibole -tremolite and hornblende
(b) Feldspar -orthoclase, microline and plagioclase feldspars
(c) Pyroxene -hypersthene and augite.

UNIT – 3

Palaeontology

Process of fossilization and mode of preservation of fossil; Taxonomy and systematic nomenclature; Mechanism of evolution; Origin of life and its classification; Application of palaeontology in palaeoecology, evolution, stratigraphy and palaeogeographic reconstruction; Morphological, environment and geological distribution of Mollusca, Brachiopoda, Arthropoda and Corals.

UNIT – 4

Stratigraphy

Principals of Stratigraphy and correlation; Geological time scale; Lithostratigraphic, chronostratigraphic and biotratigraphic units; Methods of collecting stratigraphic data and identification of stratigraphic contacts and unconformities: Facies concept in stratigraphy; Palaeo-biographic provinces.
Indian stratigraphic column; Connotations of the terms Dravidian and Purana, Precambrian and Phanerozoic succession of India: Dharwar, Cuddapah, Vindhyan, Gondwana, Siwalik and Tertiary of the North-East.

UNIT - 5

Structural Geology and Tectonics

Definition and types of fold, fault, joint, cleavage, foliation, lineation and unconformities; Determination of top and bottom of layered rocks; Tectonic features of India with special reference to the North-East: Plate tectonics and recent advances; Tectonics of Pre-Cambrian organic belts of India; Structure and origin of the Alpine-Himalayan belt.

UNIT – 6

Igneous, Metamorphic and Sedimentary Petrology

Magma – definition, composition, origin and crystallization of uni-and bi-component magmas; Bowen's reaction series; Magmatic differentiation and assimilation; Phase Rule; Basic principles of equilibrium thermodynamics; Forms and mode of occurrence of igneous rocks; Textures and structures of igneous rocks and their classification; Phase equilibria in two and three component system; Albite - Anorthite, Forsterite - Silica and Diopside – Anorthite – Albite.

Metamorphism – types and agents; Textures and structures of metamorphic rocks:
Equilibrium reactions in metamorphic processes; Progressive and retrogressive metamorphic; Interpretation of paragenetic diagrams – ACF, AKF and AFM; Metamorphic facies with reference to mineral assemblages and P – T conditions.

Contd…

Origin of sediments; Sedimentary processes – weathering, transportation, deposition and diagenesis of terrigenous and chemical sediments; Genetic classification of sedimentary rocks; Texture and structure of sedimentary rocks; Sedimentary environments (marine, non-marine and mixed environments); Sedimentary facies: Classification of sandstones and limestones.

UNIT – 7
Economic Geology & Mineral Exploration

Definition of ore, gangue and tenor; Ore forming minerals – metallic and non-metallic; Processes of formation of ores – magmatic concentration, hydrothermal solution, skarns, sedimentation, metamorphism, evaporation, oxidation and supergene enrichment, metallogenic provinces and epochs.

Occurrence, origin, uses and distribution of the following economic mineral deposits in India – iron, gold, copper, manganese, chromium, aluminium, sillimanite and kyanite.

Geochemical methods of prospecting: Geophysical methods of prospecting; Surface and sub-surface methods of exploration of minerals; mining hazards.

UNIT – 8
Engineering Geology & Hydrogeology

Role of geology in engineering and sub–surface; Engineering properties of rocks; Geological considerations for evaluation of dams and reservoir sites; Influence of geological conditions on foundation and design of building.

Groundwater – importance, origin, occurrence, reservoirs and movement; Hydrologic properties of rocks; Salt water intrusion in coastal aquifers and remedial measures; Geological structures favoring groundwater occurrence; Methods of identification of groundwater reservoir properties.

UNIT -9
Remote Sensing

Principles of remote sensing; Types of sensors; Aerial photographs and satellite imageries; Interpretation of lithology (different rock types); Topographic and tectonic features of glacial, fluvial, coastal and Aeolian; Application of remote sensing technique in mapping, soil cover and surface water reserves; Principles and application of Geographic Information System(GIS), components, data presentation, vector and raster methods.

UNIT – 10
Environmental Geology

Concept and definition of Environmental Geology; Soil degradation and mitigation; Concepts of natural ecosystems on the earth and their mutual interrelations and interaction (atmosphere, hydrosphere, lithosphere and biosphere); Environmental problems – global warming caused by CO_2 increase in present atmosphere; Pollution due to mining industries, energy resources, urbanization; Environmental management and controls; Water-logging problems due to the indiscrete construction of canals, reservoirs and dams.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

COMMERCE
Full Marks: 200
Objective Type: 100
Descriptive Type: 100

Unit 1:
Generally Accepted Accounting Principles:
Accounting Concepts and Conventions; Accounting Standards.

Unit 2:
Financial Statement and Analysis:
Technique with special reference to Accounting Rations; Cash Flaw statement(AS-3)

Unit 3:
Issue, forfeiture and re-issue of forfeited shares:
Issue of Debenture; Redemption of preference shares. Preparation of Profit and Loss Accounts of General Insurance Companies and Life Insurance Companies(under schedule method).

Unit 4:
Sale of Goods Act, 1930: Formation of contracts sale:
unpaid seller and his rights: Definition of negotiable instruments – Dishonour and discharge of negotiable instrument; The consumer Protection Act 1986 – Salient Features, grievances redressed machinery.

Unit 5:
Entrepreneurial Development Programme:
their role, relevance and achievements, Role of Government in organizing EDPs, critical evaluation. Role of Entrepreneur in economic growth, social stability and balanced regional development of industries, export promotion and import substitution.

Unit 6:
Audit Process: Audit Programme and Audit Note Book:
Vouching; Verification of Assets; Special Audit – Audit of Educational Institutions, Hostels and Charitable)Organizations. Management Audit.

Unit 7:
Capital Budgeting: Nature of investment, decisions, investment evaluation criteria: Management of working capital – Nature and significance of working capital, operating cycle and factors determining the working capital requirement.

Unit 8:
Indian Business Environment:
Concept, components and importance; Role of Government – Monetary and fiscal policy, Industrial policy, EXIM Policy, privatization and regulation of foreign investment.

Unit 9:
Forms of business units:
Objectives and distinctive features of different forms of business organization – sole proprietorship, partnership, company, co-operatives and public enterprises.

Unit 10:
Nature of Management:
Meaning evolution and approaches, levels, principles of management.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

COMPUTER SCIENCE

Full Marks:200

Descriptive Type: 100

Objective: 100

Unit-I

Introduction to programming in C++

C++ character set, C++ tokens (identifier, keyboards, constants, operators). Structure of C++ programme (include files, declaration of an object, main function); header files, iostream.h, iomanip, cout, cin. Use of I/O operators (<< and >>, use of setw() and endl, cascading of I/O operators, error message; use of editor, basic commands of editor, compilation, linking and executive.

Data Types, variables and constant:

Concept of data types; built-in data types; void, char, int, float and double; constant; integer constants, character constant(backslash character constant; \n, \a, \r, \t), floating point constants, string constants; variables of built-in data types, access modifier; const; type modifiers, signed, unsigned, short long;

Operators and expression:

Operators: arithmetic operators(-,+,*,/,%), unary operator(-), increment and decrement operators(--,++), relational operators(>,>=,<,<=,==,!=), logical operators (&&,|| ,!) conditional operator ?:(Condition? If statements: else statements), precedence of operators; expressions: automatic type of conversion in expressions, C++ shorthand's (+=,- =,*=,/=,%=); assignment statement; variable initializations; type compatibility, type casting.

Flow control:

Conditional statements: if-else statement, if-else-if ladder, nested if, switch case, nested switch, default statement, break statement: simple control statement, comma operator, exit() function; loops while statement, for statement, nested control statement.

Unit-II

Structured data type: array

Use of arrays ane and two dimensional arrays- declaration, initialization, reading, display, manipulation such as linear search, finding maximum/minimum value, matrix arithmetic;

String: string manipulations such as reversing each word of a string, counting vowels, consonants, special characters from string.

Built-in functions

Header files: string.h, ctype.h, math.h, stdlib.h, stdio.h

Standard functions: character and string related functions: isalnum(),isalpha(), isdigit(), insuper (), tolower(), toupper(), strcpy(), strcat(), strlen(), stremp(), strempi(), atpi(), atol(), ltoa().

Mathematical functions:

abs(), sqrt(), exp(), log10(), frexp(), sin(), cos()

Input Output functions: getc(), putc(), gets() and puts() functions.

Functions:

Defining a functions, function prototype, invoking a function, passing arguments to function ,specifying argument data types, default arguments, constant arguments, call by value, call by reference; returning values from a function, calling function with arrays; scope rules of function and variables.

Unit – III

Structures:

Defining a structure, creating a structure Variable , referencing structure Elements, array of structure, passing structure to functions, functions returning structure, user-defined data types: use of typedef enumerated data types: definition, declaration, changing default ordinal values, symbolic constant, nested structure.

Unit – IV

Classes and objects:

Class declaration: data members, member functions, private and public members, default labels, data hiding and encapsulation, arrays within a class, class function definition: member function definition inside the class declaration and outside the class declaration, scope resolution operator(::), private and public member function, nesting of member functions, creating objects, accessing class data members, accessing member functions, arrays of objects, objects as function arguments: pass by value and reference.

Unit-V

Digital Logic, Circuits, Digital Components and number system

Combinational Circuits (Half-Adder, Full-Adder, Binary Parallel Adder, BCD Adder, Universal Property of NAND and NOR gates, Combinational Circuits Using NAND and NOR gates); **Flip** flops (SR, D JK, T, Master Slave, Edge-Triggered, Excitation Tables);Integrated Circuits (Digital Logic Families and Integrated Circuits); Decoders (NAND Gate Decoder, Decoder Expansion, Encoders); Multiplexes (4 to1 Line Multiplexer); Demultiplexer; Registers (Register with Parallel Load); Shift Registers (Bidirectional Shift Registers with Parallel Load, Serial Register); Binary Counters (Binary Counter with Parallel Load, Ripple Counter).

Number system: binary, octal, decimal, hexadecimal number systems, number system conversions, Binary representation of integers: sign and magnitude representation one's complement representation and two's complement representation; binary representation of real numbers.

Contd…

Unit-VI:

Register Transfers, Microoperations, Basic Computer Organization & Design

Register Transfer; Control Functions; Bus and Memory Transfers (Three-State Bus Buffers, Memory Transfer); Arithmetic Microoperations (Binary Adder-Substractor, Arithmetic Circuit); Logic Microoperations (List of Logic Microoperations, Hardware Implementation, Some Applications (viz. Selective- Set, Selective-Complement, Selective-Clear, Mask, Insert, Clear Operations); Shift Microoperations 9Hardware Implementation); Arithmetic Logic Shift Unit (Function Table for Arithmetic Logic Shift Unit)

Instruction Codes (Stored Program Organization, Indirect Address); Computer Register; Common Bus System; Computer Instructions (Instruction Set Complements); Timing and Control (Clock Pulses, Hardwired Control, Microprogrammed Control, Control Unit, Timing Signals); Instruction Cycle (Fetch and Decode, Determine the Type of Instruction, Register-Reference Instructions); Memory-Reference Instructions (AND to AC, ADD to AC, LDA; Load to AC, STA: Store AC, BUN: Branch Unconditionally, BSA: Branch and Save Return Address, ISZ: Increment and Skip If Zero, Control Flowchart); Input-Output and Interrupt(Input-Output Configuration, Input-Output Instructions, Program Interrupt, Interrupt Cycle); Computer Description (Flowchart for Basic Computer); Design of Basic Computer (Control of Logic Gates, Control of Registers and Memory, Control of Single Flip-Flops, Control of Common Bus); Design of Accumulator Logic (Control of AC Register and Logic Circuit)

Unit-VII

Introduction to database system concepts and architecture

Introduction to database, characteristics of the database approach, advantages of using a DBMS, implications of the database approach.

Data models, schemas. Instances, DBMS architecture, Data Independence, Database languages and interfaces, database system environment, classification management system..

Data modeling using the entity-relational model

High level conceptual model for database design, entity types, entity sets, attributes and keys, relationships, relationship types, roles and structural constraints, weak entity types, ER diagrams, naming conventions and design issues.

Unit-VIII

Relational model concepts, relational constraints and relational database schemas, update operations and dealing with constraint violations, basic relational algebra operations additional relation operations, examples of queries in relational algebra.

Data definition, constraints and schema changes in SQL2, basic queries in SQL, More complex SQL queries, insert, delete and update statements in SQL, views in SQL, specifying general constraint as assertion, addition features of SQL.

Unit-IX

Overview, Environment and Programming

Overview: Visual Basic Application Types, Visual Basic, Application Components Projects, Forms, Controls, Code modules, Class modules, User controls, Property pages)

VB Environment: Menu Bar, Toolbar, Toolbox, Form, Project explorer, Property window, Immediate window, Form layout window. Creating a project, Forms, Naming a project, Saving a project.

Controls: Label control, TextBox control, Command Button, Frames, Option Buttons, Check Boxes, Picture control, Image Control, Shape control, Line control, Timer control, H scrollBar control, V scrollBar control, FileListBox control, DirListBox, DriveListBox control.

List and Menus: List Box control, Combo Box control. Menu System(Menu standards, menu editor, common menu properties).

Events: Code window, Breakdown of an event procedure, form events, label events, texttbox events, command button events, frame events, option button events, checkbox events, picture control events, image control events, listbox events, combobox events, menu events.

Variables: Data types, Declaring variables, scope and lifetime of a variable, Examples of variables, Variant data types.

Arrays Types and Constants: Arrays(Fixed size, Dynamic, Preserving array contents), Setting array boundaries, Array() functions, is Array() functions, Bounds checking, Clearing an array. Multidimensional arrays, User-defined types, Constants (Local constants, Public Constants, Module-level, Built-in), Mathematical and Relational operators, Control Arrays.

Unit-X

More on Programming and Error Handling

Conditional Logic and Looping: If…Then…Case, Do…While, While…Wend, Loop…While, Do…Until, Loop…Unit, For…Next, Nested constructs, Exit For/Exit Do, Exit Sub/ Exit Functions.

Procedures and Functions: Procedures, Functions, Parameters and Arguments, Call by Value and Call by Reference, Optional Arguments, Named Arguments.

Built-in Functions: String Functions, Date Functions, Conversion Functions, Functions to test Data Types, Methods.

DialogBoxes: MsgBox, InputBox, Common Dialof Control.

Multiple Document Interface: What is MDI, Creating and MD Form, Child menus in MDI applications, Arrangement child forms, Tracking Child Windows, Unloading an MDI application.

Error Handling: Error handling techniques, On Error GoTo, Err object (Err. Number, Err. Description), On error Resume Next, Errors in Call Stack, Turning Error handling Off, Creating a Global error handler.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

MATHEMATICS

Full Marks:200

Descriptive Type: 100

Objective: 100

1. Algebra I: Theory of matrices, Binomial Theorem (series), Exponential and logarithmic series. Continued Fractions. Theory of equations. Roots of Polynomial Equations. Irrational Roots and Complex roots, Relation between the roots and the coefficients. Symmetric functions of roots. Transformation of Equations. Higher Trigonometry. Expansions of sin $n\theta$, and cos $n\theta$, $\sin^n\theta$, $\cos^n\theta$. Power series expansion of sin θ . Power series expansion of sin θ , cos θ, Trigonometric and hyperbolic function with complex argument. Logarithms of complex numbers. Sequences Definition (Arithmetic, Geometric and Harmonic sequences), general theory of convergence of sequences and counter examples. Series , definition, convergence and tests for convergence (Internal test, p-series, comparison series, ratio test. Alternating series, Absolute and Conditional Convergence, Power series.
2. Abstract Algebra: Definition: sets, relation, functions (mappings). Equivalence relations. Groups, Subgroups and related topics and problems. 9Statement of theorems only). More emphasis on problems. Homomorphisms, Automorphisms. Statement of theorems and problems. Sylow's theorems (statement only) and problems. Rings, ideal (maximal, prime), examples Internal Domain, Fields (definitions) and Theorems (statement only) and problems. Vector Space theory, Problems on finding basis, Theory of linear Transformation. Characteristic roots and vectors, and diagonalization.
3. Complex Analysis: Definition of complex numbers and algebra of complex numbers. Properties of Modulus and amplitude, polar form of a complex number, Euler's formula and Demoivre's theorem (statement only) problems. Analytic functions, Cauchy Riemann equations, Harmonic functions (definition) and problems. Complex integration, Cauchy integral Theorem. Expansion of functions in power series (Taylor, Laurent). Circle of convergence, radius of convergence. Singular points Evaluation of integrals. Poles and zeros. Theory of residues. Contour integration and evaluation of some Real integrals.
4. Differential Calculus: Function and Limits. Differentiation, successive differentiation. Meaning of derivative, Maxima, Minima, Roll's Theorem, Mean Value of Theorem, Tangent, Normal, Envelopes, Curvature of plane curves, Asymptotes (Vertical and Horizontal). Linear approximation and Differentials. L'Hospital's Rule.
5. Integral Calculus and differential equations: Anti differentiation, Techniques of integration. Areas as the limit of a sum, the mean value of theorem for integrals, Average values, area between two curves, volume, polar forms and Area, are length and surface area. Physical application like work, centroids. Application to business, economics and life sciences, Improper integrals.
   Differential Equations: Order and degree. Formation of differential equation. Solutions for variable separable, homogeneous, linear of first order. Exact differential equation. Solutions of equations of first order higher degree (solvable for p, x, y) singular solutions. Solutions of equations of the form f(D)y=g(x), Finding complimentary function and particular integral, where D= $\frac{d}{dx}$
6. Functions of several variables. Limits and Continuity, (problems and counter examples) partial Derivatives, Tangent planes, Approximations and differentiability, chaien Rules, Directional derivatives and the Gradient. Extrema of functions of two variables. Double integration, triple integration, change of order of integration. Cylinderical and Spherical coordinates.
7. Vector Algebra and Vector Analysis: Coordinates and vectors in R^3, the dot product, the cross product, triple product, application to geometry, physics.
   Introduction to vector functions, Differentiations and integration of Vector functions, properties of vector field. Divergence and Curl. Line integrals. The Fundamental Theorem and path independence. Problems an Green Theorem, Stokes theorem, Surface integrals, Divergence Theorem.
8. Analytical Geometry 2D and 3D. Lines, circles, conics in planes. Line, plane, sphere, cone and cylinder on space.
9. Mechanics: Statics. Force. Resultant and resolution of forces, Equilibrium of a system of forces. (Simple problems based on Lami's Theorem). Parallel forces. Moments and couples. Work done by a force.
   Dynamics. Displacement of a particle, velocity, acceleration and related concepts. Motion in a straight line, vertical motion. Equations of motions. Motion with constant acceleration.
10. Laplace transform. Definition and L.T of some standard functions. Basic properties of L.T. L.T of periodic functions. L.T of derivatives. The inverse transforms.Fourier Series. Fourier series of a function Fourier series for even and odd functions. Half range series.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

LIBRARY SCIENCE

Full Marks: 200
Descriptive:100
Objective:100

Unit: I: Laws of Library Science
Ranganathan's Five laws of Library Science are a set of norms. precepts and guides to good practices in librarianship. These Laws are also valid guides to practices in the wider area of documentation and information systems and services. After reading this unit. you will he able to: explain your activity in library, documentation and information work and services in tune with these guiding principles governed by the Five Laws; and make use of the Five Laws a set of logical principles to initiate any new activity in library, documentation information work and services.

Unit: II: Circulation work
Lending documents for home reading is a normal. regular and on-going activity of most modern service libraries. When hundreds and thousands of documents are on circulation among readers it is necessary to design a system to operate and control the movements of documents in a library. The work of circulation has therefore, to he planned and managed with efficiency. This unit discusses all these aspects. After reading this unit you will be able to identity the factors with reference to which circulation work can be planned; design a circulation system suitable for a library: describe policy guidelines with reference to all aspects of circulation work: and organize and manage the various functions of circulation work.

Unit: III: Fundamental categories, Facet Analysis and Facet Sequence
This unit explains the importance of terminology for a scientific subject like classification. It also familiarizes you with the fundamental concepts/terms associated with the discipline of classification.

Unit: IV: Kinds of entries
You have learnt about a library catalogue, the purpose of it serves and the functions it performs. The preparation of various types of entries constitutes the basic &work of cataloguing. This unit introduces you to the different types of entries and their relative functions. After reading this unit you will be able to describe a catalogue entry; explain the need for different kinds of entries; distinguish their functional characteristics:and identity the composition of entries in a dictionary and a classified catalogue.

Unit: V: Indexing and abstracting periodicals
In this unit we discuss indexing and abstracting periodicals as information access tools. After reading this unit you will be able to: define indexing and abstracting periodicals: describe their scope and utility; enumerate different types of indexing and abstracting periodicals with examples; and explain the importance and uses of indexing and abstracting periodicals.

UNIT: VI: Current Awareness periodicals
In this unit we introduce you to two important information services offered by libraries and information centers: Current Awareness Services and Selective
Dissemination of Information service. After reading this unit you will be able to: explain the need and purpose of current awareness services (CAS); describe the different types of CAS explain the concept and objectives of Selective Dissemination of Information (SDI)service; list the components of SDI and describe them: and explain the functional aspects of SDI.

Unit: VII: Library and Information Networks
In this unit let us try to understand the concept of not works especially library and information networks. What they are how they function and their role in the provision of information service to the users has also in the resource sharing activities. After reading this unit you will be able to: understand the concept of computer networking in all its major forms; explain the role of networking in the public domain; know the meaning of library and bibliographic networking; the role of networking in resource sharing the information services; and explain some of the current developments in networking taking place in the developed countries of the world.

Unit: VIII: Human Resource Development
Human resource development concept and contours; Personal planning; participative management and total quality management.

Unit: IX: Approaches to library classification
Postulation and systems approaches; Fundamental categories, facet an alysis and facet sequence; Phase relation and common isolates.

Unit: X: Dewey decimal classification (DDC); universal decimal classification (UDC); Colon classification (CC); Current trends in library classification.

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

STATISTICS

Full Marks:200

Descriptive Type: 100

Objective: 100

Unit- 1: Descriptive Statistics

Brief resume of presentation of data: Measures of central tendency and dispersion: Moments, Skewness and Kurtosis: Principles of least squares: Correlation. Regression and Spearmen's Rank correlation coefficient: Theory of attributes: Multiple and Partial correlation(involving three variables only).

Unit- 2: Probability Theory

Random experiments, sample points, sample space, events etc: Definitions of probability and related problems: Theorems of total compound and conditional probability: Baye's theorem: Discrete and continuous random variables: Probability mass function(pmf), probability density function(pdf), marginal and conditional distribution functions: Mathematical expectations – Addition and multiplication theorem of expectations, conditional expectation and variance.

Unit- 3: Probability Distributions

Probability generating, moment generating and cumulant generating functions: Markov's and Chebysheff's Inequality, central limit theorem. Weak and Strong law of large numbers: Standard distributions – Bernoulli, Binomial, Poisson, Geometric and Hyper-geometric distributions: Normal, Cauchy, Exponential, beta and Gamma distributions: Bivariate normal distributions and its properties.

Unit- 4: Numerical Analysis

Δ, ∇ and E operators – their interrelationships and problems related to them: Interpolation and extrapolation meanings and assumptions: Newton's forward, backward and divided difference formulae, Lagrange's interpolation formula, Inverse interpolation, Central difference formula due to Gauss. Bessel and Stirling's; Trapezoidal, Simpson's and Weddle's rules of numerical integration with illustration: Solutions of ordinary differential equations and solution of algebraic equation by Newton-Raphson's method.

Unit- 5: Sampling Distributions

Random sample, parameter and statistic; Sampling distribution of a statistic, standard errors of sample mean, sample proportion and moments; Sampling distribution of sample mean and variance for normal population; Sampling distributions of χ^2(chi-square). T and F –statistic and their properties and applications; Test of significance based on χ^2, t and F statistics; Large sample test for proportions. Fisher's Z-test for correlation coefficient.

Unit- 6: Statistical Inference

Estimate and estimators; Problems of point and interval estimation; Criterion of a good estimator- Unbiasedness, consistency, efficiency and sufficiency with simple illustration; Problems of unbiased estimators related to standard distributions; Concepts of statistical hypothesis. Null and Alternative hypothesis; Simple and composite hypothesis; Type-I and Type-II errors; Critical region, one and two tailed tests, level of significance and power of a test; Most powerful(MP) and Uniformly MP test with illustrations(binomial, Poisson, normal_. Confidence interval and confidence limits; Maximum likelihood(ML) estimation and its properties.

Unit- 7: Sample Survey

Concepts of population, sample, census and sample survey-their advantages and disadvantages; Need for sampling, Pilot survey, sources of sampling and non-sampling errors; Different types of sampling; Simple random sampling(WR and WOR), stratified random sampling and Systematic sampling – their unbiased estimate of mean; Sampling for proportion: Proportional, Neyman and Optimum allocations; Cluster sampling, Double sampling and Multiphase sampling; Ratio and Regression method estimation under SRS, their biases and mean square error.

Unit- 8: Analysis of Variance(AoV) and Design of Experiment (DoE)

Analysis of variance technique and basic assumptions; Analysis of variance of one-way and two-way classifications; Basic principles of Design of Experiments(DoE): CRD, RBD and LSD-their analysis and advantages and disadvantages; Factorial Experiments- its advantages over single factor experiments; Confounding in Does(2^n, n=2,2,2&5); Missing plot technique in RBD and LSD.

Unit- 9: Index Number, Time Series, Statistical Quality Control (SQC) & Demography

Index number- its definition, construction and applications; Price and Quantity index numbers; Simple aggregate and weighted average methods; Laspayre's, Paache's and Fisher's index numbers; Time and Factor reversal tests; Cost of living index number-construction and uses: Time series and its components; Additive and multiplicative models; Determination of trend, growth curves and seasonal variation; Demography-meaning and scope; Sources of demographic data; Different types of mortality and fertility rates; Gross and Net reproduction rates; Complete life table-its main features, mortality, probability of dying and life expectancy of birth; Cocepts and importance of SQC; Assignable and Chance causes of variations; Control charts for variables and attributes; Mean ($\bar{\chi}$), Range(R), p and c-charts.

Unit- 10: Economic Statistics and Computer Application

Laws of demand and supply; Price elasticity of demand; Analysis of income distribution; Pareto law and distribution; Engel's curve, Lorenz curve; Estimation of elasticity from time series data. History and development of computer; Computer system, different components and their functions; Number systems-decimal, binary and octal etc. Conversion from one number system to another. Programming languages – Machine language, assembly language and high level language; Algorithm and Flowcharts; Elements of BASIC programming language; Basic statements-REM, IN-PUT, READ-DATA, PRINT, DO, GO etc. (Simple programme using these statements- Calculation of mean, variance, construction of frequency distribution table, correlation coefficient).

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

HINDI

पूर्णांक : 200 निबंधात्मक प्रश्न : 100 वस्तुनिष्ठ प्रश्न : 100

खण्ड (क)

पद्य (कविता) Poetry

1. साकेत : मैथली शरण गुप्त
2. कुरुक्षेत्र : रामधारी सिंह दिनकर
3. अंधेरे में : गजानंद माधव मुक्तिवोध
4. भारत माता : सुमित्रानंद पंत
5. संसद से सड़क तक : सुदामा पाण्डे धूमिल
6. निशा निमंत्रण : हरिवंश राय बच्चन
7. कबीर-बाणी : कबीर

खण्ड (ख)

गद्य (Prose)

इकाई (Unit) I - उपन्यास (Novel)

1. उपन्यास के स्वरूप और विकास :
2. गोदान : प्रेमचंद
3. राग दरबारी : श्री लाल शुक्ल
4. झूठा सच : यशपाल
5. मैला आंचल : फणीश्वर नाथ रेणु
6. धरती धन न अपना : जगदीशचन्द्र

इकाई (Unit) II – नाटक (Drama & one act play) और एकांकी

1. बहुत बड़ा सबाल : माहन राकेश (एकांकी)
2. औरत : सफदर हाशमी (एकांकी)
3. अंधेर नगरी : भारतेंदु हरिश्चंद्र
4. रजनी : मन्नु भंडारी
5. चंद्रगुप्त : जयशंकर प्रसाद

इकाई (Unit) III – कहानी (Story)

1. पूस की रात/ भाड़े का टट्टू : प्रेम चंद
2. भेड़ और भेड़िया/भोलाराम का जीव : हरिशंकर परसाई
3. त्रिशंकु/काले मेघ पानी दे : मन्नु भंडारी
4. चिफ की दावत : भीष्म साहनी
5. जामुन का पेड़ : कृष्ण चंदर
6. भक्तिन : महादेवी वर्मा

इकाई (Unit) IV – निबंध (Essay)

1. कूटज : हजारी प्रसाद द्विवेदी
2. बाजार दर्शन : जैनेन्द्र कुमार
3. उत्साह : आचार्य रामचन्द्र शुक्ल

इकाई (Unit) V – हिंदी भाषा की उत्पत्ति, विकास और हिंदी साहित्य का इतिहास

1. आदिकाल : प्रमुख कवि और उनकी रचनाएँ
2. भक्तिकाल : प्रमुख कवि और उनकी रचनाएँ
3. रीतिकाल : प्रमुख कवि और उनकी रचनाएँ
4. आधुनिक काल : भारतेंदु युग, द्विवेदी युग, शुक्ल युग, छायावाद, प्रगतीवाद

खण्ड (ग)

भाष विज्ञान और हिंदी भाषा

इकाई (Unit) I – हिंदी व्याकरण (Grammar)

1. शब्द, संज्ञा, सर्वनाम, लिंग, वचन,, विशेषण, क्रिया-विशेषण, प्रेरणार्थक क्रिया, काल आदि ।
2. उपसर्ग, और प्रत्यय, कारक, विलोम शब्द
3. संधि और समास
4. मुहावरे और लोकोक्तियाँ
5. शब्द भेद, रस, छंद एवं अलंकार तथा उनका महत्व

इकाई (Unit) II – संरचना (Composition)

1. संक्षेपण (सार लेखन), पत्र लेखन, पल्लवन, अपठित लेखन, निबंध लेखन

इकाई (Unit) III – अनुवाद एवं कार्यालयी हिंदी (Translation and official Hindi)

1. अनुवाद : हिंदी - अंग्रेजी - हिंदी एवं भाषण लेखन
2. कार्यालयी हिंदी : विज्ञप्ति, शिकायती पत्र आदि

इकाई (Unit) IV – सामान्य ज्ञान (General knowledge)

1. शिक्षा संबंधी (केंद्रीय, प्रांतीय एवं राज्य स्तर) समसामयिक विषयों पर
2. स्थान संबंधी (केंद्रीय, प्रांतीय एवं राज्य स्तर पर सामान्य ज्ञान)
3. साहित्य संबंधी

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES EXAMINATION

MANAGEMENT

(Units 1-10)

Full Marks : 200
Descriptive Type : 100
Objective : 100

Unit 1 **Organization Behaviour & Management Concepts.**

Managerial Function: Concept and foundations of management, Managerial role and functions. Study, Analysis of Environmental opportunities and threats, Formation of Organizational Vision, Mission and Objectives. Decision Making.

Unit 2 **Schools of Management thoughts; Organizational Behaivour**

Significance of social, psychological factors for understanding organizational behavior/Relevance of theories of motivation, Contribution of Maslow, Herzberg, McGregor, McClelland and other leading authorities/ Research studies in leadership/ Management by Objectives/ Small group and intergroup behavior/ Application of these concepts for understanding the managerial role, conflict and co-operation, work norms and dynamics of organizational behavior/Organizational change.

Organizational Design: Classical neoclassical and open systems, theories of organization/ Centralization, decentralization, delegation, authority and control/ Organizational structure, Systems and processes, strategies, policies and objectives/ Decision making, communication and control/ Management information system and role of computer in management.

Unit 3 **Economic Environment.**

National Income, analysis and its in business forecasting/ Trends and structure in Indian Economy, Government programmes and policies/ Regulatory policies: monetary, fiscal and planning and the impact of such macro policies and enterprise decisions and plans/ demand analysis and forecasting cost analysis, pricing decisions under different market structure pricing of joint products and price discrimination.

Unit 4 **Quantitative Methods.**

Classification Optimization maxima and minima of single and several variables: Optimization under constraints- Application. Linear programming: problem formaulation-Graphical solution-simplex Method Duality-post optimality analysis-Application of integral programming and dynamic programming-formulation of Transportation and assignments. Models of linear programming and methods of solutions.

Statistical Methods: Measures of Central tendencies and variations-Application of Binomial. Poisson and Normal Distributions. Time series Regression and correlation-Tests of Hypotheses-Decision making under risk: Decision Trees-Expected Monetary Value-value of Information-Application of Baye's Theorem to posterior analysis Decision making uncertainty. Different criterion for selecting optimum strategies.

Unit 5 **Marketing Management.**

Concept of marketing mix-market segmentation Product differentiation strategies-Consumer Motivation and 28ehavior, Segmentation, targeting and positioning, Brand, distribution; Public distribution system, price and promotion.

Decision-Planning and control of marketing programmes-Marketing research and Models-Sales organizational dynamics-Marketing Information system.

Export incentives and promotional strategies-Role of Government, trade association and Individual organization-problems and prospects export marketing.

Unit 6 **Production and Materials Management.**

Fundamentals of production from Management point of view. Types of manufacturing systems. Continuous repetitive, intermittent. Organizing for production. Long range forecast and aggregate production planning.

Plant Design: Process planning plant size and scale of operations, location of plant, layout of physical facilities. Equipment replacement and maintenance.

Functions of Production Planning and control-Routing. Loading and scheduling for different types of production systems. Assembly line, Balancing, Machine Line Balancing.

Role and importance of materials management, materials handling, value analysis, Quality Control, Waste and Scrap disposal, Make or Buy decision Codification, Standardization and spare parts inventory. Inventory control-ABC. Analysis Economic order quantity, Recorder point. Safety stock. Two Bin systems.

Unit 7 **Financial Management.**

General tools of Financial Analysis: Ratio and analysis, funds flow analysis, cost-volume profit analysis, cash budgeting, financial and operating leverage.

Investment Decision: Steps in capital expenditure management, criteria for investment appraisal, cost of capital and its application in public and private sectors, Risk and analysis in investment decisions, organizational evaluation of capital expenditure management with special reference to India.

Financing decisions: Estimating the firms of financial requirements, financial structure determinations, capital budgeting decision, capital markets, and institutional mechanism for funds, with special reference to India, security analysis, leasing and sub-contracting.

Working capital Management: Determining the size of working capital, managing the managerial attitude towards risk in working capital, management of cash, inventory and accounts receivables, effects of inflation on working capital management.

Income Determination and Distribution: Internal financing, determination of dividend policy, implication of inflationary tendencies in determining the dividend policy, valuation and dividend policy.

Financial management in public sector with special reference to India. Performance budgeting and principles of financial accounting Systems of management control.

Unit 8 **Human Resource Management.**

Characteristic and significance of Human resources, Personal Policies-Man-Power and Planning Recruitment and Selection technique-Training and Development; Promotions and performance appraisal-job evaluation; Wage and Salary Administration; Employee Morals and motivation; Conflicts Management, management of change and development. Management of organizational climate and Industrial Relations

Unit 9 **Strategic Management**

Concept- Strategic planning and decision making; Strategy implementation; Financial strategies.

Unit 10 **Globalization**

Issues in globalization-mergers, acquisition, offshore and business operations.

****E****N***D****

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

PUBLIC ADMINISTRATION

Full Marks: 200
Descriptive Type: 100
Objective Type: 100

Unit I **INTRODUCTION**

Meaning, scope and significance of Public Administration. Wilson's Vision of Public Administration; Evolution of the discipline and its present status; New Public Administration; Public choice approach; Challenges of Liberalisation, Privatisation, Globalisation; Good Governance; Concept and application; New Public Management.

Unit II **ADMINISTRATIVE THOUGHT**

Scientific management and Scientific management movement; Classical Theory; Weber's Bureaucratic Model- its critics and post Weberian developments; Dynamic Administration.

Unit III **ORGANISATIONS**

Theories- systems, contingency, structure and forms: Ministries and Department, Corporations, Companies and Commissions; Head Quarters and Field relationships; Authorities; Public-Private Relationships.

Unit IV **ACCOUNTABILITY AND CONTROL**

Concepts and control; Legislative, Executive and Judicial Control over Administration and Citizen; Role of Media, interest groups, Voluntary organizations, Civil Society; Right to Information.

Unit V **DEVELOPMENT AND DYNAMICS**

Concept of development; changing profile of development administration; Bureaucracy and development; Impact of Liberalisation on administration in developing countries.

Unit VI **FINANCIAL INSTITUTIONS**

Monetary and Fiscal policies; Public Borrowing and Public debt budgets- Types and forms; Budgetary process; Financial accountability; account and audits.

LEGACY, PHILOSOPHICAL AND CONSTITUTIONAL FRAMEWORK IN INDIA

Unit VII Legacy of British Rule in Politics and administration in India. Bureaucracy and Democracy, Bureaucracy and Development in India.

Unit VIII Public Sector in modern India and impact of Liberalisation and Privatisation.
Role, composition function of the Planning Commission and National Development Council.

Unit IX Union-State Administration, Legislative and Financial relations. Role of Finance Commission.

Unit X Significant issues in Indian Administration; Values in Public Service; Regulatory Commission, National Human Rights Commission, Problem of Administration in Coalition Politics (regimes); Corruption and Administration, Disaster Management, Criminalisation of Politics and Administration, Police-Public relations and reforms in Police (74^{th} Constitutional Amendment).

**********END**********

SYLLABUS FOR COMMON EDUCATIONAL SERVICES
FUNCTIONAL ENGLISH

Full Marks: 200
Descriptive: 100
Objective : 100

UNIT I: PHONETICS AND SPOKEN ENGLISH

(a) Describing English segments- Consonants, Vowels and Diphthongs.
(b) Allophonic variants
(c) Phonetic Transcription of the English Language
(d) Identifying the intonation patterns of spoken English and its characteristic rhythm.
(e) Placement of stress in English.
(f) Detailed analysis of the English syllable and its structure.

UNIT II: METHODS AND APPROACHES OF TEACHING ENGLISH

(a) Approaches to Language Teaching.
(b) Perspectives of the Classroom, the Teacher and the Learner.
(c) Effective pedagogy: Principles of Learning and Teaching.
(d) Use of Technology in Second Language Teaching and Learning.
(e) Fundamental Principles of Testing.

UNIT III: FUNDAMENTALS OF ENGLISH LINGUISTICS

(a) English Phonology and Morphology
(b) Syntax and Semantics
(c) Application of Linguistics to language teaching

UNIT IV: MATERIALS FOR THE TEACHING OF ENGLISH

(a) Role of materials in the Learning activity of Language Classrooms.
(b) How to choose, adapt and analyze materials for developing and testing the language skills-listening, speaking, reading and writing.

UNIT V: GRAMMAR IN LANGUAGE LEARNING AND LANGUAGE TEACHING

(a) Verbal element of a sentence.
(b) Detailed analysis of the tenses of English in terms of form, function, and meaning.
(c) Interrelated character of Grammar, phonology and meaning.
(d) Sentence as a unit of grammatical analysis.

UNIT VI: LANGUAGE AND SOCIETY

(a) Linguistic competence and communication competence.
(b) Speech community, Speech act, speech event, speech repertoire.
(c) Variety, Dialect, Register.
(d) Language variety, Native, Non-Native Regional, Social, Standard, Non-Standard elaborate and restricted.

UNIT VII: ORAL COMMUNICATION

(a) Conversational English: conversation/oral communication(in formal & informal occasions-Nature, role, characteristics, techniques, procedures and decorum)
(b) Essential Elements of Public Speaking: Group Dynamics and Meetings, Seminars & Symposia, Teaching & Speech Presentation, Hosting and attending (Important, nature, role, characteristics, techniques, procedures, elements and decorum)

UNIT VIII: STYLE AND VARIETIES OF ENGLISH

(a) British, American and Indian English in terms of Pronunciation, usage and grammar.
(b) Standard English (as opposed to non standard variety e.g. slang, cockney etc.

UNIT IX: MASS COMMUNICATION AND BRAODCASTING

(a) Introduction to Mass communication: Importance, Role,nature and essential elements.
(b) News casting on TV: Importance, role, requisite traits and qualities of a Newscaster.
(c) T.V programme presentation: Anchoring, Interviews & Interviewing, Talk Shows: Importance, role, techniques, procedure & requisite traits/personality.
(d) Radio programme presentation: News reading, Radio talk, Radio drama, Disc jockey: Role, importance, requisite traits and essential elements

UNIT X: ENGLISH FOR WRITING PURPOSES

(a) Forms of writing-Formal, Informal, Literary and Non-Literary.
(b) Creative Writing & Feature Writing
(c) News writing- Difference between Newspaper and Radio & TV with reference to Language.
(d) Advertisement: Banners, posters, pamphlets. hoardings. invitations, captions etc.

END

SYLLABUS FOR COMBINED EDUCATIONAL SERVICES

LINGUISTICS

(Units I-X)

Full Marks: 200
Descriptive:100
Objective:100

Unit I: Introduction to Linguistics

a. Language and Communication: definition of language, verbal and non-verbal communication; human and non-human communication; Language and Society; Medium of language; Written and Spoken
b. Language structure: The concept of linguistic sign; synchronic and diachronic approaches; syntagmatic and paradigmatic relation; language and parole
c. Linguistic analysis: Basic concepts in phonetics, phonology and morphology; morphology; morphemic processes; grammatical categories.
d. Classification of Languages: Genetic, typological and areal; Linguistic typology: Language and dialects, standard and vernacular languages.

Unit II: Phonetics

a. Study of Speech: Articulatory, auditory and acoustic aspects; Anatomy and physiology and speech production; Airstream process, articulation process, oral and nasal process.
b. Classification of sounds; Place and manner of articulation
c. Complex articulation; segmental articulation Co-articulation: Double articulation, secondary articulation, palatalization, pharyngalization etc.
d. Phonetic transcription (IPA)

Unit III: PHONOLOGY

a. Relation between phonetics and phonology; phonological reality of units and boundaries; biuniqueness, neutralization and free variation; contrast and complementary distribution.
b. Syllable: Structure of syllable and syllable types, suprasegmental features.

Unit IV: Morphology

a. Basic concepts in Morphology
b. Compounds: type of compounds; formal vs. sematic classification; dvandva, bahuvrihi etc rules of compound formation.
c. Word formation: Types of word formation
d. Morphological alternation: Phonological changes, backformation; concatenation; cliticization; regular and irregular alternation; typological classification of language based on morphological types.

Unit V: Syntax

a. Sentence: Definition and types; Basic phrasal categories.
b. Phrase structure: x-bar theory; concepts of head, specifier and complements. Projection and extended projection principles. Maximal projections of lexical and functional categories.
c. Modules: concepts of government, C-command, movement; theta theory, case theory, binding theory, bounding theory and control theory.

Unit VI: Generative Phonology

a. Distinctive feature and natural class; Jakobsonian features, Chomsky and Halle's feature analysis.
b. Rule formalism and rule ordering: basic rule notation, abbreviatory devices; rule ordering hypothesis, functional considerations; naturalness and markedness.
c. Constraints: The syllable; Representation of syllable structure; onset rhyme theory; mora theory; The CV-tier; A generative CV-phonology model of syllable structure. Tone and intonation; Metrical phonology;

Unit VII: Sociolinguistics

a. Sociolinguistics and sociology of language; speech community; language, dialects, register, isoglosses, diffusion and wave theory.
b. Language culture and thought.
c. Language change and language contact.
d. Literacy: Education policy; language policy in multi-lingual contexts; language immersion.

Unit VIII: Language Typology

a. Language universals; types of universals; genetic; India as a linguistic area; Chomsky's concept of language universals and of parametric variation.
b. Phonological and morphological typology Syntactic Typology: Word order typology (Lehman's Hawkin's and Vennemann's approaches; participal and genitival constructions with special reference to South Asian languages.
c. Semantic and sociolinguistic typology: Universals of the semantics of kinship and color terms; politeness phenomena and Brown and Levinson's cross cultural universals.

Unit IX: language Education

a. Theories of second language acquisition: Second language learning: history; the main approaches the role of L1 in SLA; Krashen's Monitor Model; Schumann's Acculturation Model; Accommodation theories.
b. Language teaching method: Methods of language teaching: Grammar translation methods, communicative approach etc.
c. Social psychological aspects.
d. Teaching a second language: the affective filter; role of the teacher and teaching materials syllabus, second and foreign language teaching.
e. Consequences of learning another language: The bilingual brain; bilingualism and cognitive development; SLA and bilingual education; metalinguistic awareness; bilingualism and biculturalism.
f. Language Testing and Evaluation.

Unit X: Multilingualism

a. Basic concepts; social and social psychological aspects of multilingualism; multilingualism and the human brain; ethnographic perspectives.
b. Multilingual societies: language in education and the multilingual classroom; patterns of language use and language dominance configuration; language of ethnicity and race societies.
c. Language attitudes and social stereotypes; language and identity; measurement of social and linguistic attitudes.

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