TECHNICAL KNOWLEDGE IN ESTATE MANAGEMENT

[100 Marks: 50 Questions]

Building Materials and Construction

Building Materials: Bricks - Types of Bricks, Indian standard classification, properties; Stones - Types of stones, classification, properties, dressing and polishing of stones; Methods of Quarrying; Cement - Different grades and types of cement, properties and IS specifications; Aggregates - coarse and fine aggregate, properties and IS specifications; Cement Mortar - Proportions of cement mortar for various applications; Concrete - Constituents of Concrete, Different grades of Concrete, mix proportioning using IS Code, Properties of fresh and hardened Concrete; Admixtures - Types of Admixtures.

Construction Techniques: Building construction techniques, methods and details; Building systems and prefabrication of building elements; Alternative building materials; Civil Engineering Drawings and Measurements; Building and their classification functional components and requirements of a building; loads on a structure; Foundations; Earthquakes and Earthquake resistant structures.

Strength of Materials and Structural Systems

Strength of Materials: Simple stresses and strains, elastic constants and relationship between them; Compound bars; Temperature stresses; Shear forces and bending moment diagrams for beams; Principal stresses and Mohr's circle of stress; Theory of bending and bending stresses; Shear stress distribution; Theory of torsion; Springs; Deflections of beams; Thin and thick cylinders; Analysis of trusses, Betti-Maxwell theorem; Shear centre and unsymmetrical bending.

Theory of Structures: Direct and bending stresses; Columns and struts; Strain energy method; Moving loads and influence lines; Arches and suspension bridges; Static and kinematic indeterminacy; Moment distribution, Slope deflection, and Kani's method; Analysis of continuous beams and portal frames; Column analogy and matrix methods of analysis.

RCC and Steel Structures

Concrete Structures: Materials, permissible stresses and IS Specifications; Working stress methods; Limit State Method - Stress Blocks parameters, design of Beams, Slabs, Columns and Footing; Design for Shear and Torsion; Design of Retaining Walls, Water tanks, and T-Beam Slab bridges; Yield line theory.

Steel Structures: Properties of steel sections, permissible stresses, IS Specifications; Riveted and welded joints and connections; Design of simple and compound Beams and Columns, Column bases, Roof trusses, Plate and Gantry Girders; Plate Girder Lattice Girder Railway bridges, and Bearings; Plastic analysis.

Pre-Stressed Concrete: Basic concepts, material for pre-stressing, losses in Pre-stress, classification of pre-stressing system; Analysis of PSC Sections.

Soil Mechanics and Foundation Engineering

Soil Mechanics: Physical properties of soils, Classification and identification, Permeability, Capillarity, Seepage, Compaction, Consolidation, Shear Strength, Earth pressure, Slope stability.

Foundation Engineering: Site investigations, stress distribution in soils, Bearing capacity, Settlement analysis, Types of Foundation, Pile foundations, Foundations on expansive soils; swelling and its preventions; Coffer dams, Caissons, Dewatering, Bracing for excavations, Newmark charts, machine foundations.

Engineering Geology: Mineralogy, Structural Geology, Groundwater Exploration methods; Engineering Geology applications for Tunnels, Dams and Reservoirs; Geological hazards and preventive measures.

Estimation, Costing and Construction Management

Estimation and Costing: Abstract estimate; Detailed estimate - centreline, long & short wall method, various items of Civil Engineering works as per Indian Standard; General Specifications - Earth Work, Brick/Stone Masonry in Cement Mortar, RCC, Plastering in Cement Mortar, Floor finishes, whitewash, colourwash; Standard schedule of rates, lead and lift, preparation of lead statement; Computation of earth work - Mid-ordinate, Mean Sectional area, Trapezoidal method, Prismoidal Rule; Approximate estimate - Plinth area and cubic rate estimate.

Project Management: Project management techniques - PERT, CPM; Professional practice and ethics; Construction planning and scheduling.

Surveying and Geomatics

Surveying: Principle and classification of surveying, chain surveying; Compass surveying; Levelling and contouring; Theodolite surveying, curves; Introduction and Fundamental concepts of electronic measuring instruments - EDM, Total station, GIS & GPS.

Advanced Surveying: Tools and techniques of Surveys – Physical, Topographical, Land use and Socio-economic Surveys; Maps - scale, coordinate system; Distance and angle measurement; Application of G.I.S and Remote Sensing techniques in urban and regional planning; Photogrammetry and Remote Sensing basics.

Town Planning and Urban Development

Planning Concepts: Land use planning, building bye-laws, Development Plan or Master Plan, IP Schemes, Concepts of Zoning; Salient concepts, theories and principles of urban planning; concepts of cities - Eco-City, Smart City; Development controls – FAR, densities and building byelaws.

Housing and Development: Housing typologies; Concepts, principles and examples of neighbourhood; Residential densities; Affordable Housing; Real estate valuation; Standards for housing and community facilities.

Estate Management Practices

Water Management: Water Supply: Rain Water Harvesting, percolating well, Water Conservation System; Water supply and distribution system; Water treatment; Water harvesting systems.

Sanitary Engineering: Grey water Recycling/portable & Small-scale Sewage Treatment Plant (STP), dual flushing system and Swach Bharath Mission; Sewerage and drainage systems; Sanitary fittings and fixtures; Plumbing systems.

Solid Waste Management: Dustbin Provision (Dry & Wet Waste segregation), Organic Waste Convertor; Municipal Solid Wastes: Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management.

Energy and Environment: Solar energy and Energy efficient Buildings; Thermal, visual and acoustic comfort in built environments; Natural and Mechanical ventilation in buildings; Greenbelt and Landscape Development.

Legal Aspects and Regulations

Property and Registration Laws: Registration Act, 1908 and India Stamp Act, 1899 - laws required to register multiple deeds, instruments, and documents required to transfer the immovable property; proper documentation for property transfer and payment of stamp duty; Transfer of Property Act, 1882 - central act regarding ownership of immovable assets like land in the form of loans, exchanges, gifts, mortgages, leases; Indian Contract Act, 1872 - governs contracts in India, execution, implementation, remedies, and breach of contracts.

Real Estate Regulation: Real Estate Regulatory Authority or Real Estate Regulation and Development Act (RERA), 2016 - marketing, sale, and development of real estate projects; safeguards interests of property purchasers; mandatory registration of real estate properties; state RERA authorities and implementation.

Land Acquisition and Rehabilitation: Rehabilitation and Resettlement Act, 2013 - regulates land acquisition by government; procedure and rules for granting compensation, rehabilitation and resettlement to affected persons; legal redressal mechanisms.

Occupancy and Eviction Laws: Public Premises (Eviction of Unauthorised Occupants) Act, 1971 - eviction procedures for unauthorized occupants from public premises; Valuation, Standard Rent regulations.

Administrative Laws: Right to Information Act

E-Governance and Technology

Computer Applications: AutoCAD, Computer skills; Computer application in Architecture and Planning; Visual composition in 2D and 3D; E-Governance applications in estate management.

TEST OF REASONING

[15 Marks: 15 Questions]

Logical Reasoning

Statement and Conclusion, Statement and Assumptions, Statement and Arguments, Statement and Course of Action, Cause and Effect, Analytical Decision Making

Seating Arrangement

Circular Arrangement, Linear Arrangement (Single and Double Rows), Square and Rectangular Arrangements, Floor Puzzles

Puzzles

Scheduling Puzzles, Blood Relations-Based Puzzles, Ranking and Order Puzzles, Age-Based Puzzles, Day/Month-Based Puzzles

Analytical Reasoning

Syllogisms, Coding-Decoding, Direction Sense Test, Number and Letter Series, Data Sufficiency

QUANTITATIVE APTITUDE

[15 Marks: 15 Questions]

Data Interpretation

Tabular Data, Line Graphs, Bar Graphs, Pie Charts, Caselets, Mixed Graphs

Arithmetic

Percentages, Ratio and Proportion, Average, Simple and Compound Interest, Profit and Loss, Time and Work, Time Speed and Distance, Partnerships, Probability, Permutation and Combination

Number System

Number Series, Simplification and Approximation, Quadratic Equations, Mathematical Inequalities

Mensuration

Areas and Perimeters, Volumes of 2D and 3D figures, coordinate geometry basics

GENERAL AWARENESS

[15 Marks: 15 Questions]

Current Affairs

Recent developments in housing and urban development, Government schemes and policies, Infrastructure projects, Real estate market trends, Smart city initiatives, Awards and honors, Important days and events

Geography and Environment

Physical geography, Indian geography, Environmental issues, Climate change, Sustainable development, Green building concepts, Disaster management

Indian Polity and Constitution

Constitutional framework, Government structure, Local governance, Panchayati Raj, Municipal administration, Planning Commission and NITI Aayog

Economics and Finance

Basic economic concepts, Indian economy, Banking and finance, Budget and fiscal policies, Economic reforms, Public finance

General Knowledge

Indian history, Science and technology, Sports, Books and authors, Important organizations, Space research, Computer awareness

ENGLISH LANGUAGE

[15 Marks: 15 Questions]

Reading Comprehension

Passage comprehension with questions on main ideas, themes, details, inference-based questions, vocabulary questions, tone analysis

Grammar and Vocabulary

Error spotting, Sentence correction, Fill in the blanks, Cloze test, Phrase replacement, Synonyms and antonyms

Sentence Formation

Para jumbles, Sentence rearrangement, Sentence completion, Paragraph completion

Verbal Ability

Idioms and phrases, Word association and usage, Verbal reasoning, Critical thinking questions

Communication Skills

Business correspondence, Report writing basics, Official communication, Precis writing concepts