

**ASSISTANT TOWN PLANNER IN LOCAL SELF GOVERNMENT**

**DEPARTMENT**

**CAT NO: 572/2024 & 721/2024**

**TOTAL MARKS : 100**

<b>1</b>	<b>Mechanics of Solids (10Marks)</b>
	<p>Properties of Materials, Stress, Strain, Hook's law, Poisson's Ratio, Stress – Strain Diagram, Principles of superposition, Total elongation for bars of circular and rectangular cross sections. Composite section, Volumetric strain, expression for volumetric strain, Elastic constants, relationship among elastic constants, Thermal stresses (including thermal stresses in compound bars). Strain Energy &amp; Impact loading. Stress components on inclined planes, General two-dimensional stress system, Principal planes and stresses and Mohr's circle of stresses.</p> <p>Theory of simple bending, assumptions and limitations. Shearing force and bending moment in beams, SFD and BMD with salient values for cantilever beams, simply supported beams and continuous and overhanging beams considering various loading and Couple. Bending and shear stresses in beams. Definitions of slope, deflection, Elastic curve-derivation of differential equation of flexure, Slope and deflection for standard loading classes using Macaulay's method for prismatic beams and overhanging beams subjected to point loads, UDL and Couple.</p>
<b>2</b>	<b>Surveying &amp; Geomatics (10Marks)</b>
	<p>Classification of survey based on instruments, chain survey-principles-instruments used, errors and corrections, compass survey-bearing, different types and measurements. declination and its correction. Levelling- principle, temporary adjustments and permanent adjustments, difficulties in levelling, reciprocal levelling, various corrections and contouring. Theodolite survey-fundamental lines, traverse surveying, closing error and various methods to apply corrections. Mass haul diagrams. Electronic Distance Measurement, Total Station Survey, Global Positioning Systems, Remote Sensing, Geographical Information System. Curves-horizontal and vertical, transition curves, curve ranging.</p>
<b>3</b>	<b>Construction Technology (10Marks)</b>
	<p>Building materials: General properties, standard requirements and Indian Standard tests for common building materials such as stones, bricks, sand and aggregates, cement, lime, timber and steel. Paints and varnishes. Tests for fresh and hardened concrete, workability of concrete</p> <p>General details of building construction including foundations, brick masonry, stone masonry, flooring, plastering, painting and roofing. Bearing capacity of soil and the methods to determine it. General principles in ventilation, air-conditioning, lighting and acoustics of buildings. Use of Kerala Building Rules, Coastal Regulation Zone (CRZ) classification in planning.</p> <p>Building estimates and specifications, Construction scheduling-PERT and CPM methods</p>
<b>4</b>	<b>Structural Engineering (10Marks)</b>
	<p><b>Steel Structures:</b> Limit State Design philosophy, Design of tension members, beams, simple and built up columns, simple roof trusses and girders, column bases</p>

	<p>and grillages for axially and eccentrically loaded columns. Bolted, riveted and welded connections.</p> <p><b>R.C.C Structures:</b> Limit State Method, Concept, different limit states, Characteristic strength and design strength of materials, Characteristic loads, partial safety factor for loads and material strength limits state of collapse in flexure, assumption, stress strain curves for concrete and steel, stress block, maximum strain in concrete, limiting values of neutral axis for different grades of steel, moment of resistance of singly/ doubly reinforced rectangular sections. Basic principles of R.C.C design in shear, bond and diagonal tension, location of reinforcement. Design of simply supported, overhanging and cantilever beams, rectangular and Tee beams, lintels, axially loaded columns and their bases, cantilever and simple counterfort retaining walls. Design of one way and two way slabs.</p>
5	<p><b>Water Resource and Environmental Engineering (10Marks)</b></p> <p><b>Water Resource Engineering:</b> Hydrologic cycle, Precipitation, Infiltration and Evaporation-measurement and data analysis. Runoff-components and computation, Hydrograph, Unit Hydrograph and S-Hydrograph. Meandering of rivers, river training works. Reservoir - estimation of storage capacity and yield of reservoirs - reservoir sedimentation -useful life of reservoir. Groundwater - Aquifer types and properties – Steady radial flow into a well. Estimation of yield of an open well</p> <p><b>Water Supply Engineering:</b> Quality and quantity of water requirement for public water supplies. Water purification processes, water distribution systems- valves and fittings</p> <p><b>Waste Water Engineering:</b> Wastewater, sources, characteristics, oxygen demand Design of sewers, dry weather flow, storm water flow, Time of concentration. Circular sewers, Partial flow and full flow conditions. Sewer appurtenances, Design of various treatment units-Screening, Grit chamber, Sedimentation tank, Activated Sludge process, Trickling filter, Rotating biological contactor, Septic tanks, Imhoff tanks, Oxidation ditches, Oxidation ponds, Upflow anaerobic sludge blanket reactors, Sludge digestion, Sludge drying bed.</p>
6	<p><b>Sustainable and Cost effectiveness in Architecture (10 Marks)</b></p> <p>Environmental issues and Impacts- Pollution, Climate change, Urban Heat Island (UHI), Desertification, Coastal flooding, Water shortage, Imbalance in ecosystem, Food security. Water and waste management. Rainwater harvesting systems. Ecological footprint, Low impact design, Depletion of earth's resources &amp; Carrying capacity. Energy efficiency, ECBC. Energy use in buildings, Operational energy, Life cycle energy. Renewable, non-renewable, and Alternate energy. Concept of Green rating systems. Indian Systems- GRIHA, IGBC. International rating systems EAM (UK), CASBEE (Japan),</p>

	<p>LEED (US), Green Star (Australia) etc. Stockholm declaration 1972, Brundtland report 1987, Earth summit 1992.</p> <p>Cost Effective Techniques- The inter relation of cost effectiveness and sustainability. Relevance in today's world-Mass housing, individual houses, public, commercial, and institutional buildings. Achieving cost effectiveness through planning and efficient construction management. Pioneers in cost effective construction- Architects like Laurie Baker, Charles Correa, Geoffrey Bawa, Moshe Safdie, Hassan Fathy Research and developments of various agencies dealing with cost effective technology- CBRI- Auroville – Cost ford Nirmiti kendra-Habitat.</p>
<b>7</b>	<b>Climatology and Vernacular Architecture (10 Marks)</b>
	<p>Climate and Architecture, Site climate, Factors affecting site climate, Macro &amp; microclimate, Urban and rural climate, Global climatic factors and context, elements of climate, measurements and data representations, Indian climate classification. Thermal comfort factors, Physiological aspects, body heat balance, comfort indices, comfort range and comfort charts (Psychrometric Chart, Bioclimatic Chart, ET and CET Nomograms). Heat flow through buildings, Conductivity, Resistivity, Specific heat, Conductance, Resistance and Thermal capacity. Design considerations for warm-humid, hot-dry, composite, and upland climates.</p> <p>Vernacular architecture, Role of social, cultural, political, climatic, economic, symbolic, and technological contest in creation of form. How the social and physical environment, climate of the place, materials, and methods of construction impact vernacular architecture. Vernacular houses and townscapes in Kerala. Agraharams of Kerala and Tamil Nādu. Cultural aspects, forms, spatial planning, Architectural morphology, symbolism, art, colour, materials of construction and construction technique, proportioning systems, religious beliefs, and practices in the vernacular architecture in the regions of Kerala and Tamil Nādu.</p>
<b>8</b>	<b>Architectural Conservation and Urban Design (10 Marks)</b>
	<p><b>Architectural Conservation:</b> Definition, Need, Objectives and Scope, Ethics of conservation, Significance, Values in conservation. Heritage- Types of Heritage, Cultural heritage, Natural heritage, Built heritage. Technique of Conservation - Preparatory procedures for conservation. Building material and structural conservation – timber, lime, stone, and laterite. Preparation of Inventories, Initial inspections, Documentation - Research, Degrees of intervention - Prevention of deterioration, Preservation, Consolidation, Restoration, Rehabilitation, Reproduction, Reconstruction. Guidelines for preservation, rehabilitation, and adaptive re-use of historic structures.</p> <p><b>Urban Design:</b> Relationship between architecture, urban design and urban planning. Indian traditional cities and their urban form: Temple towns, Mughal cities, colonial, modern and post-modern influences in the Indian urban context. Basic theories in urban space design and principles of urban spatial organization. Urban form and cities morphology of historic urban spaces:</p>

	Greek, Rome, Medieval towns. Concepts of new urbanism. urban design interventions based on principles of scale, mass, linkages, skyline studies etc. Structure plans, formulation of policies and guidelines for landscape, infrastructure, built form and project implementation methods.
<b>9</b>	<b>Architectural Acoustics (5 Marks)</b>
	Acoustics: Concept of reverberation and reverberation time . Calculation of reverberation time - Sabine's formula. Sound transmission - Noise criteria –NC curve - Transmission loss - permissible noise levels for different types of spaces. Acoustical defects. Noise sources - air borne and structure borne. Room Acoustics - Behaviour of sound in enclosed spaces. Sound Absorption. Sound absorption coefficient, Sound absorbing materials, Porous materials, Panel materials, Resonators. Space absorbers - variable absorbers. Effect of noise on human beings - Methods of preventing air borne and structure borne noises. The human ear and hearing characteristics - Instruments and equipment's. The nature of sound - propagation of sound-velocity, frequency, and wavelength of sound. Sound pressure - Sound intensity and loudness- Decibel and Phons.
<b>10</b>	<b>Urban Planning (15 Marks)</b>
	<p>Classification of Urban areas: Town, city, metropolis, megalopolis, and their interdependence. Census classification of towns in India. Definition of urban area, CBD, nodes, peri-urban areas, conurbation, sprawl, and ribbon development. The process of urbanisation and its impact on environment. Need for planned development. Planning Process &amp; Implementation in India: Urbanisation in India. Contents of Perspective plan, Regional Plan, Development plan, Local area plan etc and their interrelationships. Process of plan preparation, Surveys for plan preparation, Major forms of land use regulation and control in India. Planning legislation in India: Origin and evolution of planning legislation in India, Salient Acts like Environment Protection Act, Coastal Regulation Zone Notification, 73 rd and 74 th Constitutional Amendment Act, Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act 2013, Kerala Town &amp;Country planning Act 2016 etc.</p> <p>Planning theories of Post-industrial age: Contributions by Ebenezer Howard, Lewis Mumford, Patrick Geddes, Clarence Stein, Clarence Perry, C. A. Doxiadis and Le Corbusier to town planning. Planning of 20th century cities: Chandigarh, Navi Mumbai, Islamabad, Brasilia, Curitiba etc. Early models of Urban structure: Concentric ring model, Sector model, Multiple nuclei model. Current Planning trends: New Urbanism, Transit Oriented Development, Inclusive cities, Sustainable cities, Resilient cities and Smart cities.</p>

**NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper**