

# INDICATIVE SYLLABUS

## ➤ Assistant Director (Landscape)

Post Code :01

### Part-I:-

1. **Plants:** Familiarity with local flora; criteria for plant selection; history of planting design; planting as a design element with respect to trees, shrubs, ground cover and creepers; planting features like form, leaf color and texture, color of flowers and fruits in different seasons; role of plant material in environmental improvement (e.g. soil conservation, modification of microclimate); maintenance of plant material; preparation of planting concepts, planting plans and plant schedules; estimation of costs and bill of quantity. Planting design in various environments such as woodlands, forests, rural areas, urban areas, roadside planting in urban and rural areas, industrial sites and in habitats such as grasslands, woodlands, sloping areas, marshes, bogs, wetlands, waterside and aquatic planting etc. Planting for shelter, windbreaks and shelter belts, visual effect and accent; Field ecology: Quadrat, line transect, community analysis.
2. **Geology, Hydrology & Geomorphology:** minerals and metals; rock type (igneous, sedimentary, metamorphic); principles of stratigraphy and geology of India; relationships between geology, soils and vegetation; morphology and classification of soil type; properties of soils; soil management (evaluation, water conservation, fertility and plant nutrition, degradation control and reclamation techniques); hydrological cycle, sources of surface water; watersheds and drainage basins; infiltration characteristics; rainwater harvesting, artificial recharge; groundwater management, ground water pollution; landscape evolution. .
3. **Site Planning and Landscape Engineering:** Site planning process; site character and design requirement relation; site survey and appraisal; contours and grading principles; efficient surface drainage pattern and watershed area, calculation of surface runoff, catchments areas and discharge rate; types of drainage systems, design of surface and sub-surface drainage elements; sports field drainage; earthwork volume computations; construction of roads, parking, paths, plazas, planter, water elements, etc; external lighting; irrigation and plumbing system; street/ site furniture; landscape working drawings; site mobilization and protection measures; water conservation; protection of water retention structures; soil conservation and erosion control measures; land reclamation and rehabilitation process; disposal of sludge, fly-ash, solid and liquid waste; transportation corridors; environment-friendly materials; sustainable landscape features (bioswales, bio retention ponds etc); estimation of costs and preparation of bill of quantities, specifications and tender documents. .
4. **Landscape Design and Communication:** Urban and rural landscape appraisal, analysis and design; application of ecological principles; language skills for technical report 'writing and- professional communications with planning authorities, statutory bodies, contractors and other professionals; communication techniques in digital media; research ability towards establishing a strong theoretical background. Ecology: Concept of ecosystem: energy flow; production; biogeochemical cycles; carbon cycle, global water cycles, nitrogen cycle; bioaccumulation and biomagnifications; ecosystem services; ecosystem types; ecological succession and maturity; population dynamics; ecosystem management; climate change.
5. **Theory of Landscape Architecture:** Concepts of space, time and scale in terms of garden, landscape and nature; evolution of landscape and garden design in relation to art, architecture and city planning; changing perceptions of man's relationship with nature in various phases of history; environmental and behavioral theories; social and cultural dimensions of landscape; Ancient Indian traditions; Landscape from various geographic locations and periods, highlighting aspects of Form, Space and Order; Development of landscape design and gardens; Eastern, Central and Western traditions; Ancient Heritage: Mesopotamia, Egypt, Greece, Rome. Western Civilization: Europe; Italy, France and England. The middle-east: The Persian tradition and its far reaching influence. Eastern Civilisation: China and Japan. Ancient and medieval period in India; Mughal and Rajput Landscapes. Influences and linkages across cultures and traditions, e.g Chinese tradition and the English Landscape style, influence of Persian traditions towards the West and East. Colonial landscape development in India.

6. **Nineteenth Century Europe:** Open space development in its urban design and planning context. Early industrial towns and the Garden City movement. USA: Further evolution of the public park as a major component of urban landscape. The work of F. L. Olmsted and other pioneers. Park-Systems and suburban development centered on open space. The Modern Movement: changing concepts of space and the relationship of architecture and landscape illustrated through studies of selected works of the modern masters. Post-war development in Europe: New Towns in England and the concept of Landscape Structure. Landscape Urbanism; Examples of open space development in new towns and urban renewal to illustrate the close conceptual relationship between town planning, urban design and landscape architecture (e.g. Haussmann's Paris, Lutyen's Delhi); influence of Ian McHarg on mid and late 20th Century landscape architecture. The work of selected twentieth century landscape architects, in the west as well as in India. Contemporary concepts and concerns: "Green" Architecture and EnergySaving site planning and Landscape Architecture; Cultural landscapes, their definition, identification, characteristics and policies; Landscape inventory and conservation of historical landscape; Artistic sensibility in Landscape Architecture, land art; new developments in urban landscape design. The Indian Context: Understanding contemporary attitudes to open space design in India: ancient horticultural tradition, Mughal influence, British colonial influence. Trends in landscape design in India in the late 20th and the first decade of the 21st Century.
7. **Landscape Economics, Management & Horticultural Practice:** Economics: Cost and benefits related to open space development; costs: intangible costs, depletion of natural resources, Management: Landscape management at the regional scale in relation to soil conservation, water management, grassland management, forestry and agriculture. Management practices related to urban ecology and urban habitats, such as urban forests, river banks, regional parks and greenbelts: ecological, economic and administrative issues. Management models. Horticulture Practice: Nursery establishment and Plant propagation. Establishment and maintenance of grass, shrubs and trees with respect to: ground preparation, planting and transplanting, pruning; .
8. **Landscape Resources:** Settlements and Landscape: Siting and evolution of cities; Role of landform, water systems, climate and vegetation; Illustrative studies of cities in India and elsewhere; Microclimate; Air pollution; Solid waste management; conservation of water resources and vegetation cover; Urban forest; Landscape heritage; City development Plans, Zonal Plans. Development controls and their role in the conservation and creation of urban landscape; Delhi Master Plan; National Environment Policy; The rural landscape; Forest types of India; Biodiversity, urban biodiversity, Wetlands: definition, wetland values and conservations; Wastelands management; Land reclamation and rehabilitation; Watersheds and its management; Ramsar Convention, Forest Policy and management of forest resources. Conservation Forestry, Bye laws and planning regulations applicable to landscape development. .
9. **Landscape Conservation and Regional Landscape Planning;** Concept of Landscape Planning and Landscape Conservation; Landscape Assessment techniques; Basic quantitative methods of collecting, analyzing, projecting and presenting data for Landscape Planning. Landscape Conservation: Priorities, Policies and Programmes; National parks and other protective designations; Biodiversity and Biosphere reserves; Endangered landscapes; Aspects of watershed management. The application of landscape planning techniques to large scale developments such as infrastructure and power projects, extractive and manufacturing industry, new towns and urban extensions, and developments for tourism and eco-tourism; Landscape perception, visual assessment and the aesthetic dimension of landscape planning. Environmental Impact Assessment and the Environmental Impact Statement: Theory and Practice; role of Environmental Legislation and the Ministry of Environment and Forests. .
10. **Landscape Project Management and Professional Practice:** The role of statutory and regulatory bodies such as the Municipal Corporation, N.D.M.C, D.D.A and Urban Art commission etc.; Construction administration , Implementation process; Sequence of activities from inception to completion; progress evaluation and monitoring: (Estimation), Site documentation, Techniques of inspection and quality control; Construction documents Comparison of various kind of tenders with regard to objectives, utility and appropriateness. Tender Documentation and evaluation of tender; negotiations with contractors. Contract Documentation: Forms of contract; General and special conditions, specifications, Bill of quantities; significant clauses pertaining to defects, maintenance, arbitrations, etc. Parties to the contract; their roles, contractual relationships and legal obligations;

Forms of agreement, conditions of engagement, scope of work and services to be provided. Scale of Professional Fees: Relationship of Landscape Architect with other professionals. Landscape Design Competitions: Types, Guidelines.

## **Part-II:-**

**To measure candidate's reasoning ability, quantitative aptitude and proficiency in English and General Awareness**

- a) Test of Reasoning
- b) Test of Quantitative Aptitude
- c) Test of General Awareness and
- d) Test of English Language

## **➤ Junior Engineer (Civil)**

**Post Code: 02**

### **Civil Engineering**

**Building Materials:** Physical and Chemical properties, classification, standard tests, uses and manufacture/quarrying of materials e.g. building stones, silicate based materials, cement (Portland), Asbestos products, Timber and Wood based Products, laminates, bituminous materials, paints, varnishes.

**Surveying:** Principles of surveying, working of properties, compass and bearing, plane table surveying, theodolite traverse, adjustment of theodolite, levelling and contouring, curvature, refraction, permanent adjustment of dumpy level, methods of contouring and uses of a control map, tachometric survey.

**Soil Mechanics:** Origin of soil phase diagram, definitions of void ratio, porosity, degree of saturation, water content, specific gravity of soil grains and unit weights, grain size distribution curves for different soil and their uses. Atterberg's limits, ISI soil classification, plasticity chart, coefficient of permeability, effective stress, consolidation of soils. Calculation of shear strength of soils, direct shear test, vane shear test, triaxial test, soil compaction, Lab compaction, Lab compaction test, moisture content and bearing capacity of soils, plate load test, standard penetration test.

**Hydraulics:** Fluid properties, hydrostatics, measurements of flow, Bernoulli's theorem and its application, flow through pipes, flow in open channels, weirs, flumes, spillways, pumps and turbines.

**Environmental Engineering:** Quality of water, source of water supply, purification of water, distribution of water, need of sanitation, sewerage system, circular sewers, oval sewer, sewer appurtenances, surface water drainage, sewage treatments.

**Structural Engineering:** Theory of structures: Elasticity constants, type of beams, determinate and indeterminate, bending moment and shear force diagrams of simply supported, cantilever and over hanging beams. Moment of area and moment of inertia for rect. & circular section, bending moment and shear stress for tee, channel and compound sections, chimneys, dams and retaining walls, eccentric loads, slope deflection of simply supported and cantilever beams, critical load and columns, torsion of circular section.

**Concrete Technology:** Properties, Advantages and uses of concrete, cement aggregates quality, water cement ratio, workability, mix design, storage, batching, mixing, placement, compaction, finishing and

curing of concrete, quality control of concrete, hot weather and cold weather concreting, repair and maintenance of concrete structure.

**RCC Design:**

**RCC beams:** flexural strength, shear strength, bond strength, design of single reinforced beams, lintels, cantilever beams, double reinforced beams, one way slabs, two way slabs, isolated footings, reinforced brick work. T-beams, columns, staircases, retaining walls, water tanks (RCC design questions may be based on both Limit State method and Working Stress method).

**Steel Design:** Steel design and construction of steel columns, beams, roof trusses, plate girders.

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➤ **Junior Engineer (Electrical/Mechanical)**

**Post Code: 03**

**General Engineering (Electrical and Mechanical)**

• **Electrical Engineering**

**Basic Electrical Engg.:** Elect. Measurements, Concepts of current, voltage, resistance, power and energy, their units, Ohm's law.

**Circuit Law:** Kirchoff's law, solution of simple network problems, Network theorems and their applications, Electro-magnetism, concept of flux, e m f, reluctance, magnetic circuits. Electro-magnetic induction, self and mutual inductance. A.C. fundamentals, instantaneous, peak, R.M.S. and average values of alternating waves, Equation of sinusoidal wave form, simple series and parallel AC circuits consisting of R.L. and C, Resonance. Measurement and measuring instruments, Moving coil and moving iron ammeters and voltmeters, Extension of range, Wattmeters, Multimeters, megger, Basic Electronics.

**Electrical machines:** Basic principles of D.C. motors, generators, their characteristics, Speed control and starting of D.C. motors, losses and efficiency of D.C. machines. 1-Phase and 3-phase transformers: Principles of operation, equivalent circuit, voltage regulation, O.C. and S.C. tests, efficiency, auto transformers. Synchronous machines, generation of 3-phase e m f, armature reaction, Voltage regulation, parallel operation of two alternators, synchronizing, starting and applications of synchronous motors. 3-Phase Induction motor, rotating magnetic field, principle of operation, equivalent circuit, torque-speed characteristics, starting and speed control of 3-phase induction motors, Fractional KW motors, 1-phase induction motors, A.C. series motor, reluctance motor.

**General, Transmission and Distribution:** Different types of power stations, Load factor, diversity factor, demand factor, simple problems thereon, cost of generation, inter-connection of power stations. Power factor improvement, various types of tariffs, types of faults, short circuit current for symmetrical

faults. Switchgears- rating of circuit breakers: Principles of a extinction by oil and air, H.R.C. fuses, Protection, earth leakage, over current, Buchhotgz relay, Merz- Prince system of protection of generators & transformers, protection of feeders and bus bars. Lightning arresters, Various transmission and distribution systems, Comparison of conductor materials, efficiency for different systems. Utilization of Electrical Energy, Illumination, electric heating, Electric welding, electroplating, electric drives and motors.

- **Mechanical Engineering**

**Flow of Fluids:** Laminar & turbulent flow, equation of continuity, Bernoulli's theorem, measurement of discharge, flow through pipes, friction losses, Forces of jet impinging on vanes, blades, work done and efficiency, classification of turbines & pumps.

**Thermal Engineering:**

Laws of thermodynamics, change in entropy in various processes; uses of steam, Properties of steam table & charts; Construction & Working of Cochran, Lancashire locomotive & Babcock & Wilcox boilers, working of steam turbine, Otto & Diesel Cycles, working of IC engines, Carburetion, Solex Carburettor. Diesel fuel, pump & injector: Cooling & lubrication.

**Production Engineering:** Foundry- Different casting processes, concept of Patterns; types of mould making, purring defect in castings, causes & remedies, Welding-classification and types of welding, Testing and defects in welds. Lathes- working of lathe, various tools, operation on lathes, types of lathes. Drilling operations performed on drilling machines. Description, principles of working and various operations on machine tools, milling machine, shaper, grinder, boring and slotting machines.

**Strength of Materials:** Stresses in composite bars, relation between elastic constants, Resilience under different types of loads, SF and BM diagrams; stresses in beams-combined direct and bending stresses, Struts and columns – Euler's and Rankin's theories, Torsion of circular shafts.

**Theory of Machines:** Simple Machines – Four bar chain, Slider crank chain, double slider crank chain, Flywheel – Turning moment diagrams. Fluctuation of energy, Friction-in collar and pivots, plate clutch, conical clutch, journal bearing. Transmission of power through flat and V-belts, Gears, profile of gears, Governors- Watt and Hartnell governors

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## ➤ Programmer

**Post Code: 04**

### Part-I

- ❖ Computer Architecture, Computer Organization. Data Communication And Net-Working, Artificial Intelligence, Micro-Processors, Number Systems & Digital Logics, Peripherals And Storage Devices.
- ❖ Operating Systems: Windows, Unix And Linux
- ❖ Programming: - Programming in Angular Java, PSP, Asp.Net, Java And Android/ Mobile Aps Programming, Programming In D2k, Programming In Visual Basic, PL/SQL, HTML.
- ❖ Data Base Management (DBMS):- Oracle 8i And Above, SQL server 2003 and above, Open Sources DBMS, My SQL Sybase Ingress etc.
- ❖ Internet and Web Technologies

### Part-II

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## ➤ Junior Translator (Official Language)

**Post Code: 05**

### ❖ **Stage-I:**

a) General Hindi: 100 marks (Objective type) b) General English : 100 marks (Objective type)  
The questions will be designed to test the candidates' understanding of the languages and literature, correct use of words, phrases and idioms and ability to write the languages correctly, precisely and effectively. The questions will be of degree level.

### ❖ **Stage-II:**

Translation and Essay: 200 Marks (Conventional Type) The paper will contain two passages for translation-one passage for translation from Hindi to English and one passage for translation from English to Hindi, and an Essay each in Hindi and English, to test the candidates' translation skills and their ability to write as well as comprehend the two languages correctly, precisely and effectively. The level of the paper will be consistent with the educational qualifications prescribed.

**Part-I**

**i. Basic concepts of urban planning and Architecture, Planning Legislation and GIS.**

**Section 1: Architecture**

Elements, construction, architectural styles and examples of different periods of Indian and Western History of Architecture; Oriental, Vernacular and Traditional architecture; Architectural developments since Industrial Revolution; Influence of modern art on architecture; Art nouveau, Eclecticism, International styles, Post Modernism, Deconstruction in architecture; Recent trends in Contemporary Architecture; Works of renowned national and international architects.

**Section 2: Environmental Planning and Design**

Ecosystem- natural and man-made ecosystems; Ecological principles Concepts of Environmental Impact Analysis; Environmental considerations in planning and design; database for incorporation of environmental concerns in planning analysis, land suitability analysis, vulnerability analysis; Climate responsive design; Solar architecture; methods of addressing environmental quality; Green Building Concepts and Rating; ECBC; Building Performance Simulation and Evaluation; Environmental pollution- types, cause, controls and abatement strategies.

**Section 3: Services, Infrastructure and Transportation**

Urban infrastructure- Transportation, Water Supply, Sewerage, Drainage, Solid Waste Management, Electricity and Communications, Process and Principles of Transportation Planning and Traffic Engineering; Road capacity; Traffic survey method; Traffic flow characteristics; Traffic analyses and design considerations; Travel demand forecasting; Land use transportation – urban from inter-relationships; Design of roads, intersections/ grade separates and parking areas, Hierarchy of roads and level of service; Traffic and transport management and control in urban areas; Mass transportation planning; Para-transits and other modes of transportations Pedestrian and slow moving traffic planning; Intelligent Transportation Systems.

**Section 4: Planning Legislation and GIS**

Planning legislation will include acts and legislation related to development management and maintenance of Delhi and other towns of NCR, municipal corporation and local bodies, Land Acquisition Act, PPP etc. Local self- Governance.

- ii. **Delhi Development Act, (DD Act), 1957 will include all sections and provisions of the Act.**
- iii. **Master plan of Delhi 1962-2021 will include provisions, strategies and Master Plan proposals as per documents published from time to time.**

**Part-II:**

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