



Syllabus & Scheme of Examination for the post of **JUNIOR ENGINEER**

Stream: Civil Engineering

Level - 1 MCQ Test

Building Materials: Standard tests, uses, and manufacture of cement (Portland), timber and wood-based products, laminates, bituminous materials, paints, varnishes.

Concrete Technology: Properties, Advantages and uses of concrete, cement aggregates, and importance of water quality, water cement ratio, workability, mix design, storage, batching, mixing, placement, compaction, finishing, and curing of concrete, quality control of concrete, repair, and Maintenance of concrete structures

Building Construction: types of buildings as per the National Building Code. Building components and their basic requirements. **Damp proofing- causes, effects and methods.**

Plinth: Definition, necessity, Construction. Green Building and Design Features, Energy Audit and Environmental Impact Assessment (EIA), Energy and Energy conservation, Green Building and Rating System

Estimating, Costing and Valuation: estimate, glossary of technical terms, analysis of rates, methods and unit of measurement, Items of work – earthwork, Brick work (Modular & Traditional bricks), RCC work, Shuttering, Timber work, Painting, Flooring, Plastering, Boundary wall. Valuation – Value and cost, scrap value, salvage value, assessed value, sinking fund, depreciation and obsolescence, methods of valuation.

Contracts: Understanding the stakeholders/parties involved in a construction contract; Legal Framework/Contract formation and What Constitutes a Contract - using the framework of the Indian Contract Act 1872; Various types of contracts; Rules of interpreting a contract; Commercial terms; Conditions of a contract; Significant contract clauses and risk analysis of key dispute-prone clauses, with case studies; Dispute resolutions - litigation, arbitration and alternative dispute resolution techniques.

Basic Surveying: Overview and Classification of Survey, Chain Surveying, Compass Traverse Survey, Levelling and Contouring, Measurement of Area and Volume, Theodolite Surveying, Tacheometric surveying and Curve setting, Total station.

Geotechnical Engineering: Grain size distribution curves and their uses, Index and engineering properties of soils, compaction of soils, Site investigation, standard penetration test, shallow and deep foundations, safe bearing capacity of soil, Function and requirements of good foundation, types of foundation, introduction to spread, combined, strap, mat and pile foundation.

Transportation Engineering: Highway Engineering – cross-sectional elements, geometric design, types of pavements, pavement materials – aggregates and bitumen, different tests, Design of flexible and rigid pavements – Water Bound Macadam (WBM) and Wet Mix Macadam (WMM), Gravel Road, Bituminous construction, Rigid pavement, pavement maintenance.

Environmental Engineering: Quality of water, source of water supply, purification of water, distribution of water, need for sanitation, sewage treatments, Surface water drainage, Solid waste management – types, effects, engineered management system, management of e-waste.

Structural Engineering: Theory of structures: Elasticity constants, types of beams – determinate and indeterminate, bending moment and shear force diagrams of simply supported, cantilever, and overhanging beams.

RCC Design: RCC beams-flexural strength, shear strength, bond strength, design of singly reinforced and double reinforced beams, cantilever beams T-beam, One way and two way slabs, columns,

HVAC: Types of AC System - Air cooled / Water Cooled/ DX / Chilled Water. Types of Air Conditioning Equipment -Unitary, Split System, Package AC, Chilled Water (AHU, FCU & FAHU), and VRV System.

Level – 2 Trade Test

- (i) Estimating, measurement of quantities and costing
- (ii) Surveying
- (iii) Material Testing (Cement, concrete, brick, aggregates)
- (iv) Contracts

Scheme of Examination:

Level	Type of Test	Weightage for final result
Level-1	MCQ Test	50%
Level-2	Trade Test	50%

- The shortlisted candidates should appear for Level -1 MCQ Test and Level -2 Trade Test.
- A minimum of 5X candidates shall be shortlisted (for X number of posts advertised) for the Level-2 Trade Test, based on their performance in the Level-1 MCQ Test.
- The questions shall generally be on the minimum qualification level.

Date: 05.02.2026

**Sd/-
Registrar**