

**Syllabus and Scheme for the Post of Junior Laboratory Assistant (Technical)  
Construction & Maintenance- Civil  
Post Code- 013**

**Reference: Advertisement No. IIT Mandi/Recruit./NTS/2025/05 Dated: 17.12.2025**

There will be two-stage examination.

**Stage I:** Written Examination (Objective type)

**Stage II:** Skill/Trade Test

**Syllabus:**

**Construction Materials**

Physical and chemical properties, classification, standard tests, uses, and manufacture/quarrying of materials such as stones, silicate-based materials, cement, timber and wood-based products, laminates, bituminous materials, and paints.

**Estimating, Costing, and Valuation**

Estimation, glossary of technical terms, analysis of rates, methods and units of measurement, items of work, CPWD norms, and Schedule of Rates; value and cost, scrap value, salvage value, assessed value, sinking fund, depreciation, and obsolescence; methods of valuation.

**Surveying**

Principles of surveying, measurement of distance, chain surveying, working of the prismatic compass, compass traversing, bearings, local attraction, plane table surveying, theodolite traversing, adjustment of theodolite, levelling, definitions of terms used in levelling, contouring, curvature and refraction corrections, temporary and permanent adjustments of dumpy level, methods of contouring, uses of contour maps, tachometric survey, curve setting, earthwork calculation, and advanced surveying equipment.

**Soil Mechanics and Foundation Engineering**

Soil formation and characterization; phase relationships, index properties, and classification; permeability and seepage; concepts of effective stress and pore water pressure; compressibility and consolidation; stress distribution in soils; lateral earth pressure; shear strength; soil exploration; slope stability and retaining structures; shallow and deep foundations, including their types and applications; concepts of bearing capacity and settlement calculations.

**Transportation Engineering**

Highway engineering — cross-sectional elements, geometric design, types of pavements, pavement materials and quality assurance, bituminous construction, rigid pavement joints, pavement maintenance, highway drainage, traffic signs and markings, and road safety.

**Environmental Engineering**

Chemical and physical processes for water treatment; different schemes for water distribution; wastewater treatment; operation of WTP and STP; norms related to pollution control and compliance; solid waste management, etc.

**Strength of Materials and Structures**

Concepts of stress and strain, analysis of determinate trusses; shear force and bending moment in determinate beams; simple bending theory; Euler's theory for columns; and critical load for columns with different end conditions.

**Concrete Technology**

Properties, advantages, and uses of concrete; cement and aggregates; importance of water 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 structures; and Indian Standard guidelines for quality control.

**Design of Structures**

Concepts of limit state and working stress methods of design; design and detailing of RCC beams, slabs, columns, and isolated footings; relevant IS guidelines for design and detailing.

**Building Planning and Bye-laws**

Urban planning and zoning control; general building requirements; safety and structural integrity; environmental and civic sustainability; national and local bye-laws; National Building Code provisions; accessibility requirements and special rules.

**Office Work Knowledge**

Construction management, time scheduling, quality management, and safety; bill processing; knowledge of the tendering process and different types of contracts; hands-on experience in commonly used software such as Word, Excel, PowerPoint, and civil engineering-related technical software; legal and ethical aspects of construction.

**General Knowledge**

General awareness, current affairs, general aptitude, and reasoning.

## **Important Instructions for candidates:**

### **General information about the exam:**

- The MCQs have negative marking for wrong answers. The unanswered questions will not be considered for evaluation. (*i.e.*, no marks will be awarded for any question not attempted).
- Only one best-suited answer has to be given for any MCQ. More than one answer will be treated as wrong answer.
- Use of only blue or black ballpoint pen is permitted to answer the questions and fill the form in the exam hall. Use of ink pen/gel pen/pencil/whitener is not permitted.
- Use of calculator, cell phones, log book, periodic table, and any type of electronic device etc., are strictly prohibited.
- Involvement in any malpractices will lead to disqualification
- Any additional instructions given during the selection process must be adhered/complied.

### **Final Selection:**

- Examinations for Stage-I and Stage-II will be conducted for all the candidates or as decided by the selection committee.
- Final selection will be made on the scores obtained in the Stage-I, as the Stage –II is of qualifying nature. But if a candidate fails to qualify in Stage-II, her/his candidature will not be considered further.
- Please note that for consideration in the merit list, a candidate has to secure minimum marks fixed by the selection committee in both exams at Stage-I and Stage-II – failing which institute will not make an offer of appointment even if vacancies go unfilled.