

Syllabus for Trade Test for the Post of Estate Officer

1. **Building materials and construction:** - Quality Evaluation Tests on various Building materials such as lime, cement, fly ash, mortar, timber, Steel, Concrete, Bricks, and stones. All main tests as per relevant codes.
2. **Surveying:** - Surveying methods: chain, compass, leveling, and Plane table surveying: Radiation, Intersection. Traversing and Contouring.
3. **Strength of materials:** - Tensile Test of Steel to determine yield strength, ultimate tensile strength, percentage elongation, and modulus of elasticity of structural steel, Bending tests on simply supported beam and Cantilever beam, Compression test on concrete, Impact test of steel to determine the impact strength of notched mild steel test piece using Charpy Test and Izod Test, Shear test. Determination of torsion and deflection to measure the angle of twist, ultimate Torsional Strength Stress strain curve, strain measurement in bar, and Yield/tensile strength of steel bar.
4. **Concrete Technology-** Tests of Cement, Aggregate such as Sieve analysis, Flakiness index, Elongation index, Aggregate impact test, Aggregate crushing test, Specific gravity, water absorption and natural course of fine & coarse aggregate. Test on Designed fresh concrete: Workability of concrete, Compaction factor test, Test on Designed Hardened Concrete: compressive strength of concrete, Flexure strength, Split tensile strength and Nondestructive tests. Principles of Mix proportioning for design mix.
5. **Structural Analysis** – Deflection of curved beams, Behavior of Portal Frame under different load combinations, Deflection of Truss, Behavior of a cantilever beam under symmetrical and unsymmetrical loading. Analysis of two hinged arches. Verification of Horizontal Thrust in a 3-Hinged Arch.
6. **Quantity survey and cost estimation-** Types of preliminary Estimate and Detailed estimate. Introduction to Preparing rates, Labor schedule, material schedule, and rate schedule. Data required for the preparation of an estimate. Analysis of rates for items of work of building for the preparation of detailed project reports (DPR). Estimation of Roads which include earthwork and three-layered metallic roads, Estimation and Valuation, its importance and purpose. Objectives and specifications of Tenders and Contract: Tender notice, tender document, contract-contractor and terms and conditions of contract, Agreement, Form of Contract etc.
7. **Geotechnical Engineering** – Soil identification Tests to utilize various methods of soil investigation in the field and laboratory., Water content Determination Test, Field Density Measurement, specific Gravity Test, Sieve Analysis Test, Sedimentation Analysis Test and Permeability Test. Hydrometer Analysis Compaction Test, Consolidation Test, Plate load test, Permeability Test, Unconfined Compression Test, Direct shear Test and Vane Shear Test.
8. **Transportation Engineering** – Aggregate Crushing Test, Aggregate Impact Test, Los Angeles Abrasion Test, Specific Gravity and Water Absorption Test on Aggregates, C.B.R. Test, and Penetration Test. Tests on bitumen such as softening point, flash and fire point ductility and specific gravity.

Qnsd
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