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Civil Engineering Syllabus for Uttarakhand State Civil Services Preliminary Exam-2011

CIVIL ENGINEERING

Engineering Mechanics: Units and Dimensions, Vectors, Equations of Equilibrium, free body diagram, virtual work, Force distribution system. Velocity and acceleration in Cartesian and Curvilinear coordinates, equation of motion, Principle of Energy, conservation of energy and momentum, rotation of rigid bodies about fixed axis, Mass moment of Inertia.

Theory of structures: Energy theorems, unit load method of consistent deformations for calculation of deflections in Beams & trusses.

Methods of solution of Indeterminate structures like Beams & Plane frames, slope deflection method and moment-distribution method. Force and displacement method of matrix method for analysis of frames and trusses.

Three hinged & two hinged arches, Moving load effect on Arches & Beams. Influence line methods.

Design of Reinforced Concrete Structures: Working stress and limit state method of design, IS code 456, Design of one way and two way slabs. Design of singly, doubly reinforced beams of rectangular, T & L Sections. Design of compression numbers under axial load and uniaxial moment by limit state method. Design of isolated and combined footings in R.C.

Structural Steel Design: Design of fasteners, like welded & bolted joints, Design of tension and compression members in mild steel, Design of simple and built up beams and plate grinders. Design connection for shear & moment transfer in welding, Design of plane trusses & connections.

Building Construction & Planning: Physical and mechanical properties of construction materials like Brick, Cement, Steel and lime. Damp and water proofing materials. Factors of safety, servicibility and detailing of structural elements and stair cases. Provisions for fire proofing and earthquake resistance in building construction.

Construction scheduling. PERT & CPM methods.

Fluid Mechanics: Kinematics of fluid flow, Dynamics of fluid flow, Measurement of flow, Flow through pipe, Open Channel Flow, Pumps and Turbines.

Water Resources Engineering: Hydrology, Water requirement for crops, Distribution system for Canal irrigation, Diversion Headworks, Storage work, Spillways.

Surveying: Levelling, Contouring, Plane Table Survey, Theodolite, Trigonometric Levelling, Tachometirc Survey, Triangulation, Hydrographic Surveying.

Astronomical Surveying: Photogrammetry and photo interpretation. Aerial photogrammetry, Basic definitions of photogrammetry, Radial line plotting, Stereophotogrammetry, Flight Planning

Determination of heights etc. Application of photointerpretation in Civil Engg.

Remote Sensing: Transportation Engineering, Airports and Runways.