

Syllabus for the entrance test of admission to Ph D (Tech) in Civil Engineering

Engineering Mechanics :Statics and Dynamics. Laws of Equilibrium, Centre of Gravity and moment of Inertia and its uses.Resolution and composition of forces.Types of beams and its reactions.Equation of motions.

Strength of Materials – Different types of stresses and strains, Stress-Strain variation for various materials, Bending stress and Shearing stresses. Slope and deflections in beams subjected to various loadings.

Building Construction :Materials used for constructions. Different types of construction for buildings. Load bearing and framed constructions. Types of drawings, Different types of brick and stone masonry, mode of measurement for various items in construction, Quantity surveying. Types of roofs, roof coverings, Types of flooring and its advantages, disadvantages, Types of doors and windows.

Soil Mechanics and Foundation Engineering : Different types of soils, its classification, properties and its evaluation. Determination of bearing capacity, types of foundations for structures, pile foundation – types, design and construction. Open and raft foundations.

Cement manufacturing, types and its properties, supplementary cementitious materials. Various standards for testing of building materials, PCC and RCC. Different grades of concrete, proportioning of ingredients of concrete, mixing, transporting, placing, compacting and curing of concrete. Properties of fresh and hardened concrete.Different tests done on concrete at various stages.Variou performance enhancing construction chemicals, recycling of wastes.Precast and cast in situ construction.

Hydraulics and Environmental Engineering : basics of Hydraulics, pipes in series and parallel, Different water and waste water treatments, various tests performed on water and waste water. B. O. D., C. O. D., different types of microorganisms. Different methods to treat solid, liquid wastes.Standard for potable water.

Irrigation Engineering : Hydrology and its use in necessity, use. Components of runoff, Hydrograph, unit hydrograph and its uses. Control of Floods, Different types of Dams, methods of constructions, forces acting on dams, design of dams, spillways. Canals- types, uses. Well hydraulics.

Structural Engineering :Different methods of analysis of structures, flexibility and stiffness methods of analysis. Properties of different types of steel used in reinforced concrete. Working stress and limit state method of design. Provisions in I S 456-2000. Singly reinforced and doubly reinforced beams, design of slabs, beams, column design. Detailing of reinforcement. Analysis and design of pretention and post tentionprestressed concrete sections.

Transportation Engineering – Different types of means of transport, types of roads, materials and methods of constructions, curves. Use of surveying and levelling, different instruments used in surveying and levelling. Railways and Airports – its importance in transportation, different utilities required for railways and airports. Different types of bridges used in transportation systems. Components of bridges, Method of construction of different bridges.