

PhD Entrance Syllabus

Structure of the PhD Entrance Test (100 Marks)

Section A: Aptitude and Reasoning – Common to all candidates (50 Marks)

Section B: Subject/Domain-Specific (Civil) (50 Marks)

Section A: APTITUDE & REASONING (Common to ALL)

Unit-1: Verbal Reasoning

Navigating Directions and Mastering Distances, Blood Relations, Logical Puzzles and Problem Solving- Floor Based, Month and Year Based. Seating Arrangements - Circular, Linear, Decoding the Code- Letter Coding, Number Coding, Letter and Number Coding.

Unit-2: Number System

Mastering Quick Calculations, BODMAS Simplified, Exploring Numbers and Division Rule, Unit Digits Decoded, Unlocking Divisibility and Counting Zeroes, "Mastering LCM and HCF: Foundations of Factorization, Uncovering Factors, Exploring Remainders.

Unit-3: Arithmetic Ability-1

Percentages - Fraction, Decimal, Percentage Change, Concept of 'By' and 'To', Product Constancy, All About Averages, Profit & Loss Essentials, Articles, False Weight, and Discount Insights - Discount, Simple Interest: Calculations and Applications, Compound Interest: Calculations and Applications, Relationship between SI and CI.

Unit-4: Arithmetic Ability-2

Ratio, Proportion, Partnership, Problems on Ages, Time and Work - Concept of Efficiency, Smart Work with Time and work, Negative Work, Chain Rule, Pipes and Cisterns, Time, Speed & Distance, Problems based on Trains, Problems based on Boats and Streams.

Unit-5: Critical Reasoning

Analogy and Classification, Sequence and Series Logic, Syllogisms - Types of statements, Venn diagrams using statements, Method to solve problems Two Statements and Two Conclusions, EITHER-OR Conclusions, Four Statements and Two Conclusions.

Department of Civil Engineering
School of Engineering
SR University, Warangal

Section: B Civil Engineering Syllabus for Ph.D. Admission Eligibility Test (any 5 Modules)

I. Solid Mechanics: Forces, Equilibrium equation, Stress and strain, Principle of Superposition, Shear force and bending moment, Simple bending theory, Flexural and shear stresses, Torsion, Column buckling

II. Structural Analysis: Statically determinate and indeterminate structures, Stability, Force and Energy methods, Influence lines, Analysis of trusses, arches, continuous beams, cables and frames, Slope deflection and moment distribution methods, Stiffness and flexibility methods.

III. Construction Materials and Management: Construction Materials-Properties, Steel properties, Concrete Constituents, mix design, Concrete properties-fresh, mechanical and durability. Construction Management: Types of construction projects; Project planning and network analysis - PERT and CPM; Cost estimation.

IV. Design of Concrete Structures: Working stress and Limit state design concepts; Design of beams, slabs, columns; Bond and development length; Prestressed concrete beams.

V. Design Steel Structures: Working stress and Limit state design concepts; Design of tension and compression members, Simple and eccentric connections, beam-column connections, plate girders and trusses, Concept of plastic analysis-beams and frames.

VI. Soil Mechanics and Foundation Engineering: Three-phase system, Phase relationships, Soil classification, Flow nets, Uplift pressure, Quick sand condition, Compaction, Consolidation, Shear strength, Mohr's circle, Stress-strain behavior of clays and sands, Stress paths, Sub-surface investigations, Earth pressure theories, Slope stability, Bearing capacity, Combined and raft foundations, Contact pressure, Settlement, Deep foundations, Pile load capacity, Lateral loading, Group efficiency, Skin friction.

VII. Fluid Mechanics and Hydraulic Machines: Properties of fluids, Fluid statics with applications, Laminar and turbulent flow, Flow in pipes, Pipe networks, Lift and drag forces on immersed bodies, Flow measurement in channels and pipes, Dimensional analysis and hydraulic similitude, Channel hydraulics, Energy-depth relationships, critical flow, hydraulic jumps, uniform flow, gradually varied flow and water surface profiles, flood estimation and routing, surface run-off models, groundwater hydrology, aquifers, and application of Darcy's Law.

VIII. Irrigation Engineering: Types and method of irrigation systems, Crop water requirements-Duty, Delta, Evapotranspiration, Gravity dams and spillways, Lined and Unlined Canals, Design of weirs on permeable foundation, Cross drainage structures.

IX. Environmental Engineering: Water quality standards, Water Quality Index (WQI), Water Treatment-Unit processes and operations, Water demand and distribution system; Drinking water treatment. Sewerage system design, Domestic wastewater estimation, Primary and secondary treatment. Effluent discharge standards, Sludge disposal and management, Reuse of treated sewage for different applications, Air pollutants, Air quality standards, Characteristics and generation of municipal solid waste, Solid waste management processes.

X. Highway Pavements and Surveying: Properties and tests for highway materials, Bituminous paving mixes, Design of flexible and rigid pavements using IRC codes. Principles of surveying, Errors analysis, Scales, Coordinate systems, Levelling, Traversing, Triangulation survey, Total station, Horizontal and vertical curves. Photogrammetry and Remote Sensing-Scale, flying height; Basics of remote sensing and GIS.