

**BHARATI VIDYAPEETH**  
**(DEEMED TO BE UNIVERSITY), PUNE, INDIA**  
**PhD Entrance Test – 2025**  
**SECTION-II: Civil Engineering - 35 Marks**

<b>Topics covered</b>	
<b>UNIT-I</b>	<p><b>Hydraulics Engineering :</b>  <b>Hydraulics:</b> Types of fluid flows, Laminar and Turbulent fluid flow, Continuity, Momentum and Energy equations and their applications; Flow measurement in channels, Flow in pipes, Pipe networks.  <b>Hydrology:</b> Hydrologic cycle, Rainfall, Evaporation, Infiltration, Unit Hydrographs; Irrigation, Duty, Delta, Crop water requirements; Gravity and Earth dams.</p>
<b>UNIT-II</b>	<p><b>Structural Engineering:</b>  <b>Concrete:</b> Concrete making materials and its properties; Mix design.  <b>Structural Mechanics:</b> Analysis of flexure, Torsion, Shear, Compression and Tension; Shear force and Bending moment diagram, combined and direct bending stresses.  <b>Concrete Structures:</b> Working stress and Limit state design concepts.  <b>Steel Structures:</b> Plastic analysis and Limit state design concepts.</p>
<b>UNIT-III</b>	<p><b>Environmental Engineering:</b>  <b>Water and Waste Water:</b> Water standards, Surface water treatment, Distribution of water; Sewage and Sewerage treatment; Primary, secondary and tertiary treatment of waste water, characteristics of wastewater; Effluent discharge standards.  <b>Air Pollution:</b> Types of pollutants, their sources and impacts, air pollution meteorology, air pollution control, air quality standards and limits.  <b>Municipal Solid Waste Management:</b> Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal).</p>
<b>UNIT-IV</b>	<p><b>Geotechnical Engineering :</b>  <b>Geotechnical:</b> Index properties of soil, soil structure, Permeability, Seepage analysis, Compaction and Consolidation and shear strength.  <b>Foundation:</b> Site explorations &amp; investigations, Methods of soil exploration, Terzaghi's bearing capacity analysis, Pile foundations, Pile group and its efficiency.</p>
<b>UNIT-V</b>	<p><b>Surveying, Remote Sensing and Geographical Information System</b>  <b>Surveying:</b> Principles of surveying.  <b>Remote Sensing:</b> Definition of RS, Benefits of RS over conventional method of surveying, Components of RS system.  <b>Geographical Information System:</b> Fundamentals and components of GIS, Application of RS and GIS in Civil engineering.</p>
<b>Text/References Books:</b>	
1.	Fluid Mechanics, Frank M. White, McGraw Hill publications
2.	Open Channel Flow, Hanif Chowdhary, Springer publications
3.	Mechanics of Solids, S. Crandall, N. Dahl and T. Lardner, McGraw-Hill publications
4.	Structural Analysis, Hibbeler R. C., Prentice Hall publications
5.	Wastewater Treatment and Reuse, Metcalf and Eddy, McGraw Hill publications
6.	Foundation Analysis and Design, Bowles JE(1996), McGraw Hill publications
7.	Advanced Soil Mechanics, Das. B. M(1997), Taylor and Francis publications
8.	Basics of Remote Sensing and GIS, Dr. S Kumar, Laxmi publications

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