

BHARATI VIDYAPEETH
(DEEMED TO BE UNIVERSITY), PUNE, INDIA
PhD Entrance Test – 2026
SECTION-II: Civil Engineering - 35 Marks

| Topics covered | |
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| UNIT-I | <p>Hydraulics Engineering : Hydraulics: 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. Hydrology: Hydrologic cycle, Rainfall, Evaporation, Infiltration, Unit Hydrographs; Irrigation, Duty, Delta, Crop water requirements; Gravity and Earth dams.</p> |
| UNIT-II | <p>Structural Engineering: Concrete: Concrete making materials and its properties; Mix design. Structural Mechanics: Analysis of flexure, Torsion, Shear, Compression and Tension; Shear force and Bending moment diagram, combined and direct bending stresses. Concrete Structures: Working stress and Limit state design concepts. Steel Structures: Plastic analysis and Limit state design concepts.</p> |
| UNIT-III | <p>Environmental Engineering: Water and Waste Water: 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. Air Pollution: Types of pollutants, their sources and impacts, air pollution meteorology, air pollution control, air quality standards and limits. Municipal Solid Waste Management: Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal).</p> |
| UNIT-IV | <p>Geotechnical Engineering : Geotechnical: Index properties of soil, soil structure, Permeability, Seepage analysis, Compaction and Consolidation and shear strength. Foundation: Site explorations & investigations, Methods of soil exploration, Terzaghi's bearing capacity analysis, Pile foundations, Pile group and its efficiency.</p> |
| UNIT-V | <p>Surveying, Remote Sensing and Geographical Information System Surveying: Principles of surveying. Remote Sensing: Definition of RS, Benefits of RS over conventional method of surveying, Components of RS system. Geographical Information System: Fundamentals and components of GIS, Application of RS and GIS in Civil engineering.</p> |

Text/References Books:

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| 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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