PGCET: 2025 – 26

Number of MCQ questions for PGCET is 100. Each question carry one mark.

Syllabus for PGCET in Civil Engineering

(1) Engineering Mathematics

(i)Linear Algebra: Matrices and determinants, rank of matrix, systems of linear equations, Eigen values and Eigen vectors.

(ii) Calculus: Limit, Continuity and differentiability, Partial derivatives, test for convergence, Fourier series.

(iii) Vector Calculus: Gradient, divergent and curl, line, surface and volume integrals. Stokes theorem, problems related to Gauss's and Green's theorem.

(iv) Differential Equations: Linear and nonlinear first order ODEs, higher order linear ODEs with constant coefficients, Cauchy's and Euler's equations.

(v) Partial Differential Equations: PDEs, formation of PDEs, solution of PDE by direct integration and separation of variables. Heat and wave equations.

(vi)Transforms: Laplace transforms, Fourier transform and Z – transform.

(vii) Probability and statistics: Mean, median, mode and standard deviation. Random variables, Poisson normal and binomial distributions, correlation and regression analysis.

(viii) Numerical Methods: Solutions of linear and nonlinear algebraic equations, integration of trapezoidal and Simpson's rule, Numerical solutions of ODEs.

(2) C Programming for problem solving

(i)Overview of C: Basic structure of C program, executing a C program, variable and data types, operators and expressions. Managing input and output operations, conditional branching and loops. Example programs. Finding rots of quadratic equation, computation of binomial coefficients, plotting of Pascal's triangle.

(ii)Arrays: Arrays (1D, 2D), character arrays and strings, basic algorithms, searching and sorting algorithms (linear search, bubble sort and selection sort).

(3) Technical English

(i) Introduction Listening Skills and Phonetics: Introduction to phonetics, sounds mispronounced, silent and non-silent letters, Homophones and homonyms, aspiration, pronunciation of "The" words ending with age. Use of articles – indefinite and definite articles.

(ii) Identifying Common Errors in writing and speaking English: Subject verb agreement (concord rules with exercises), common errors in subject verb agreement, noun-pronoun agreement. Adjective, adverb, verb, sequence of tenses, misplaced modifiers, Articles and prepositions, common errors in conjunctions. Gender, singular and plural.

(4)Elements of Civil Engineering and Strength of Materials

Force and its types, Concept of equilibrium, Building stones, Bricks, Cement and its properties, Timber and its properties, Columns and Struts, Stress and Mohr's circle ,Types of Beams, Bending moment and Shear force, Bending stress and Shear stress, Cylinders, Torsion.

(5)Building Engineering Science

Safe bearing capacity, Foundations, Types of Foundations, Footings and types, Cement and its types, Mortar, Reinforced Cement concrete, RMC- manufacture and requirement as per QCI-RMCPCS, High strength concrete, Types of roofs, Lintels and arches, Masonry, Staircase, Trusses, Formwork.

(6) Surveying

Chain surveying, Errors in surveying, Omitted measurements, Plane table Surveying, Levelling, Trigonometric surveying, Tacheometric surveying, Contouring, Curves, Calculation of areas and volume.

(7)Fluid Mechanics

Different types of fluids and units, pressure, buoyant force, Different types of Flows, Bernoulli's theorem, Discharge Measurements, Orifice, most economical section of the channel, Reynolds's and Froude's number, Modal studies, Pressure measuring devices; Notches and Weirs

(8)Structures

Three hinged arches and suspension cables. Deflection of beams by Macaulay's method, Moment area method and Conjugate beam method, Rolling loads and influence lines for determinate beams, Analysis of beams by consistent determination method and three moment theorem, Structural analysis by Slope deflection, Moment distribution and Kani's method. Beams; singly, doubly, flanged beams, Slabs; One-way, two way and flat Slabs, Stairs, Columns and column footings (isolated and combined footings), Raft foundation, Steel structures; Analysis and design of tension and Compression members, beams and beam column, column bases, Connections; simple and eccentric, plate girders and trusses, plastic analysis of beams and frames

(9) Geo-technical Engineering

Physical properties of soils, water in soils, Stress in soils, Consolidation and settlement, Shear strength of soils, Shallow foundations, Site investigation, Stability of slopes, Earth pressure.

(10) Water Supply and Sanitary Engineering

Water demand, Population forecast, Sources of water, Quality of water, Types of pipes, Types of pumps, Water treatment units; sedimentation, aeration, flocculation, filtration, Screening, Pipe joints, Conveyance of Water, Quantity of sewage, Characteristics of Sewage, pH, BOD, COD, DO and others, Sewers, Sewer Appurtenances, Biological treatment, Sewage treatment units; screening, Grit chamber, Skimming tanks, Detritus tank, Trickling filter, Contact beds, Septic tank, Imhoff tank, ASP, Sewage disposal units, Advance water treatment and waste water treatment methods.

(11) Transportation Engineering:

Highway Geometric Design: Highway cross-section elements, Sight distance, Design of Horizontal alignment, Design of Vertical alignment. Traffic Engineering: Traffic characteristics, Traffic operation, Pavement materials, Design and evaluation, Rail Gage, Train Resistance, Power of Locomotive, Rails, Sleepers, Curvature of Track, Tunnelling of soft soil, Transition curve, Harbour and Dock.

(12) Hydrology:

Hydrologic cycle, rainfall, unit hydrograph, flood estimation, reservoir design, Well hydraulics.

(13) Irrigation:

Duty, Delta, Crop water requirements, design of lined and unlined canals, head work, gravity dams and ogee spillways, irrigation methods.