PGCET: 2025 – 26

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

Common Syllabus for PGCET of Mechanical Stream consisting of

ME/AE/IEM/IPE/MSE

[(i) Mechanical Engineering (ME), (ii) Automobile Engineering (AE), (iii) Industrial Engineering and Management (IEM), (iv) Industrial Production Engineering (IPE) and (v) Manufacture Science Engineering (MSE)]

(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) Engineering Materials

(i) Structure and properties of engineering materials. Heat treatment, composite materials and their applications.

(5) Engineering Mechanics

(i)Free body concepts, equations of equilibrium. Centroids and moment of inertia.

(6) Strength of Materials

(i) Stress and strain, elastic constants. Principal stresses, maximum shear stress. Theories of failure, shear force and bending moment diagrams, shear and bending stresses in beams, deflection in beams, torsion, columns.

(7) Fluid Mechanics

(i)Fluid properties, fluid statics, manometry, buoyancy. Conservation laws. Euler's equation, Bernoulli's equation, viscous flow of incompressible fluids. Laminar and turbulent flows, flow through pipes, dimensional analysis.

(8)Thermodynamics

Laws of thermodynamics, internal energy, enthalpy and entropy, Thermodynamic processes, Heat and work, Irreversibility and availability, perfect gas, properties of pure substances, Air standard and fuel air cycles, IC engines and Gas turbines, centrifugal and axial flow compressors.

(9) Theory of machines

Analysis of planar mechanisms, Dynamic analysis of Slider-Crank mechanism, Cams and followers, Kinematics of Gears, Governors and flywheels, balancing of reciprocating and rotating masses, Free and Forced vibrations of single degree freedom systems, Effect of damping, Transmissibility, Vibration Isolation, Critical speed of shafts.

(10) Design of Machine Elements

Material and manufacturing considerations, Design of Shafts, keys, couplings, bolted, riveted and welded joints, Dynamic loads, Design of power screws, helical springs, Spur gears, clutches and brakes, Hydro-dynamic lubrication, Journal bearings and anti-friction bearings

(11) Production Engineering

Metal casting processes, Melting and Pouring of cast iron, Ferrous and non-ferrous metals and alloys, casting defects, Inspection of castings, Hot and Cold working of metals, Metal joining processes: Soldering, brazing and welding, modem welding processes; Metal cutting tools - machine tool operations, Non-traditional machining processes.

(12) Industrial Engineering and Management

Introduction to work study and method study. Principles of organization, types of organizations, types of ownership, functions of personnel management, functions of sales management. Materials management, inventory control, value analysis, scheduling & production control, PERT and CPM.