ಕರ್ನಾಟಕ ಪರೀಕ್ಷಾ ಪ್ರಾಧಿಕಾರ
Karnataka Examinations Authority

PGCET: 2025 – 26

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

Common Syllabus for PGCET to Electrical Stream consisting of

EEE/ECE/EIE/TCE/BME/ML

[(i) Electrical and Electronics Engineering (EE), (ii) Electronica and Communication Engineering (ECE), (iii) Telecommunication Engineering (TCE), (iv) Electronic Instrumentation Engineering (EIE), (v) Biomedical Engineering (BME) and (vi) Medical Electronics (ML)]

(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) Electric Circuits

(i) Network Topology: Graph of network, concept of tree, links, tie set schedule, cutset schedule.

(ii) Circuit Concepts: Source transformation, circuit analysis using loop current and node voltage methods, star-delta conversion, concept of controlled sources, Network theorems: Thevenin's, Norton, maximum power transfer, superposition and reciprocity theorems. Resonant circuits. Transient analysis. Laplace transformations and applications. Standard signals, initial conditions.

(iii) Two – port Network: y, z and h parameters of two –port networks.

(5) Analog and Digital Electronics

(a) Analog Electronics:

(i) Diode circuits, Rectifiers, Transistor biasing and bias stability. Small signal h-parameter equivalent circuit of transistor. Expression for current gain, voltage gain and input impedance. RC coupled amplifier, frequency response, half power frequencies, bandwidth and factors influencing the bandwidth. RC coupled emitter follower, current gain, voltage gain, input and output impedances, FET – RC coupled amplifier. Class A, B, push pull and class C power amplifiers, maximum power output, driving power requirements.

(ii) Feedback amplifiers and oscillators: Concept of positive and negative feedback, advantages of negative feedback, voltage and current feedback, effect of the same on performance characteristics, condition for oscillation, Wien bridge oscillator, expression for frequency of oscillation, crystal oscillator . Voltage regulator, operational amplifiers, comparators. ZCD, Precision rectifier, I to V and V to I converters, instrumentation amplifiers, square wave, triangular wave and saw tooth wave generators.

(iii) Clipping, clamping, integrator and differentiator circuits.

(b) Digital Electronics

(i) Number systems and codes: Decimal, binary, octal, hexadecimal, binary coded decimal, octal number, excess 3 and gray codes, binary arithmetic.

(ii) Combinational Logic Circuits: Digital signals, Boolean constants and variables, basic logic operations, AND, OR, NOR gates and realization or truth tables. Boolean expressions, simplification of Boolean expressions using basic theorems, Karnaugh map method of obtaining logic expressions, maxterm, minterm realization of logic functions using basic gates and also using NAND and NOR gates. Half adder, full adder, multiplexers, demultiplexers, encoders and decoders, A/D and D/A converters.

(iii) Sequential Circuits: SR latch, clocked RS FF, D FF, JK and T FF, master slave JK FF, edge triggered FFs, registers, shift registers, asynchronous counters, synchronous counters.

(6) Control Systems

(i) Basic controls system concepts, transfer function, block diagram reduction, signal flow graph. Time and frequency domain analysis.

(ii) Stability: Absolute and relative stability, RH criterion, polar plots, phase crossover and gain crossover frequencies. Bode plots, phase plot and gain plot, determination of gain and phase margins.

(iii) Nyquist Stability Criterion: Principle of mapping of Nyquist path, gain margin, phase margin, Nyquist stability criterion, root locus.

(iv) State space technique: State variable, state model of linear systems, solution of state equations, state transition matrix.

(7) Signals and Systems and Digital Signal Processing

(i) Signals and Systems and DSP: Types of signals and systems, properties of systems, convolution, correlation, Fourier series and transforms (Discrete Time), Z-transform, DFT and FFT, Structure for FIR and IIR system, Windowing techniques, Analog and digital filter design, FIR and IIR filter design.

(8) Microcontroller

(i)8051 Microcontroller Basics: Inside the Computer, Microcontrollers and Embedded Processors, Block Diagram of 8051, PSW and Flag Bits, 8051 Register Banks and Stack, Internal Memory Organization of 8051, IO Port Usage in 8051, Types of Special Function Registers and their uses in 8051, Pins Of 8051. Memory Address Decoding, 8031/51 Interfacing with External ROM And RAM.8051 Addressing Modes.

(ii)Assembly Programming and Instruction of 8051: Introduction to 8051 assembly programming, Assembling and running an 8051 program, Data types and Assembler directives, Arithmetic, logic instructions and programs, Jump, loop and call instructions, IO port programming.