

Medi-Caps University

Syllabus for Ph. D. Entrance Exam in Electrical Engineering

Sinusoidal steady-state analysis, Resonance, Transient and steady state analysis, Thevenin's theorem, Norton's theorem, Superposition theorem, Maximum power transfer theorem, Two-port networks, Applications of Fourier Transform, Laplace Transform

Theory of Transformer, D.C. Machine, Induction motor, Synchronous motor and their characteristics.

Models and performance of transmission lines and cables, Series and shunt compensation, Electric field distribution and insulators, Distribution systems, Per-unit quantities, Bus admittance matrix, load flow methods, Voltage and Frequency control, Symmetrical and unsymmetrical fault analysis, Principles of over-current, differential and distance protection; Circuit breakers, System stability concepts, Equal area criterion, voltage stability, power system security.

Transient and Steady-state analysis of linear time invariant systems, Routh-Hurwitz and Nyquist criteria, Bode plots, Root loci, Stability analysis, Lag, Lead and Lead-Lag compensators; P, PI and PID controllers; State space model, State transition matrix.

Buck, Boost and Buck-Boost converters; Single and three phase configuration of uncontrolled rectifiers, Line commutated thyristor based converters, Bidirectional ac to dc voltage source converters, Single phase and three phase inverters, Sinusoidal pulse width modulation.

Solar energy system, photovoltaic system and their characteristics, wind energy system and their characteristics.