

# *Syllabus for Electrical Engineering Bachelor's*

## Section 1: Subject Knowledge

Please Note: A Total of 40 Questions will be asked, combining the following topics, with the difficulty level commensurate to a Bachelor's Candidate.

### Unit I: Engineering Mathematics

Linear Algebra, Calculus, Differential equations, Complex variables, Probability and Statistics.

### Unit II: Electric circuits

Network elements, Network solution methods, Network Theorems, Transient response of dc and ac networks, sinusoidal steady-state analysis, resonance, two-port networks, balanced three-phase circuits, star-delta transformation, complex power and power factor in AC circuits.

### Unit III: Electromagnetic Fields

Electrostats, Magnetostats, Self and Mutual inductance of simple configurations.

### Unit IV: Signals and Systems

Continuous and discrete-time signals, shifting and scaling properties, linear time-invariant and causal systems, Fourier series representation of signals, sampling theorem, Fourier Transform for signals, Laplace Transform, Z transform, R.M.S value, average value calculation for periodic waveform.

### Unit V: Electrical Machines

Single-phase transformers, DC machines, Three-phase induction machines, Synchronous machines.

### Unit VI: Power Systems

Power generation, transmission, distribution, control, fault analysis, protection, and stability.

### Unit VII: Control Systems

Modeling, feedback, transfer functions, analysis, stability, compensators, controllers, and state-space representation.

## Unit VIII: Electrical and Electronic Measurements

Bridges and Potentiometers, Measurement of voltage, current, power, energy and power factor, Instrument transformers, Digital voltmeters and multi-meters, Phase, Time and Frequency measurement, Oscilloscopes, Error analysis.

## Unit IX: Analog and Digital Electronics

Simple diode circuits, operational amplifiers, characteristics and applications, Active Filters.

## Unit X: Power Electronics

Static V-I characteristics and firing/gating circuits for Thyristor, MOSFET, IGBT, AC to DC conversion.

### **Section 2: Fundamental Skills**

Please Note: A Total of 28 Questions will be asked, combining the following topics, with the difficulty level commensurate to a Bachelor's Candidate.

Unit I: Data Analysis

Unit II: Math and Statistics

Unit III: Critical Reasoning and Aptitude

Unit IV: Reading and Writing

### **Section 3: Specific Skill Proficiency**

This section has multiple skills. You can select the ones you are proficient in from the enrollment form. You can select a maximum of 2 skills.