

SYLLABUS
JUNIOR LAB ASSISTANT (ELECTRICAL ENGINEERING)

- DC circuits and transients-Network terminology and types of energy sources KVL KCL laws, Mesh analysis, Node analysis, Superposition theorems, Thevenin and Norton theorem Maximum power transfer theorem Charging and discharging a capacitor, time constant and transient curve of RC circuit
- Single phase AC circuits, network theorems-Phasor representation of alternating quantities, phasor diagram, Series RL and RC circuits Series RLC circuit
- Three phase AC circuits and Magnetically coupled circuits - Generation of 3-phase voltages, Star and delta connections
- Transformers and Basic Machines: Ideal transformer, Practical transformer. Introduction to rotating Machines, Principles of DC and AC machines
- Basic Electronics: Semiconductor Diode I-V characteristics of Diode, Half-Wave and Full-Wave Rectifier Circuits, Clippers and Clampers, Bipolar Junction Transistor Biasing, Small Signal model, and Amplifiers. Op-amp Circuits Amplifiers, summers, differentiators, integrators
- Digital Circuits: Number Representations: binary, integer and floating-point numbers. Combinatorial circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaugh map, logic gates, code converters, multiplexers, decoders
- Signals and Systems: Continuous-time signals: Fourier series and Fourier transform representations, sampling theorem and applications; LTI systems: definition and properties. causality, stability, impulse response, convolution, frequency response.
- Analog communications: amplitude modulation and demodulation, angle modulation and demodulation, superheterodyne receivers, circuits for analog communications: Digital communications: Phase and frequency shift keying (ASK, PSK, FSK), Experimental knowledge of the above topics would also be tested.
- Basic Computer Knowledge: computer office applications, MS Word, Excel, Power-point. Software Installation, The Hardware of Computers, Internet, basic commands.
- Electronic circuits: Handling and operating electrical/electronic instruments and equipment's, building, testing and debugging of electrical/electronic circuit and systems
- Signal Processing and Communications implementing simple signal processing/communication related functions in MATLAB, and Electrical machines and power engineering.
- General English, Quantitative Aptitude, Analytical Reasoning & General Knowledge / Current Affairs.