

Laboratory Assistant (Contractual) in Center for Advance Defence Technology

Syllabus for Screening Test (MCQ type 50 Questions - 1 hour)

Circuit analysis: Node and mesh analysis, superposition, Thevenin's theorem, Norton's theorem, reciprocity. Sinusoidal steady state analysis: phasors, complex power, maximum power transfer. Time and frequency domain analysis of linear circuits: RL, RC and RLC circuits.

Signals and Systems: Fourier series and Fourier transform, sampling theorem and applications. DTFT, DFT, z-transform, discrete-time processing of continuous-time signals. LTI systems

Electronic Devices: P-N junction, Zener diode, BJT, MOS capacitor, MOSFET, LED, photo diode and solar cell

Analog and Digital Circuits: Diode circuits, BJT and MOSFET amplifiers, Op-amp circuits, Number representations, Sequential circuits, Data converters, Semiconductor memories, Computer organization

Control Systems: Basic control system components; Feedback principle; Transfer function, State Space Analysis, Stability

Power Electronics: Static V-I characteristics and firing/gating circuits for Thyristor, MOSFET, IGBT, DC to DC converters, Inverters

In addition to the above topics, the candidate can opt for one of the following topics:

Electrical Machines and Power Systems: Basic concepts of electrical power generation, Single phase transformer, Single-Phase and Three-phase induction machines, Power factor, Transmission and distribution system

Or

Analog and Digital communications: amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, super heterodyne receivers, PCM, DPCM, digital modulation schemes (ASK, PSK, FSK, QAM), bandwidth, inter-symbol interference, MAP, ML detection, matched filter receiver, SNR and BER. Fundamentals of error Syllabus for Written Test PhD Admission Autumn Semester (2023-24) Page 7 of 12 correction, Hamming codes, CRC