

**Subject Concerned Syllabus
Electronic (Ph.D.)**

PART B

Unit—I

Electronic Transport in semiconductors, PN Junction, Diode equation and diode equivalent circuit, Breakdown in diode. Zener diode, Tunnel diode, characteristics and equivalent circuits of BJT, JFET, MOSFET, Fabrication of Semiconductor devices and ICs.

Unit—II

SMPS, UPS, inverters, converters, Biasing of Bipolar junction transistors and JFET. Single stage amplifiers, Multistage amplifiers. Feedback in amplifiers, oscillators, function generators, multi vibrators, Operational Amplifiers (OPAMP)-characteristics and Applications, Computational Applications, Integrator, Differentiator, Wave-shaping circuits, F to V and V to F converters. Active filters, Schmitt trigger, Phase locked loop.

Unit—III

Logic families, flip-flops, Gates, Boolean algebra and minimization techniques, multiplexers and de multiplexers, Arithmetic circuits, Multivibrators and clock circuits, Counters-Ring, Ripple, Synchronous, Asynchronous, Up and down, shift registers, Memories, A/D and D/A converters.

Unit—IV

Microprocessors and Microcontrollers: Architecture of 8085 and 8086 Microprocessors, Addressing modes, 8085 instruction set, 8085 interrupts Programming, Memory and I/O interfacing. Interfacing of 8155, 8255, 8279, 8253, 8257, 8259, 8251 with 8085 Microprocessors. Serial Communication Protocols.

Unit—V

Maxwell's equations, Time varying fields, Wave equation and its solution, Rectangular waveguide, Poynting vector, Antenna parameters, Half-wave antenna, Transmission lines. Characteristic Impedance, Impedance matching, Smith chart.

Unit—VI

Basic principles of amplitude, frequency and phase modulation, Demodulation, Intermediate frequency and principle of superheterodyne receiver, Spectral analysis and signal transmission through linear systems, Random signals and noise, Noise temperature and noise figure. Basic concepts of information theory, Digital modulation and Demodulation PM, PCM, ASK, FSK, PSK, Time-division Multiplexing, Frequency-Division Multiplexing, Data Communications-Circuits, line Codes, error detection and correction codes, GSM, GPRS and Modems.

Unit—VII

Optical sources-LED, Spontaneous emission, Stimulated emission, Semiconductor Diode LASER, Photodetectors-p-n photodiode, PIN photodiode, Phototransistors, Optocouplers, Solar cells, Display devices. Optical Fibres-Light propagation in fibre, Types of fibre, Characteristic parameters, Modes, Fibre splicing and connectors, Fibre optic communication system-coupling to and from the fibre, Modulation, Multiplexing and coding, Repeaters, Bandwidth and Rise time budgets.

P. Kumar

H. L. L.

Unit—VIII

Programming in C: Elements of C –Tokens, identifiers, data types in C. Control structures in C. Sequence, selection and iterations. Structured data types in C- arrays, struct, union, string, pointers. File handling in C.

UNIT-IX

Signals and Systems: Linear time invariant systems: impulse response, transfer function and frequency response of first- and second order systems, convolution. Random signals and noise: probability, random variables, probability density function, autocorrelation, power spectral density. Sampling theorem, Discrete-time systems: impulse and frequency response, IIR and FIR filters.