

**Gujarat University
Ahmedabad**

B. Sc. Semester - II

Electronics : ELE - 103

Unit-I: Transistors:

Bipolar Junction transistor, operation of PNP and NPN transistor, current components in transistor, transistor as an amplifier, transistor circuit configuration, CB, CE, and CC configuration, characteristic of common base and common emitter circuit, DC load line.

Transistor Biasing: Stabilization, stability factor, different method for transistor biasing, base resistor method, collector to base bias, base bias with collector emitter feedback, voltage divider bias, bias compensation.

Text Book: Electronic Devices and Circuits by Sanjeev Gupta (6.1 to 6.12, 10.1 to 10.9)

Reference Book: Electronic Devices and Circuits by Allen Mottershead

Basic Electronics and Linear Circuits by Bhargav, kulshrestha and Gupta, TMH

Millman's Integrated Electronics Millman Halkias and Parikh

Unit-II: Four Terminal Active Network:

Transistor as a four pole, Impedance parameters or Z- parameters, Admittance parameters or Y-parameters, Hybrid parameters or h-parameters, Performance of a linear circuit in h-parameters, Voltage gain current gain and output impedance taking into account the source resistance (R_s).

Small signal amplifiers: practical circuit of transistor amplifier, load line analysis, calculation of gain, phase reversal, Simplified CE hybrid model, generalized approximate model, classification of amplifiers, common emitter CE amplifier, Analysis of transistor amplifier using h-parameters, (common base CB amplifier and common collector CC amplifier without h-parameter analysis), comparison of CE, CB, and CC amplifiers.

Text Book: Electronic Devices and Circuits by Sanjeev Gupta (9.1 to 9.6., 11.1 to 11.4., 11.6 to 11.13)

Reference Books: Electronic Devices and Circuits by Allen Mottershead

Basic Electronics and Linear Circuits by Bhargav, kulshrestha and Gupta, TMH

Millman's Integrated Electronics Millman Halkias and Parikh

Unit-III: Network transformations:

Reduction of complicated network, conversion between T and π sections, bridge T network, the lattice network, superposition theorem, the reciprocity theorem, thevenin's theorem, Norton theorem, maximum power transfer theorem, compensation theorem.

Resonance : Definition of Q, the figure of merit, series resonance, Bandwidth of the series resonant circuit, parallel resonance or antiresonance, current in antiresonant circuits, Bandwidth of antiresonant circuits.

Text Book: Network Lines and Field by J D Ryder. (1.4 to 1.13, 2.1 to 2.4, 2.6, 2.8)

Reference Books: Network Analysis by M. S. Van Valkenburg

Network Analysis by G K Mithal

Unit-IV: Digital Electronics:

Combinational logic Circuits: sum of products method, truth table of karnaugh map, pairs, quads and octets, karnaugh simplifications, Don't care conditions, product of sums method, product of sums simplification, Simplification by quine-McClusky method.

Data processing circuits: Multiplexers, demultiplexers, 1-of-16 decoder, BCD-to-decimal decoders, seven segment decoders, encoders, exclusive-or GATES, parity generators and checkers, read only memory.

Text Book: Digital Principles and applications 6th Edition Malvino Leach and Saha
(3.2 to 3.9, 4.1 to 4.8, 4.10)

Reference Books: Digital Fundamentals by Floyd , Pearson
Digital Design Morrisand Mano PHI

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Electronics Practicals : ELE – 104

Group-I:

The practical of common base characteristics is to be replaced by Study of maximum power transfer theorem.

Group-II:

The practical BCD to binary and binary to BCD code conversion is to be replaced by Study of truth tables of 2,3 and 4 input Ex-OR gate and its uses as parity checker and controlled inverter.

All other experiments remain as it is.
In each group there are seven experiments.