

SEMESTER II – PAPER IV – SOLID STATE DEVICES

UNIT I – THYRISTORS

Thyristor family – SCR – Theory of operation – Characteristics and ratings – Applications switching and motor control – logic Circuit – TRIAC – Theory and operation – Characteristics, ratings and nomenclature – triggering and turn-off methods.

UNIT II – UNIJUNCTION TRANSISTORS

Introduction – Basic theory of operation – Nomenclature, Characteristics and structure – The UJT relaxation Oscillator – Complementary Unijunction transistors (CUJTS) – Programmable Unijunction transistors (PUTS) – Comparisons of UJTS

UNIT III – OPTOELECTRONICS

LED's – Theory – simple radiometric instrument – calibration circuit using LET – Elementary theory of lasers – Photodiodes and photo transistors – Photo voltaic cells – LCD display – photo FET – Photo thyristors – infrared and Ultraviolet detectors.

UNIT IV – SIGNAL GENERATORS

Sine wave Oscillator – Wien Bridge Oscillator – Monolithic Multivibrator – 555 timer in Astable – Monostable Mode – Timer / Counter circuits – Voltage controlled Triangular/Square wave Generator – Saw tooth wave form Generators – Voltage – to Frequency, Frequency to Voltage converters.

UNIT V – VOLTAGE REGULATORS

Basic configurations of Voltage regulators – Zener Diode, Bandgap Voltage references – Three terminal Fixed and adjustable voltage regulators – Three and four terminal adjustable regulators. Negative Voltage regulators – Special purpose regulators.

BOOKS FOR STUDY

- 1) Integrated circuits and semiconductors devices: theory and applications, Gordon J. Deboo and Clifford N. Burrous. McGraw – Hill International Editions, 1977.
Unit I – Chapters 8
Unit II – Chapter 9.5
Unit III- Chapters 6 & 7
- 2) Integrated Circuits K.R.Botkar – Khanna Publishers – Delhi – 110 006, 1997
Unit-IV Chapter 12.1.1, 12.3.1, 12.3.2, 12.3.3, 12.3.7, 12.4, 12.6, 12.8.1, 12.8.2
Unit –V- Chapter 13.1, 13.2, 13.3, 13.6, 13.7, 13.9