PAPER - II SEMICONDUCTOR DEVICES AND IC FABRICATION

UNIT 1: FIELD EFFECT TRANSISTORS :

JFET - Pinch - off voltage - volt-ampere characteristics - small signal model - MOSFET enhancement and depletion types - Drain characteristics - Transfer Characteristics - MOSFET gate protection - low frequency common- source and common drain amplifiers - Biasing the FET - high frequency analysis of CS & CD amplifiers - digital MOSEET. Circuits - MOSFET invertors - MOSFET Logic gates - NAND and NOR - CMOS.

UNIT 2: THYRISTORS :

Thyristor family - SCR - TRIAC - DIAC - Theory of operation - Characteristics and ratings - Applications Switch and motor control.

UNIT 3: NEGATIVE RESISTANCE DEVICES :

UJT as astable, monostable and bistable multivibrators - UJT Thyristor trigger Circuits Complementary UJTS, Programmable UJTS - Tunnel diode as an amplifier - Tunneldiode as oscillator - Tunnel diode as astable, monostable and bistable multivibrators.

UNIT 4: OPTO ELECTRONIC DEVICES :

Light emitting diodes - gas and Ruby lasers semiconducting injection lasers - LED Display Liquid Crystal displays - Photoresistors - Photo diodes - Solar cells - Photo Transistors - infrared detectors Ultra violet detectors.

Special Diodes : Zener diodes - voltage variable capacitance diodes - schottky diodes - pindiode - Gunn diode - spacistor Thermistor.

UNIT 5: INTEGRATED CIRCUITS - FABRICATION AND CHARACTERISTICS :

IC technology - basic monolithic ICs epitaxial growth - masking and etching - diffusion of impurities - transistors for monolithic circuits - monolithic diodes - integrated resistors capacitors and inductors monolithic - circuit layout - isolation methods - LSI and MSI - metal semiconductor contact.

BOOKS FOR STUDY :

1. Integrated electronics by Jacob Millman and Christors C. Halkias - McGraw Hill.
2. Micro Electronics by Jacob Millman McGraw Hill.
3. Integrated Circuits and Semiconductor Devices Gordon J Deboo and Clifford N. Burrous McGraw Hill.
4. Physics of Semiconductor Devices by S.M.Sze.

REFERENCES :

1. Electronic Devices and Circuits by G.K. Mittal Khannan publishers.
2. Solid State Electronics Circuits by Antony S. Manera - McGraw Hill.
3. Electronic Circuits - Descrete and Integrated by Donald l. Schilling and Charles below McGraw Hill.