

POWER ELECTRONICS

Code : EE 701(EI)

Credits : 4

Module I

Power Semiconductor Devices: Rectifier diodes, fast recovery diode and Schottky barrier diode. Power BJT and power Darlington transistors, Power MOSFET. The thyristor family: SCR, triac, inverter-grade SCR, asymmetric SCR, reverse-conducting thyristor (RCT) and gate turn-off thyristor (GTO). SCR turn-on and turn-off methods. Insulated gate bipolar transistor (IGBT).

Common triggering devices and their applications: UJT, diac and PUT.

Module II

Converters :

(a) Rectifiers:

Single phase and three phase uncontrolled bridge rectifiers with inductive load / RL load, free wheeling diodes

Single phase and three phase controlled bridge rectifiers with inductive load / RL load, free wheeling diodes

(b) DC to DC converters (Choppers) : principle of step up and step down converters with R / RL load

(c) DC to AC converters (inverters) : Single phase and three phase inverters

Module III

Converters (contd.)

(d) Cycloconverters : Single phase and three phase circuits, blocked group operation, circulating current mode

(e) Converter operation : Overlap, power factor, inversion, regulation, P-pulse converters

Module IV

DC line commutation : parallel capacitor turn off, resonant turn off (series), impulse commutation

Applications : DC and AC drives, Speed controller of DC and AC motors, Power supplies – Switched mode, uninterrupted type.