

20PE016 - POWER SEMICONDUCTOR DEVICES AND PASSIVE COMPONENTS

UNIT - I

L- 10

Power semi-conductor devices : Structure, operation and characteristics of SCR, TRIAC, power transistor, MOSFET, IGBT and GTO-turn on and turn off characteristics – protection schemes, Triggering and commutation of SCR.

UNIT - II

L- 10

Phase-controlled converters : 2- pulse, 3-pulse, 6-pulse and dual converters- inverter operation of fully controlled converter – effect of source inductance – distortion and displacement factor – ripple factor.

UNIT - III

L- 09

Choppers : Step-down and step-up choppers – time ratio and current limit control –Voltage commutated, current commutated and load commutated choppers, switching mode regulators –buck, boost, buck-boost converter.

UNIT - IV

L- 08

Inverters : Classification of inverters – single phase, three phase inverters– series inverter – parallel inverter –voltage control of single phase, three phase inverters – current source inverters, harmonic reduction in inverters, Multilevel inverter.

UNIT - V

L- 08

AC to AC converters : Single phase AC regulators – sequence control of AC regulators – three phase AC regulators – single phase to single phase cyclo converter – three phase half wave cyclo converter – control circuit output voltage equation.

TEXT BOOKS:

1. Dr.P.S.Bimbira, “Power Electronics” 4th ed., Khanna publishers, 2009.
2. M.D. Singh & K.B Khanchandani, “Power Electronics”, 2nd ed., Tata MC Graw Hill, 2009.

REFERENCES:

1. Vedam Subrahmanyam, “Power Electronics”, 1st ed., New Age, 2001.
2. Ned mohan, “Power Electronics”, 2nd ed., Wiley, 1995.
3. C.W Lander, “Power Electronics”, 3rd ed., MCGraw Hill, 1993.
4. M.H.Rashid, “Power Electronics: Circuits, Devices and Applications”, 3rd ed., Prentice Hall of India, 2009.