

(EE503) ANALYSIS OF POWER ELECTRONIC CONVERTERS

Objective of the Course :

With the advent of semiconductor devices, revolution is taking place in the power transmissions, distribution and utilization. This course introduces the basic concepts of converters, choppers, inverters and their analysis.

UNIT - I

Unsymmetrical bending and Shear Centre :

Introduction– Half controlled and Fully controlled converters –harmonic analysis —power factor Improvement -single phase series converters – Numerical problems. Three phase converters – Half controlled and fully controlled converters –harmonic analysis — power factor Improvement – - twelve pulse converter – dual converters – Numerical problems.

UNIT - II

Three phase AC voltage controllers and cyclo Converters:

Three phase AC voltage controllers – Analysis of controllers with star and delta Connected loads–applications–numerical problems. Three phase to three phase cycloconverters – analysis of Midpoint and bridge configurations – Limitations – Advantages – Applications -numerical problems.

UNIT - III

D.C. to D.C. Converters:

Switched mode regulators–analysis of Buck ,Boost , buck-boost and Cuk regulators– comparison- Numerical problems- d.c to d.c converters with isolation- fly back, forward, push pull and half bridge configurations- comparison – applications –Numerical problems.

UNIT - IV

Pulse Width Modulated Inverters(three phase:

Three phase inverters – analysis of 180 degree 120 degree Conduction modes – voltage control of three phase inverters – sinusoidal PWM – Third Harmonic PWM – 60 degree PWM – space vector modulation – Comparison of PWM techniques –Current Source Inverter – variable d.c.

UNIT - V

Resonant Converters:

Resonant Converters- Zero current switching (ZCS) d.c to d.c converter - zero voltage switching(ZVS) d.c to d.c converter- clamped voltage (ZVS-CV)- applications –Numerical problems

REFERENCE BOOKS:

1. Mohammed H. Rashid, "Power Electronics", 3rd ed., Pearson Education, First Indian reprint 2004.
2. Ned Mohan, Tore M. Undeland and William P. Robbins, "Power Electronics" 2nd ed., John Wiley & Sons