ANALYSIS OF POWER ELECTRONIC CONVERTERS-II

Course Code: 13EE2210  L  P  C  4  0  3

Pre requisites: Power Electronics

Course Outcomes: At the end of the course, the students will be able to
CO1: Analyze resonant converters – Zero voltage and zero current
switching converters.
CO2: Analyze DC power supplies with high frequency link.
CO3: Explain Power conditioners and Uninterruptible power supplies.
CO4: Describe the Principle of SPWM & space vector PWM
CO5: Explain the Concept of current harmonics and their adverse
effects.

UNIT-I
RESONANT CONVERTERS:
Introduction, Switch mode inductive current switching, zero voltage and
zero current switchings, Classification of resonant converters-load
resonant converters-resonant switch converters-resonant dc link
converters. Basic resonant circuit concepts-series resonant circuits-
parallel resonant circuits. Load resonant converters-series loaded
resonant dc-dc converters-parallel loaded resonant dc-dc converters.
Resonant switch converters-ZCS resonant switch converters-ZVS
resonant converters, Comparison of ZCS and ZVS topology.

UNIT-II
SWITCHING DC POWER SUPPLIES:
Introduction, Linear power supplies, overview of switching power
supplies, Flyback converters (derived from buck-boost
converters), forward converter (derived from step-down converter),
push-pull converter (derived from step-down converter). Half bridge
converter (derived from step down converter), full bridge converter
(derived from step down converter), current source dc-dc converters.
UNIT-III
POWER CONDITIONERS AND UNINTERRUPTIBLE POWER SUPPLIES:
Introduction, Power line disturbances-types of disturbances-sources of disturbances-effect of sensitive equipment, power conditioners, UPSs-rectifiers-batteries-Inverters-static transfer switch.

UNIT-IV
SPACE VECTOR PWM:
Principle of PWM, Principle of space vector PWM, converter switching states, linear or under modulation region, over modulation region, implementation steps.

UNIT-V
OPTIMIZING THE UTILITY INTERFACE WITH POWER ELECTRONIC SYSTEMS:
Introduction, generation of current harmonics, current harmonics and power factor, harmonic standards and recommended practices, need for improved utility interface, improved single phase utility interface, improved three phase utility interface, electromagnetic interference.

TEXT BOOKS:

REFERENCE BOOKS: