Rashtrasant Tukadoji Maharaj Nagpur University, Maharashtra B.E./B.Tech CSE Sem 2 syllabus

Advanced Electrical Engineering

Advanced Electrical Engineering (BESII-5)

Total Credits: 03

Unit – I : Introduction to Electrical Power System :
Introduction to Power Generation (Thermal, Hydro, Nuclear, Wind, and Solar) with block schematic presentation only. Single line diagram for Generation, Transmission & Distribution through different voltage levels; Low voltage distribution system (Over head & Underground, single phase & three phase)
Necessity of equipment earthings, Fuses (Rewirable & HRC), MCB, ELCB (Elementary concepts only), Basic operation of UPS & Invertors (Block schematic representation).

Unit – II :DC Machines
Construction of a D.C Machine (without details of armature winding), Principle of working as a generator and as a motor, EMF equation of a DC machine, types of DC machines.
Concept of Back EMF, speed and torque equations, characteristics of motors, necessity of starters, Applications of DC motors.

Unit – III :Utilization of Electrical Energy Tariff
One part (KWH based) tariff with simple numerical: Students should be able to calculate the domestic electricity charges.
Illumination:
Definitions of luminous flux, luminous intensity, candle power, illumination, luminance, luminous efficiency (lumens/watt) of different types of lamps, working principle of Fluorescent/ Sodium Vapour/ Mercury vapour & CFL Lamps. Simple numerical to determine number of lamps to attain a given average lux level in an area.

Unit – IV :AC motor

Three-phase Induction Motors : Working principle, types & constructions of three phase Induction Motor, synchronous speed, torque, slip, torque -speed characteristic, application (No numerical).
Single Phase Induction Motor: Types of single phase Induction motors, operating principle and their applications.

Books Recommended:
1) Basic Electrical Engineering, S.N. Singh, PHI, Learning Private Limited.
2) A Text Book Of Electrical Technology, B. L. Tharaja and A. K. Tharaja, S. Chand Publication (Volume II & III)
3) Electrical Machines M. N. Bandyopadhya, PHI, Learning Private Limited.
4) Electrical Machines, Ashfaq Husain, Dhanpatrai Company, 4th edition.
5) Basic Electrical Engineering, D.C. Kulshreshtha, revised 1st edition, Tata Mc-Graw Hill education pvt. Ltd.
6) Generation of Electrical Energy- B. R. Gupta 4th Edition S Chand Publication
7) Testing Commissioning Operation & Maintenance Of Electrical Equipment – S. Rao Khanna Publication