

SARDAR PATEL UNIVERSITY
Programme: B.Sc
Semester: II
Syllabus with effect from: November-2011

Paper Code: US02CPHY02	Total Credit: 2
Title of Paper: Electronics, Nuclear & Modern Physics	

Unit	Description in detail	Weightage (%)
I	Electronics - I V-I characteristics of a PN junction diode DC power supply: Use of diodes in rectifiers, Half wave rectifier, Full wave rectifier, Ripple factor and rectification efficiency, Performance of half wave rectifier, Performance of full wave rectifier. Filters: How to get better DC, Shunt capacitor filter, Series inductor filter, Choke - input LC filter, The CLC or PI filter	25%
II	Electronics – II Diodes: Types of diodes, Signal diodes, Power diodes, Zener diode (Zener effect, Avalanche effect & Voltage regulation), Varactor diodes, Light emitting diodes Transistor: Introduction to Transistor structure, The working of a transistor Relation between currents in a transistor, DC alpha, Transistor amplifying action, Transistor configurations, Transistor characteristics, Common-Emitter configuration, current relations, relation between alpha and beta, Input and output CE characteristics, Basic CE amplifier circuit, DC load line	25%
III	Nuclear Structure and Nuclear Transformations Nuclear Transformations: Radioactive decay, Half-life, Radiometric dating Nuclear Structure: Nuclear composition Atomic masses, nuclear electrons, Some nuclear properties : spin and magnetic moment, Nuclear magnetic resonance, applications of NMR, Stable nuclei : nuclear decay, Binding energy : binding energy per nucleon, The strong interaction, Liquid drop model	25%
IV	Modern Physics Introduction to Black body radiation, Wien.s Law, Rayleigh-Jeans Law, Planck.s Law of Radiation & Special Cases of Planck.s Law, Compton effect De Broglie.s hypothesis, Davisson and Germer Experiment, Heisenberg.s Uncertainty principle, Bohr atom model and its limitations, Wilson-Sommerfeld relativistic atom model, Vector Atom model and associated quantum numbers	25%

Basic Text & Reference Books:

- Basic Electronics and Linear Circuits - N. N. Bhargava, D.C. Kulshreshtha & S.C. Gupta
Tata McGraw-Hill Ltd., New Delhi
- Concepts of Modern Physics - Arthur Baiser, Tata McGraw Hill, New Delhi
- Atomic Physics - J. B. Rajam, S. Chand & Company Ltd., (7th Edition)

