

SARDAR PATEL UNIVERSITY
Programme: B.Sc
Semester: I
Syllabus with effect from: June-2011

Paper Code: US01CPHY02	Total Credit: 2
Title of Paper: Network Analysis, Optics & Laser	

Unit	Description in Detail	Weightage (%)
I	Network Analysis Elementary Network Theory Network terminology, Network analysis by mesh currents (two & three mesh network) Circuit analysis by Node-pair voltages (one & two node pair voltage method), Voltage divider theorem, Superposition theorem, Thevenin.s theorem, Norton.s theorem	25%
II	Bridges & Their Application DC Bridges Whetstone Bridge, Basic operation, Measurement errors, Thevenin equivalent circuit, Kelvin Bridge, Effects of connecting leads AC bridges and their application Condition for bridge balance, Application of the Balance equation, Maxwell Bridge, Hay Bridge, Schering Bridge, Wien Bridge	25%
III	Optics Interferometry: Jamin.s refractometer or interferometer, Rayleigh.s refractometer, Michelson.s Interferometer, Types of fringes, white light fringes, Uses: measurement of wavelength of light of a monochromatic source, measurement of refractive index of a thin plate Resolving Power of Optical Instruments: Meaning of resolving power, Rayleigh.s criterion for resolution, R. P. of Grating, R. P. of Prism, R. P. of Telescope, R. P. of Microscope	25%
IV	Lasers Introduction & Properties of LASER, Stimulated absorption, Spontaneous emission and Stimulated emission, Relation between Einstein.s A and B coefficients, Population Inversion and Pumping, Main components of LASER source, Nd:YAG LASER, CO2 LASER, Application of LASER in material processing Holography and Other applications of Laser	25%

Basic Text & Reference Books:

- Principles of Electrical Engineering (2nd Edition), Vincet Del ToroPrentice - Hall of India Private Ltd.
- Electronic Instrumentation and Measurement Techniques (3rd Edition) W. D. Cooper and A. D. Helfrick,Prentice-Hall of India Private Ltd
- A textbook of light, D. N. Vasudeva (10th Edition), Atma Ram & Sons, New Delhi
- Engineering Physics, R. K. Gaur and S. L. Gupta, Dhanpatrai Publication (P) Ltd.,New Delhi
- Engineering Physics, K. Rajagopal, Prentice - Hall of India Private Ltd

