

HEMCHEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B. Sc. PHYSICS - SEMESTER – II

TYPE OF COURSE: INTER/ MULTI DISCIPLINE SPECIFIC COURSE

PROGRAMME CODE: SCIUG101 COURSE CODE:SC23MDSCPHY203

COURSE NAME: ELECTRICITY AND OPTICS

Effective from June 2023 Under NEP – 2020

Total Credits: 02	Theory	External Marks - 25
Teaching Hours per Week: 02		Internal Marks - 25
Teaching Hours per Semester: 30		

:: Syllabus ::

Unit No.	Content	Credit	Lect. Hrs 30
Unit-1	<p>Electricity:</p> <p>D.C. Circuits: Simple R-L Circuit-Growth and decay of current Helmholtz equitation (11.24), R-C Circuit (11.25), Measurement of High Resistance by method of leakage (11.26), Comparison of capacities by De- Sauty 's Method (11.27), Ideal L-C. Circuit (11.28), Series L-C-R Circuit (change case only) (11.29) <i>(Related Examples & Problems)</i></p> <p>Network Theorems: Thevenin's Theorem (18.6), Maximum Power Theorem (18.8)</p> <p>A.C. Bridges.: AC Bridges (17.5) A.C. Bridges for the measurement of inductances (17.6) (1) Maxwell Bridge (2) Anderson Bridge A.C. Bridge for the measurement of <i>capacitance</i> (17.7) (1) De Sauty's A.C Bridge (2) Schering Bridge <i>(Related Examples & Problems)</i></p> <p>Basic Reference: <i>Electricity and Magnetism by K.K. Tewari (S. Chand & Company Ltd)</i></p>	1	15
Unit-2	<p>Optics:</p> <p>Refraction Through Lenses: Introduction of various shape of Lenses, Lenses(4.2), Lens equation(4.9), Smallest separation of object and real image in a Convex Lens(4.13), Deviation by a thin Lenses(4.15), Power of Lens(4.15), Equivalent Focal Length of two thin lenses Separated by a finite distance (4.17), Focal Length(4.17.1), Cardinal points(5.2)</p> <p>Aberrations: Introduction (5.1), The Achromatic Doublet (5.2.1), Monochromatic aberration (5.3), Spherical aberration (5.3.1) <i>(Related Examples & Problems)</i></p> <p>Interference: Interference in Thin Films (8.15), Interference due to Reflected light (8.16), Interference due to Transmitted light (8.17), Newton's Rings (8.23), Determination of the Wavelength of Sodium Light using Newton's Rings (8.24), Refractive index of a liquid using Newton's Rings, Refractive index using Graph (8.25) <i>(Related Examples & Problems)</i></p> <p>Basic Reference:</p> <p>1) <i>A Textbook of OPTICS By N.Subhramanyam & Brijlal (S.Chand Co. Ltd.)</i></p> <p>2) <i>Optics by Ajay Ghatak (THM Edition) (For Aberration)</i></p>	1	15

Other References – Further Readings

- Electrical Circuit Analysis by Sony and Gupta
- Network Analysis by G.K. Mittal. (Khanna Publications)
- Electricity and Magnetism by D. C. Tayal
- Principal of Optics by B.K Mathur (S. Chand & Company Ltd)
- Optics and Atomic Physics by D.P. Khandelval (Himalaya Publishing house)
- A Text book of Optics by N Subhramanyan and Brijalal