

B. Sc. Part-IIPHYSICS (General and Subsidiary Course)

The course shall consist of one theory paper (Paper II theory) of 70 marks. The pass marks will be 21 and the examination will be of 3 Hours duration in this paper. There will be also one practical paper (paper II practical) of 30 marks. The pass marks will be 12 and the examination will be 6 hours duration in this paper.

The following will be the detailed course : .

Time: 3 Hours]

PAPER-II

[Full Marks: 70

12 questions to be set; 6 to be answered, one from Group A, 3 from Group B and 2 From Group C.

GROUP-A

Electrostatics and Magnetism 2 (1+ 1) Questions

Boundary conditions at the surface of operation of two dielectrics, Electric dipoles, Dipole Moment, Dielectric polarisation, Electrical Image-problem involving infinite conducting plane and thin conducting spherical shell only.

Magnetic shell, Langevin's and Weiss theory of dia, para and Ferro Magnetism, Curie law Production and measurement of strong magnetic fields Magnetic circuit and Electromagnets.

GROUP-B

Current electricity, Modern Physics

(6 Questions)

Thermodynamic treatment of Seebeck, Peltier and Thomson effects and their application, Moving coil Galvanometer, a periodic and ballistic galvanometers, Growth and decay of currents in electric circuit. Oscillatory discharge of condenser.

AC and DC circuits: Use of Vectors and complex quantities in Ac. Circuit theory (LR, CR, AND LCR, circuits) De Sauty's bridge, Anderson's bridge, Carey Foster's bridge.

Measurement of charge by Milliken's method and specific charge of an electron by Thompson method, Natural radioactivity, Rutherford Soddy's Theory of radio active decay, Geiger-Muller counter, Discovery of Neutron Isotope, Artificial radioactivity. Elementary ideas about nucleus and structure, Nuclear fission Reactors, Aston's mass spectrograph.

Photoelectric emission, Einstein's photoelectric equation, Photo-conductive and photo-voltaic cells.

Compton effect, Bragg's law and determination of X ray's wave length.

Cathode ray oscilloscope and its uses in amplitude, frequency and phase measurements, Solid state rectifier. One stage R-C amplifier, Principle of amplitude modulation and demodulation, Radio receiver through block diagram.

GROUP-C**OPTICS**

Fermat's principle, Newton's ring. Michelson's interferometer, Fresnel's diffraction at straight edge, Fraunhofer's diffraction, single slit, double slit, plane transmission, grating microscope, resolving power of microscope, Polarization, production of plane, circularly and elliptically polarised lights, Nicol's prism, Quarter waveplate, Half wave plate, polarimeter, Babinet's compensator.

Bohr's theory of hydrogen spectra, principle of laser action, Rayleigh. Maxwell equations, Equation of plane electromagnetic waves and its solution,

PRACTICAL**Time: 6 Hours]****PAPER-II****[Full Marks: 30**

The course shall include following experiments:

1. Refractive index by Spectrometer.
2. Wavelength by Newton's ring.
3. Wavelength by plane transmission grating.
4. Magnifying Power of microscope.
5. Magnifying power of telescope.
6. Resolving power of telescope.
7. Dip by (i) Dip circle (ii) Earth's inductor.
8. Figure of merit of moving Galvanometer.
9. Measurements of low and high resistance.
10. Temperature variation of electrical resistance.
11. Characteristics of valve and semiconductor diodes.