

Berhampore Girls’ College

Physics Department

Teacher: **Dr. Sagar Kumar Dutta**

Designation: Associate Professor

Class Notes : Pdf files attached

Details of Study Materials: a) Semester -2 (Hons.) PHY-H-CC-T-03**: ELECTRICITY AND MAGNETISM)**

Electric field: Electric field lines. Electric flux. Gauss' Law with applications to charge distributions with spherical, cylindrical and planar symmetry.

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace's and Poisson equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole.

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere.
Conductors in an electrostatic Field. Surface charge and force on a conductor.
Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere.

Dielectric Properties of Matter:

Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss' Law in dielectrics.

Details of Study Materials: a) Semester -4 (Hons.) PHY-H-CC-T-08**: MATHEMATICAL PHYSICS-III**

**Complex Analysis:** Brief Revision of Complex Numbers and their Graphical Representation. Euler's formula, De Moivre's theorem, Roots of Complex Numbers.
Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions.