

VIVEKANANDA COLLEGE, ALIPURDUAR

B.sc 2nd Semester-2025

PHYSICS DSCPHYMAJ-2

F.M: 20

Electricity and Magnetism

FYUGP (NEP)

Three Discipline specific Multidisciplinary Course

Assignment

1. A piece of iron of dimension 5 cm x 2 cm x 1cm and magnetic moment of each atom $16 \times 10^{-24} \text{ Am}^2$. At the state of saturated induced moment, find the magnetic moment of the iron piece. Given, atomic mass of iron= 56 and density= 7.8gm/cc 2
2. A system has two charges, $q_A = 2.5 \times 10^{-7} \text{ C}$ and $q_B = - 2.5 \times 10^{-7} \text{ C}$ are located at points A(0,0,-15) and B(0,0,15). Calculate the dipole moment and also describe its direction. 4
3. Two wires A and B have the same length equal to 44cm and carry a current of 10 Amp. A is bent into a circle and B is bent into a square. 2 + 2
 - (a) Obtain the magnitudes of the fields at the centers of the wires.
 - (b) Which wire produces a greater magnetic field at the center?
4. State the Faraday's law. Discuss the physical significance of Faraday's law. 1 + 2
5. State the Lenz's law. Discuss the physical significance of Maxwell's equations. 4
6. State and explain Gauss divergence theorem. 3

VIVEKANANDA COLLEGE, ALIPURDUAR

B.sc 4th Semester-2025

PHYSICS MDC003/004

Introduction to Cosmic Ray Physics

FYUGP (NEP)

Assignment

F.M: 20

1. Explain Primary and secondary cosmic rays. 2 + 2
2. What are Pair production and annihilation? 2 + 2
3. Explain a note of Air shower formation by High energy muon and High energy electron. 6
4. What are the importance π - meson and μ - meson qualitatively through cosmic ray studies on the Earth? 6

VIVEKANANDA COLLEGE, ALIPURDUAR

B.sc 6th Semester-2025

PHYSICS DSE-P

CBCS

F.M: 20

Assignment

1. Obtain the Miller indices of a plane which intercepts at a , $b/3$ and $2c$ in a simple cubic unit cell. 2
2. Define geometrical structure factor. How it is related to atomic scattering factor? 2
3. Derrive Curie's law of paramagnetism from Langevin's theory. 4
4. Calculate the interplanar spacing for a (321) plane in a simple cubic crystal whose lattice constant is 4.2 Angstrom. 3
5. Explain hysteresis and energy loss in terms of B-H curve. 3
6. What is the Hall coefficient? Show that for a p-type semiconductor the Hall coefficient $R_H = 1/ne$, where the symbols have their usual meaning. 6