Sc. I Year **Paper-B**

Biyani Girls College
Model Test Paper-2015-16
Electro Magnetic

Time- 3 Hours **Maximum Marks- 100**

Unit-I

1. Define curl of vector field and find its expression in Cartesian co-ordinates.
2. Define the divergence of a vector field. Derive an expression for divergence of a vector field in Cartesian co-ordinate system.

Unit-II

3. Derive relation between coplocian operator, poison's and Laplace equation.
4. Electric field intensity due to electric short dipole.

Unit-III

5. Derive equation for electric potential and electric field due to a uniformly polarized sphere.
6. Derive equation for electric field due to a dielectric sphere placed in a uniform electric field.

Unit-IV

7. Prove that the change in the orbital magnetic moment of an electron due to an external magnetic field is given by-

$$\Delta \mu = \pm \frac{e^2 r^2 \beta}{4m}$$

8. Define orbital gyro magnetic ration and bolter magnetron.

B.Sc. I Year **Paper-B**

Biyani Girls College
Model Test Paper-2015-16
Electro Magnetic

Time- 3 Hours **Maximum Marks- 100**

Unit-I

1. Define divergence of a vector filed and explain its physical importance. Derive the expression for the divergence of a vector field in Cartesian co-ordinate system. State and prove Gauss's divergence theorem.
2. Define curl of a vector. Derive an expression for the curl of a vector in Cartesian co-ordinates

Unit-II

3. The distance between $H^+ Ci^-$ ions in an HCl moleenle is 0.2A°. Determine the maximum and minimum values of the potential of a distance of 10A° from the centre of the dipole.
4. What is electrostics potential energy? Derive an expression for the energy required to build a uniformly charged sphere of radius R and charge

Unit-III

5. Define electric susceptibility and atomic Polaris-ability and establish the relation between them.
6. Determine the electric field inside a polarized dielectric and hence derive the Gauss law.

Unit-IV

7. Determine the savant's law using magnetic vector potential? And curl relation in B and A.
8. Obtain a relation between magnetic forcibility and magnetic permeability