I4PHP13

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc **DEGREE EXAMINATION DECEMBER 2018**
(Third Semester)

Branch-**PHYSICS**

ELECTROMAGNETIC THEORY

Time: Three Hours Maximum: 75 Marks

Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 15 = 75)

1 a Derive the expressions for local field and then obtain Clausius - Mossotti equation.

OR

b What is an electric dipole? Derive the expressions for electric potential and electric field intensity at a point which is at a distance from the centre of the dipole.

2 a Show that the divergence of magnetic induction is zero and obtain the expression for the curl of the magnetic field induction.

OR

b Explain the frequency dependence, anisotropy and potential energy of a charge distribution in the presence of dielectrics.

3 a Derive the Lorentz condition. Also obtain the equation for divergence of E and non-homogenous wave equation for V.

OR

b Derive the expression for induced electromotance in a moving system. Also discuss about the electromotance induced in a loop rotating in fixed magnetic field.

4 a Explain the propagation of plane electromagnetic waves in good conductors. Also find the propagation in copper at 1 MHz.

OR

b Obtain the wave equation for E and H for the plane electromagnetic waves propagating in homogenous, isotropic, linear and stationary media.

5 a Derive the expression for total radiated power and radiation resistance of the oscillating electric dipole.

OR

b Discuss the propagation of electromagnetic waves in a straight line and explain the TE and TM waves.

Z-Z-Z END