AALIM MUHAMMED SALEGH COLLEGE OF ENGINEERING, MUTHAPUDUPET, AVADI-IAF, CHENNAI-600055
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
MODEL EXAMINATION
QUESTION PAPER-3

SUBJECT CODE: EC2253
SUBJECT NAME: ELECTROMAGENTIC FIELDS **MARKS:100**

PART-A **(10*2=20)**

1.Write down expression for x,y,z in terms of spherical co-ordinates r,θ,Φ?
2.What is physical significance of divergence of D?
3.Define electric field and electric potential?
4.Write down the expression for the torque experienced by a current carrying loop situated in a magnetic field.
5.State the applications of Poisson's equation and Laplace's equation.
6.What is Polarization?
7.State point form of ohm's law
8.Distinguish between Field theory and Circuit theory
9.What is skin depth?
10.Write down the wave equation for E and H in a conducting medium

PART-B **(16*5=80)**

11 a) State and prove Stoke's theorem and Divergence theorem. (16)

OR

b) A circular disc of radius 'a' m is charged uniformly with a charge density of σ c/ m2.find the electric field at a point 'h' m from the disc along its axis. (16)

12. a (i) Derive the expression for the magnetic field intensity due to rectangular coil carrying current I in a uniform field. Deduce the equation to find the H due to square coil (10)

(ii). State Ampere's circuital law and prove the same. (6)

OR

b)Derive the expressions for magnetic field intensity and magnetic flux density due to circular coil.(16)

13 . a) Derive the boundary conditions of the normal and tangential components of electric field at the interface of two media with different dielectrics. (16)

OR

b) Derive an expression for energy stored and energy density in an Electrostatic field (16)

14 a)With necessary explanation, derive the Maxwell's equation in differential and integral forms (16)

OR

b(i) What is the physical significance of the poynting vector? (4)
(ii) State and explain the poynting theorem. (12)

15 a) Briefly explain about the wave incident
(i) Normally on perfect conductor
(ii) Obliquely to the surface of perfect conductor. (16)

OR

b)A plane wave propagating through a medium with _r=8, μr=2 has E=0.5 sin (108t-z) az v/m. Determine(i) β,(ii) The loss tangent,(iii) wave impedance,(iv) wave velocity,(v) magnetic field. (16)