Printed Pages : 2

NEC404

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 131407

Roll No.

B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15

ELECTROMAGNETIC FIELD THEORY (EMFT)

Time : **2** Hours] [Total Marks : **50**

1 Attempt **any four** question. All parts carry equal marks. **3.5×4=14**

(a) State divergence theorem and Stroke theorem.

(b) Explain the physical interpretation of curl.

(c) Convert the Cartesian coordinate system into cylindrical coordinate system.

(d) Transform the point P(1,1,6) in spherical coordinate system.

(e) Explain the gradient of a scalar field. Also explain its physical interpretation.

(f) Write the laplace equation in all three coordinate system.

2 Attempt **any two** questions. All Question carry equal marks. **6×2=12**

(a) Find the potential function and electric field intensity for the region between two concentric right circular cylinder where V=Vo at r=a and V=0 at r=b (b>a)?

(b) Find the electric field intensity due to infinitely long charged wire(line charge).

(c) Derive Energy Density in electrostatic field.

3 Attempt **any two** questions. All Question carry equal marks. **6×2=12**

(a) State and explain maxwell's equations in differential and integral form.

(b) Explain magnetic boundary conditions.

(c) State and explain Bio savart law. Derive magnetic field intensity due to infinitely long wire carrying current I.

4 Attempt **any two** questions. All Question carry equal marks. **6×2=12**

(a) Find the value of α, β, for good conductors. Show that angle of characteristic impedence is always 45° for good conductors.

(b) Derive the mathematical expression for poynting theorem.

(c) Find the expression for α, β γ, for lossless or perfect dielectric medium. A 10 GHZ plane wave traveling in free space has an amplitude of E_x=10 V/m. Find V, η, β, λ and the amplitude of H.