



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

PAPER ID : 131407

Roll No.

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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 **3.5×4=14** equal marks.
- State divergence theorem and Stroke theorem.
 - Explain the physical interpretation of curl.
 - Convert the Cartesian coordinate system into cylindrical coordinate system.
 - Transform the point P(1,1,6) in spherical coordinate system.
 - Explain the gradient of a scalar field. Also explain its physical interpretation.
 - Write the laplace equation in all three coordinate system.
- 2 Attempt **any two** questions. All Question carry **6×2=12** equal marks.
- Find the potential function and electric field intensity for the region between two concentric right circular cylinder where $V=V_0$ 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 **6×2=12** equal marks.

- (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 **6×2=12** equal marks.

- (a) Find the value of α, β , for good conductors. Show that angle of characteristic impedance 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.