



(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 $3.5 \times 4 = 14$ equal marks.
- (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 $6 \times 2 = 12$ equal marks.
- (a) 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 $6 \times 2 = 12$ 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 $6 \times 2 = 12$ 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.