

II B. Tech II Semester Supplementary Examinations, November - 2018
ELECTRO MAGNETIC WAVES AND TRANSMISSION LINES
 (Com to ECE, EIE)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **FOUR** Questions from **Part-B**
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PART -A

1. a) Define Continuity equation? Write in equation form? (3M)
- b) List out the boundary conditions between dielectric to dielectric and dielectric to conductor? (3M)
- c) Define parallel and vertical polarizations? (2M)
- d) Define Poynting vector? (2M)
- e) Define loss less line and write the primary and secondary constants at this Condition? (2M)
- f) Define stub matching? (2M)

PART -B

2. a) Prove that $E = -\nabla V$ (7M)
- b) The point Charges $-1nC$, $4nC$, and $3nC$ are located at $(0,0,0)$, $(0,0,1)$ and $(1,0,0)$, respectively . Find the energy in the System. (7M)
3. a) Derive the electric field boundary conditions between dielectric and conductor? (7M)
- b) An electron with velocity $u = (3\mathbf{a}_x + 12\mathbf{a}_y - 4\mathbf{a}_z) 10^5$ m/s experiences no net Force at a point in a magnetic field $B = 10\mathbf{a}_x + 20\mathbf{a}_y + 30\mathbf{a}_z$ mWb/m². Find E at that point. (7M)
4. a) Define uniform Plane wave? What are the characteristics of plane Wave? Explain (7M)
- b) A manufacturer produces a ferrite material with $\mu = 750\mu_0$, $\epsilon = 5\epsilon_0$, and $\sigma = 10^{-6}$ S/m at 10MHz. i) Would you classify the material as lossless , lossy, or conducting? ii) Calculate β and λ . (7M)
5. a) A uniform plane wave in air is normally incident on an infinite lossless Dielectric material having $\epsilon = 3\epsilon_0$ and $\mu = \mu_0$. If the incident wave is $E_i = 10\cos(\omega t - z)\mathbf{a}_y$ V/m, find γ (7M)
- b) Explain the concept of critical angle and total internal reflections (7M)

