7. A 2 m long lossless transmission line has an impedance of 300 Ω. The velocity of propagation is 2.5×10^8. The load has an impedance of 300 Ω with sending end voltage being 60V at 100 mHz find.

(a) The Phase constant

(b) The load voltage

(c) The load current

(d) The load reflection co-efficient

(e) Standing vave ratio.

8. Write short notes on the following : **20**

(a) Poynting's theorem

(b) Waves in conducting media

(c) Skin effect.

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B. Tech. EXAMINATION, May 2017

(Fourth Semester)

(Old Scheme) (Re-appear Only)

(EE-ECE-AEI-EEE-IC)

EE-208

ELECTRO MAGNETIC THEORY

Time : 3 Hours]   [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt any *Five* questions. All questions carry equal marks.

1. (a) State and explain Coulomb's law in electrostatics. Express it mathematically for two point charges. Does the form depend on the system of units ? **10**

   (b) Define electric field E at a point and show that : **10**

   $$\nabla \times \vec{E} = 0$$

2. (a) Explain the concept of vector magnetic potential. What is its unit ? Explain, why being potential. It is a vector Quantity. **10**

   (b) Determine the magnetic field $\vec{H}$ for a solid cylindrical conductor of radius a, where the current I is uniformly distributed over the cross-section. **10**

3. (a) Justify the statement "most electrical machines are working on electromagnetic principles rather than electrostatic principle". **10**

   (b) Explain the Maxwell Modified Ampere's Circuital Law for steady currents. **10**

4. (a) Discuss wave propagation in a conductor. Derive Relevant equations. **10**

   (b) Derive basic equation for electro-magnetic waves in free space in terms of E and H. **10**

5. Define and distinguish between Brewster's angle and critical angle with reference to an electromagnetic wave Incident on a separating surface between two perfect Dielectrics, show that Critical Angle is normally greater than Brewster's angle. **20**

6. (a) What is characteristic Impedance of a Transmission line ? Derive its expression. What will be the characteristics Impedance if the line is : **10**

   (i) Lossless line ?

   (ii) Distortion less line ?

   (b) Draw the equivalent circuit of a transmission line and hence write a transmission line equastion for an elemental section of a trasmission line. **10**