

**B.Tech. – VIEP – ELECTRONICS AND  
COMMUNICATION ENGINEERING  
(BTECVI)**

**Term-End Examination**

00383

**June, 2018**

**BIEL-006 : ELECTROMAGNETIC FIELD THEORY**

*Time : 3 hours*

*Maximum Marks : 70*

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*Note : Attempt any **seven** questions. All questions carry equal marks. Symbols used have their usual meanings. Use of scientific calculator is allowed. Missing data, if any, may be assumed.*

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1. Use spherical co-ordinates and find the area of the region  $0 \leq \phi \leq \alpha$  on the spherical shell of radius  $a$ . What is the area if  $\alpha = 2\pi$ ? 10
  
2. An infinite long line charge of uniform density  $\rho_L$  coulombs/cm is situated along the  $z$ -axis. Obtain the electric field intensity due to this charge using Gauss's Law. 10
  
3. State and explain Ampere's circuital law in integral form. 10

4. In a given lossy dielectric medium, conduction current density is given as  $J_c = 0.02 \sin 10^9 t$  (A/m<sup>2</sup>). Find the displacement current density if  $\sigma = 10^3$  S/m and  $\epsilon_r = 6.5$ . 10
  5. What is uniform plane wave ? Obtain solution for a uniform plane wave in homogeneous dielectric medium. 10
  6. What is Poynting Vector ? Explain average Poynting Vector. 10
  7. What is transverse electric wave ? Explain its characteristics. How is it different from transverse magnetic wave ? 10
  8. Explain the phenomenon of reflection for transmission lines. Derive the expression for reflection coefficient. 10
  9. Write short notes on any **two** of the following :  $2 \times 5 = 10$ 
    - (a) Biot-Savart's Law
    - (b) Maxwell's Equations and their Interpretations
    - (c) Standing Wave Ratio
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