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BIEE-005

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B.Tech. VIEP - ELECTRICAL ENGINEERING - III / BTELVI

Term-End Examination

June, 2012

BIEE-005 : ELECTROMAGNETIC THEORY

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any seven** questions of the following.*

1. Using vector form of Coulomb's law by locating a charge of $Q_1 = 3 \times 10^{-4}$ C at M (1,2,3,) and a charge of $Q_2 = -10^{-4}$ C at N (2,0,5) in a vacuum. Find the force exerted on Q_2 by Q_1. **10**

2. What happens when the charge distribution is suddenly unbalanced within a conducting material. Explain conductor properties and boundary conditions. **10**

3. (a) Write Maxwell's equation and boundary conditions. **5**

   (b) Find capacitance of a parallel plate capacitor having a mica dielectric, $E_R = 6$, a plate area of 10 cm^2 and a separation of .01 cm **5**

4. Explain and derive a equation of Gauss's theorem with a suitable diagram. **10**

5. Derive the equation for spherical coordinate system defining the distance from the origin to any point as r. **10**

6. Explain Biot Savert Law, show that total current crossing any closed surface is zero. **10**

7. State and prove Stoke's theorem with a neat sketch diagram. **10**

8. Explain Impedance matching and its measurement in transmission lines. **10**

9. A lossless transmission line is 80 cm long and operates at a frequency of 600 MHz. The line parameters are L=0.25 μH/m and C=100 pF/m. Find the characteristic impedance, phase constant, velocity on the line. **10**

10. Write short notes on ***any two*** of the following : **5x2=10**
    (a) Different coordinate systems
    (b) Snell's law of refraction
    (c) Green's function