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BIEL-006

B. Tech. IN ELECTRONICS AND COMMUNICATION ENGINEERING

01577

Term-End Examination

June, 2011

BIEL-006 : ELECTROMAGNETIC FIELD THEORY

Time : 3 hours *Maximum Marks : 70*

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

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1. (a) Explain the physical significance of the term : **7**

(i) Divergence of a vector field

(ii) Curl of the vector field

(b) State and explain Coulomb's law in electrostatics. Find the force on charge q_1 (100μC), due to charge q (-300μC) where q_1 is at (0, 1, 2) m and q_2 at (3, 0, 0) m. **7**

2. (a) Explain the concept of electric field and derive expression for electric field intensity due to point charge. **7**

(b) State and explain Ampere's circuital law find the expression of energy stored in magnetic field. **7**

3. (a) Write and explain briefly differential and integral forms of Maxwell's equation. 7

(b) Discuss wave propagation in good conductors. Define skin depth for a conducting medium. 7

4. (a) State and prove Poynting's theorem. Also give the physical interpretation of $\vec{E} \times \vec{H}$. 7

(b) What is Smith chart ? What are its applications ? 7

5. (a) Explain the principle of Impedance matching through stub. 7

(b) An Ideal lossless transmission line of $Z_0 = 60\ \Omega$ connected to unknown Z_L if SWR=4, find Z_L, reflection coefficient and transmission coefficient. 7

6. (a) What do you mean by guided waves, explain TEM, TE and TM waves ? 7

(b) Discuss propagation characteristic of TE and TM wave. 7

7. Write short notes on the following (*any two*) : **7x2=14**

(a) Gauss's law

(b) Displacement current

(c) Standing Wave Ratio (SWR)

(d) Wave polarization