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BIEL-006

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B.Tech. ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

December, 2013

BIEL-006 : ELECTROMAGNETIC FIELD THEORY

Time : 3 hours *Maximum Marks : 70*

Note : *(i) All questions carry **equal** marks.*

*(ii) Attempt **any seven** questions out of ten questions.*

*(iii) Use of scientific **calculator** is allowed.*

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1. (a) Discuss the cartesian coordinate system. 5

(b) Consider two vectors A & B. 5

$A = 21x + 21y + 21z$ and $B = 21y + 21z$.

Determine $\vec{A} \times \vec{B}$.

2. Consider two points A(x = 2, y = 3, z = −1) and B(r = 4, $\phi = -50°$, z = 2). Determine the distance from **2x5=10**

(a) A to origin.

(b) A to B.

3. (a) Derive the expression for field due to continuous volume charge distribution. 5

(b) Derive the expression for field due to a line charge. 5

4. Derive the expression for electric field intensity at a point due to a dipole. **10**

5. State and explain Gauss's Law in differential form and also explain the meaning of $\nabla.D$. **10**

6. Derive and explain the Maxwell's Curl equation for static electric field. **10**

7. What is distortionless line ? How to achieve distortionless condition of the line. Derive the necessary equation. **10**

8. (a) What are the advantages of transmission lines ? **5**

   (b) What is 'Matched transmission' line ? **5**

9. Discuss the wave propogation in perfect dielectric. **10**

10. Write short notes on ***any two*** of the following : **2x5=10**

    (a) Gauss's Law.

    (b) Ampere's Circuital Law.

    (c) Standing waves.