Roll No:

KARPAGAM COLLEGE OF ENGINEERING, COIMBATORE -641 032.

B.E Degree Electrical and Electronics Engineering **Semester: III**

14E304 ELECTROMAGNETIC THEORY

Continuous Internal Assessment: I **Date: 29.07.2015**
Time: Two Hours **Session: AN**
Maximum: 50 Marks

Answer ALL Questions **PART A – (10 x 2 = 20 marks)**

A1. Find the dot product of the vectors if $\vec{A} = 2\overrightarrow{a_x} - 2\overrightarrow{a_y}$ and $\vec{B} = -\overrightarrow{a_x} + 2\overrightarrow{a_z}$

A2. Give the relation between cylindrical and Cartesian co-ordinate system.

A3. State the expression for electric field intensity

A4. Given three points in Cartesian co-ordinates system A (3,-2, 1) and B (-3,-3, 5). Find the unit vector from B to A.

A5. Define point charge

A6. Derive the relation between electric flux density and intensity.

A7. List any two applications of Gauss law.

A8. Define Potential Difference.

A9. Under what condition will the electric field ($\vec{E}$) be solenoidal?

A10. Define dipole and dipole moment.

Answer ALL Questions **PART B– (2 x 15 = 30 marks)**

B1. (a) (i) Obtain the expression for electric field intensity due to infinite line charge having density ρ_L C/m, placed along z-axis, at a point P on y axis at a distance of r from the z axis. [10]

(ii) Write short notes on Dot product and cross product. [5]

(OR)

(b) (i) State and explain Coulomb's law. [8]

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(ii) Find the force of interaction between two charges spaced 10cm apart in vacuum, the charges are 4nC and 6μC respectively. If the same charges are separated by the same distance in kerosene with $\varepsilon_r = 2$, what is the force of interaction? [7]

B2. (a) (i) State and prove Gauss's Law with the help of a spherical system. [10]

(ii) Given $\vec{A} = 2xy\vec{a}_x + z\vec{a}_y + yz^2\vec{a}_z$ find $\nabla.\vec{A}$ at P (2,-1, 3). [5]

(OR)

(b) (i) Derive an expression for potential due to point charge. [7]

(ii) A dipole having moment $\vec{p} = 3\vec{a}_x - 5\vec{a}_y + 10\vec{a}_z$ nCm is located at Q (1,-2, 4) in free space. Find V at P (2, 3, 4). [8]

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