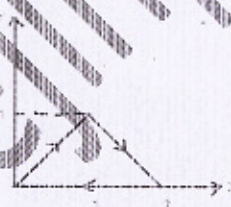


Rejinpaul.com Important Questions For Nov/Dec 2013 Exams
III Semester B.E-Electrical and Electronics Engg.
Subject Name: EE2202: ELECTROMAGNETIC THEORY
Important 16 Marks Questions Unit I -V

UNIT I

1. Given $A = 5a_x$ and $B = 4a_x + ta_y$; find 't' such that the angle between A and B is 45° .
2. Using Divergence theorem, evaluate $\iiint_V \nabla \cdot \vec{A} dV$ where $\vec{A} = 2xy \vec{a}_x + y^2 \vec{a}_y + 4xz \vec{a}_z$ and S is the surface of the cube bounded by $x = 0, x = 1; y = 0, y = 1$; and $z = 0, z = 1$
3. Transform the vector $\vec{A} = 4a_x - 2a_y - 4a_z$ at $p(x = +2, y = +3, z = 4)$ to spherical coordinate.
4. Write short notes on the following: (a) Gradient (b) Divergence (c) Curl and (d) Stokes theorem.
5. Determine the gradient of the scalar field at $P(\sqrt{2}, \frac{\pi}{2}, 1)$ defined in cylindrical co-ordinate system as $A = 25r \sin \phi$
6. Given that $F = x^2 y a_x - y a_y$. Find $\oint_C F \cdot d\vec{l}$ for the closed path shown in figure and also verify Stoke's theorem



UNIT II

1. Find the potential at any point along the axis of a uniformly charged disc of $\sigma \text{ C/m}^2$. The disc has radius of 'a' m.
2. Deduce an expression for the capacitance of a parallel plate capacitor having two dielectric media.
3. Write and explain the coulomb's law in vector form.
4. Derive the expression for electric field intensity due to a circular surface charge
5. Derive Poisson's and Laplace's equation
6. State and prove Gauss' law and write about the applications of Gauss law?

UNIT III

1. Derive the expression for magnetic flux density and magnetic field intensity due to an infinitely long conductor
2. State and prove Ampere's circuital law and Biot- Savart's law
3. State and explain Ampere's circuital law and show that the field strength at the end of a long solenoid is one half of that at the centre.
4. At a point P (x,y,z) the components of vector magnetic potential A are given as $A_x = (4x + 3y + 2z)$; $A_y = (5x + 6y + 3z)$ and $A_z = (2x + 3y + 5z)$. Determine B at point P.
5. Derive the boundary conditions between two magnetic media.

UNIT IV

1. Derive and explain Maxwell's equation in point and integral form using Ampere's circuital law and Faraday's law
2. The conduction current flowing through a wire with conductivity $\sigma = 3 \times 10^7$ s/m and relative permeability $\epsilon_r = 1$ is given by $i_c = 3 \sin \omega t$ (mA). If $\omega = 10^8$ rad/sec. find the displacement current.
3. Derive modified form of Ampere's circuital law in integral and differential forms.
4. The magnetic field intensity in free space is given as $\vec{H} = H_0 \sin \theta \hat{u}$, A/m. where $\theta = \omega t = \beta z$ and β is a constant. Determine the current density vector J.
5. Explain (a) Motional emf. (b) Transformer emf.
6. Derive Maxwell's equation for $\nabla \times \vec{E}$ and $\nabla \times \vec{H}$

UNIT V

1. Define Brewster angle and discuss the Brewster angle and degree of polarization.
2. What is Poynting vector? Explain. Derive pointing theorem.
3. Explain the propagation of EM waves inside the conductor.
4. Calculate the intrinsic impedance, the propagation constant and the wave velocity for a conducting medium in which $\sigma = 58$ Ms/m, $\mu_r = 1$ at a frequency of $f = 100$ MHz.
5. A plane wave propagating through a medium with $\mu_r = 2$, $\epsilon_r = 8$ has $\vec{E} = 0.5 \sin (10^8 t - \beta z) \hat{a}_x$ (V/m). Determine (i) β (ii) The loss tangent (iii) wave Impedance (iv) wave velocity (v) H field