Reg. No. : | | | | | | | | | | |

Question Paper Code: 34403

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Fourth Semester

Electronics and Communication Engineering

01UEC403 – ELECTROMAGNETIC FIELDS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. State divergence theorem.
2. What is an electric dipole? Write down the potential due to an electric dipole.
3. Define Biot –Savarts Law in vector form.
4. Define mutual inductance.
5. Define polarization.
6. Define capacitance and state the factors on which it depends.
7. Moist soil is having the conductivity of 10^{-3} *s/m* and $\varepsilon_r = 2.5$. If $E = 4 \sin 8t$, then find the conduction current density.
8. Give the expression of power flow in co-axial cable.
9. What is skin effect?
10. Define Brewster angle.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) State and prove Stokes theorem. (8)

(ii) State Coulomb's Law. Derive the vector form of Coulomb's Law. (8)

Or

(b) State and prove divergence theorem. (16)

12. (a) Derive the expression for magnetic flux intensity on the axis of a rectangular and circular loop carrying a current. (16)

Or

(b) (i) Derive the equation for torque on a current carrying loop. (8)

(ii) Obtain the expressions for scalar and vector magnetic potential. (8)

13. (a) State and derive electric boundary conditions for a dielectric to dielectric medium and a conductor to dielectric medium. (16)

Or

(b) Derive the capacitance of the spherical capacitor and parallel plate capacitor using Laplace equation. (16)

14. (a) Derive the Maxwell's equation in both differential form and integral form from (i) Ampere's law (ii) Gauss law (iii) Faraday's law. (16)

Or

(b) (i) State and prove poynting theorem. (8)

(ii) Derive the expression for total power flow in co-axial cable. (8)

15. (a) Derive the wave equations for uniform plane waves. (16)

Or

(b) Explain about the wave incident normally on perfect conductor and obliquely to the surface of perfect conductor. (16)

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