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Question Paper Code: 34403

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

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. Define curl and gradient of a vector.
3. Define Biot –Savarts Law in vector form.
4. Define mutual inductance.
5. Define polarization.
6. Define Coulomb's law.
7. State Lenz's law.
8. Define electric dipole and dipole moment.
9. What is skin effect?
10. What are the standing waves?

PART - B (5 x 16 = 80 Marks)

11. (a) Derive an expression for the electric field due to a straight and infinite uniformly charged wire of length 'L' meters and with a charge density of $+\lambda$ c/m at a Point P which lies along the perpendicular bisector of wire. (16)

Or

- (b) State and prove divergence theorem. (16)
12. (a) (i) Derive the expression for torque developed in a rectangular closed circuit carrying current I in a uniform field. (8)
- (ii) State Ampere's circuital law and explain any two applications of Ampere's Circuital law. (8)

Or

- (b) Derive a general expression for the magnetic flux density B at any point along the axis of a long solenoid. Sketch the variation of B from point to point along the axis. (16)
13. (a) State and derive electric boundary conditions for a dielectric to dielectric medium and a conductor to dielectric medium. (16)

Or

- (b) State and derive the magnetostatic boundary conditions at the interface between the conductor and free space. (16)
14. (a) State and explain pointing theorem. (16)

Or

- (b) Derive and explain Maxwell's equations both in integral and point forms. (16)
15. (a) Derive the wave equations for uniform plane waves. (16)

Or

- (b) Discuss about normal incidence and oblique incidence with respect to plane waves. (16)