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

Question Paper Code : 40957

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Fourth Semester
Electronics and Communication Engineering
EC 6403 – ELECTROMAGNETIC FIELDS
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. State divergence theorem.
2. Write the different coordinate systems.
3. Two capacitances C_1 and C_2 are connected in series. Find the equivalent total capacitance.
4. What is current density ?
5. What is vector magnetic potential ?
6. State Ampere circuital law.
7. Define – dielectric strength.
8. What is ferromagnetic material ?
9. What is electromotive force ?
10. Define Poynting's theorem.

PART – B (5×13=65 Marks)

11. a) i) State and prove Stokes theorem. (6)
    ii) Derive Electric field intensity due to line charge. (7)

(OR)

b) i) Derive the equation for potential difference to move a point charge in electric field. (7)
    ii) Derive the Electric field due to electric dipole. (6)

12. a) Derive an expression for energy stored in the electrostatic field of a section of a coaxial cable. (13)

(OR)

b) Derive the electric field boundary condition, when a wave travels between two different dielectrics medium. (13)

13. a) State Biot-Savart's law and derive the expressions for magnetic field intensity, of a straight current carrying conductor.

(OR)

b) Derive the magnetic field intensity of a circular current carrying conductor.

14. a) Derive the inductance of toroid and solenoid.

(OR)

b) i) Derive the equation which relates magnetization and permeability. (8)

ii) Explain the different types of magnetic materials. (5)

15. a) Derive the Poynting theorem equation from Maxwell's curl equation.

(OR)

b) Derive the Maxwell's equations in Differential form and integral form.

PART – C (1×15=15 Marks)

16. a) Apply Lorentz force equation, to derive the force on a differential current element.

(OR)

b) Illustrate with an example, to apply Poisson's and Laplace equation.
