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Question Paper Code: 34403

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Fourth Semester

Electronics and Communication Engineering

01UEC403 – ELECTROMAGNETIC FIELDS

(Regulation 2013)

Duration: 1:45 hour

Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

(Answer any ten of the following questions)

1. State Stoke's theorem.
2. Define curl and gradient of a vector.
3. What is magnetic flux density?
4. Define Biot Savart's law.
5. Define mutual inductance.
6. Define capacitance and state the factors on which it depends.
7. Moist soil is having the conductivity of 10^{-3} s/m and $\epsilon_r = 2.5$. If $E = 4 \sin 8t$, then find the conduction current density.
8. Define electric dipole and dipole moment.
9. What is skin effect?
10. What are the standing waves?
11. State Divergence theorem.
12. Define curl and gradient of a vector.
13. Define Biot –Savarts Law in vector form.

14. Define mutual inductance.

15. Define polarization.

PART – B (3 x 10= 30 Marks)

(Answer any three of the following questions)

16. Develop an expression for an electric field due to an infinite sheet of charge having uniform charge density ρ_s C/m^2 , placed in xy plane cut a point P on z -axis at a distance of ' z ' m from the origin. (10)
17. Derive the expression for torque developed in a rectangular closed circuit carrying current I in a uniform field. (10)
18. Derive the boundary conditions of the normal and tangential components of magnetic field at the inter face of two media with different dielectrics. (10)
19. State Ampere's circuital law and prove the modified form of Ampere's circuital law as Maxwell's first equation in integral form. (10)
20. Derive the electromagnetic wave equations in frequency domain and obtain the expressions for intrinsic impedance and propagation constant for free space, conductor and dielectric medium. (10)