A

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The Stoke's theorem uses which of the following operation?   CO1- R

    (a) Divergence   (b) Gradient   (c) Curl   (d) Laplacian

2. Spherical coordinate system variables, is transformed to Cartesian   CO1- R
    coordinate system then the value of y is given as _____

    (a) r sin θ cos φ   (b)) r sin θ sin φ   (c) r sin2 θ   (d) r cos 2 φ

3. Coulomb is the unit of which quantity?   CO2-R

    (a) Field strength   (b) Charge   (c) Permittivity   (d) Force

4. As charge increases, what happens to flux density?   CO2-U

    (a) Increases   (b) Decreases   (c) Remains constant   (d) Becomes zero

5. Which of the following cannot be computed using the Biot Savart law?   CO3- U

    (a) Magnetic field intensity   (b) Magnetic flux density

    (c) Electric field intensity   (d) Permeability

6. If a coil carrying current is placed in a uniform magnetic field, then   CO3- U

     (a) emf is produced   (b) Torque is produced

     (c) Force is produced   (d) Torque and force is produced

7. What is the another name for Transformer emf   CO5- U

    (a) Motional emf   (b) Statically Induced emf

    (c) A combination of motional and transformer emf   (d) None of the above

8. What is the major factor for determining whether a medium is free space,   CO5- U
   lossless dielectric, lossy dielectric or good conductor?

   (a) Attenuation constant   (b) Constitutive parameter(σ ,ε ,μ)

   (c) Loss tangent   (d) Reflection coefficient

9. Electromagnetic waves are represented in which of the following format?   CO5- U

   (a) Longitudinal waves   (b) Transverse waves

   (c) Sinusoidal waves   (d) Surface waves

10. Unit of Poynting Vector   CO5- App

   (a) Watt   (b) Watt/s   (c) Watt/m^2 (d) Watt/m

PART – B (5 x 2= 10 Marks)

11. Explain the terms differential length and differential surface in cylindrical   CO1-U
    coordinate system

12. Define Electric Field Intensity   CO2-U

13. State ampere circuital law   CO3-U

14. Contrasts Transformer EMF and Motional EMF.   CO5-U

15. Define Intrinsic Impedance   CO6-U

PART – C (5 x 16= 80Marks)

16. (a) Check validity of the divergence theorem considering the field   CO1-App   (16)
       D=xy^2 a$_x$+y^{3}a$_y$ +y^{2}zc/m^2 and the rectangular parallelepiped formed
       by the planes x=0, x=1,y=0,y=1 & z=0,z=1.

       <div align="center">Or</div>

    (b) Verify stokes theorem for the vector field B=ρcosϕ a$_\rho$ +sinϕ a$_\phi$ for   CO1-Ana   (16)
        the semicircle with diameter from -2 to +2

17. (a) Apply Coulomb's law to determine the electric field intensity due   CO2- App   (16)
       to infinite line of uniform charged wire

       <div align="center">Or</div>

    (b) At an interface separating conductor and free space show that the   CO2- App   (16)
        tangential component of Electric field intensity is continuous across
        the boundary, whereas the normal component of Electric field
        intensity is discontinuous at the boundary

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18. (a) At an interface separating two different magnetic materials show CO3- App (16)
that the tangential component of magnetic field intensity is
continuous across the boundary, whereas the normal component of
magnetic field intensity is discontinuous at the boundary

Or

(b) Verify ampere's circuital law for infinite long straight conductor CO4- App (16)
placed along z axis. Assume amperian loop for the straight
conductor

19. (a) With necessary explanation, derive the Maxwell's equation in CO5- App (16)
differential and integral forms for dynamic fields

Or

(b) State and explain Faraday's law of electromagnetic induction and CO5- App (16)
derive the expressions for statically and dynamically induced emf.

20. (a) Obtain the electromagnetic wave equation for free space in terms of CO6- U (16)
electric field and explain the wave propagation with necessary
parameters.

Or

(b) Derive an expression for pointing theorem in integral and pointing CO6- U (16)
form

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