Question Paper Code: 93305

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Electrical and Electronics Engineering

19UEE305 – FIELD THEORY

(Regulation 2019)

Duration: One hour   Maximum: 30Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Compute the divergence of the vector xi + yj + zk.   CO1- R

    (a) 1   (b) 2   (c) 3   (d) 0

2. A vector is said to be solenoidal when its   CO1- R

    (a) Divergence is zero   (b) Divergence is unity   (c) Curl is zero   (d) Curl is unity

3. Find the force between 2C and -1C separated by a distance 1m in air   CO2-R

    (a) 18×10^{6} (b) -18×10^{6} (c) 18×10^{-6} (d) -18×10^{-6}

4. Energy stored in 2000mF capacitor charged to a potential difference of 10V is?   CO2-R

    (a) 100J   (b) 200J   (c) 300J   (d) 400J

5. Calculate the magnetic field at a point on the centre of the circular conductor of   CO3- U
    radius 2m with current 8A.

    (a) 1   (b) 2   (c) 3   (d) 4

6. The point form of Ampere law is given by   CO3- R

    (a) Curl(B) = I   (b) Curl(D) = J   (c) Curl(V) = I   (d) Curl(H) = J

7. Magnetic dipole moment per unit volume is called as   CO3- R

    (a) Permittivity   (b) Magnetization   (c) Permeability   (d) Magnetic flux density

8. The relation between the direction of force and the direction of magnetic field is   CO4- R

    (a) Same direction   (b) Opposite direction   (c) Perpendicular   (d) Unrelated

9. Unit of Poynting Vector is _____   CO4- R

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

10. In a certain medium=10cos (108t-3y) ax V/m. What type of medium is it?   CO4- R

    (a) Free space   (b) Lossy dielectric

    (c) Lossless dielectric   (d) Perfect conductor

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Determine the curl and divergence of the given vector field   CO1- App   (8)
$P = x^2yz\ a_x + xz\ a_z$

12. Consider a charged circular ring of radius 'r' is placed in xy plane with   CO2- App   (8)
centre at origin carrying a charge uniformly along its circumference. The
charge density is ρ_l c/m. Calculate electric field intensity for the ring.

13. Apply Coulomb's law to determine the electric field intensity due to infinite   CO2- App   (8)
line of uniform charged wire.

14. At an interface separating two different magnetic materials show that the   CO3- App   (8)
tangential component of magnetic field intensity is continuous across the
boundary, whereas the normal component of magnetic field intensity is
discontinuous at the boundary.

15. Consider a solenoid of N turns. Let current flowing through the solenoid is I   CO4- App   (8)
ampere. Length of solenoid is L. Cross section area is A. Calculate
inductance of the solenoid also magnetic field intensity inside the solenoid.

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