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

Question Paper Code: 44403

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

Fourth Semester

Electronics and Communication Engineering

14UEC403 - ELECTROMAGNETIC FIELDS

(Regulation 2014)

Duration: 1:15hrs Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. A field F is said to be SOLENOIDAL if

   (a) CURL F=0 (b) DIV F=0 (c) $\nabla^2 F = 0$ (d) $\int$ F.dl = 0

2. Two Positive charges Q Coulomb each are placed at points (0, 0, 0) and (2, 2, 0),while two negative charges Q Coulomb each in magnitude are placed at points (0, 2, 0) and (2, 0, 0).The electric field at point (1, 1, 0) is

   (a) Zero (b) $\frac{Q}{8\pi\varepsilon 0}$ (c) $\frac{Q}{4\pi\varepsilon 0}$ (d) $\frac{Q}{16\pi\varepsilon 0}$

3. The Magnetic field at any point on the axis of a current carrying circular coil will be

   (a) Perpendicular to the axis (b) Parallel to the axis
   (c) At an angle of 45 degree with the axis (d) Zero

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5. Point form of Ohm's law is

   (a) $\vec{E} = \sigma\ \vec{J}$ (b) $\vec{J} = \sigma\ \vec{E}$ (c) $\vec{E} = \vec{J}$ (d) $\vec{E} = \frac{\sigma}{\vec{J}}$

6. In a dielectric-conductor boundary, the tangential component of electric field is

(a) E_i (b) $2E_i$ (c) 0 (d) Infinity

7. The Coefficient of coupling between two coils

(a) Orientation of the coils (b) Current
(c) Number of turns on the two coils current (d) Self-inductance of the two coils

8. Give the equation of power flow in coaxial cable

(a) Poynting Vector (b) Scalar Vector
(c) Radial Vector (d) none of these

9. In a good conductor E/H ratio is

(a) Real
(b) Imaginary
(c) Has a phase of 45 degree
(d) Has no relevance,(i.e) E is independent of H

10. Skin depth is proportional to

(a) Frequency (b) permeability (c) $\sqrt{\sigma}$ (d) $1/\sqrt{\sigma}$

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Determine the electric field intensity of an infinitely long, straight, line charge of a uniform density ρ_L in air. (8)

12. Find the magnetic flux density around infinitely long straight conductor using Bio-Savart law. (8)

13. A cylindrical capacitor consists of an inner conductor of radius '*a*' and an outer conductor whose inner radius is '*b*'. The space between the conductor is filled with a dielectric of permittivity ε, and the length of the capacitor is *L*. Determine the capacitance of this capacitor. (8)

14. Derive the Poynting vector from Maxwell's equations and explain power of flow. (8)

15. Define Brewster angle. Derive the wave equation in free space condition. (8)