Total No. of Questions : 4]

SEAT No. :

PC49

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[6360]-50

T.E. (Electronics and Telecommunication) (Insem)
ELECTROMAGNETIC FIELD THEORY
(2019 Pattern) (Semester - I) (304182)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4.***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of electronic pocket calculator and smith chart is allowed.***
5) ***Assume suitable data if necessary.***

Q1) a) Derive an expression for electric field intensity **E** at any point P due to infinite long line charge with density ρ_L C/m. **[7]**

b) Determine total electric field intensity **E** at origin due to following charge distributions present in free space. **[8]**

i) Point charge of 12 nc at (–2, 0, 6)

ii) Uniform surface charge density 0.3 nC/m^2 at Z = 2.

OR

Q2) a) State and prove the Gauss law. **[7]**

b) A Point charge of 5 nC is located at origin. If V = 2 V at (0, 6, –8), find: **[8]**

i) Potential at A (3, 2, 6)

ii) Potential at B (1, 5, 7)

iii) Potential difference V_{AB}

Q3) a) Find the expression for **H** due to an infinite long straight filament carrying direct current. **[7]**

b) State and explain : **[8]**

i) Biot's Savart Law

ii) Ampere's circuit law.

OR

Q4) a) Obtain the expression for **H** along the axis of a circular conductor carrying current **I**. **[7]**

b) Find magnetic field intensity **H** at P(0, 0.2, 0) due to three current sheets of current density 2.7 a_x A/m at y = 0.1; –1.4 a_x A/m at y = 0.15 and –1.3 a_x A/m at y = 0.25. **[5]**

c) State the Maxwell's equation for static magnetic field in point form and integral form. **[3]**