Total No. of Questions : 6]

SEAT No. :

[Total No. of Pages : 2

P24

Oct.-16/TE/Insem.-23
T.E. (E & TC) (Semester - I)
Electromagnetics & Transmission lines
(2012 Pattern)

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

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4,Q5 or Q6.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***
5) ***Use of calculator is allowed.***

Q1) a) State & prove gauss law. Also write significance of gaussian surface. **[5]**

b) Derive the expression for electric field intensity $\bar{E}$ due to uniform sheet charge 'ρ_s'. **[5]**

OR

Q2) a) State & prove divergence theorem for electrostatic field. **[5]**

b) A uniform line charge of 2 μc/m is located on z axis. Find $\bar{E}$ at point P(1,2,3) if line charge extends from -∞ to ∞. **[5]**

Q3) a) Derive the electrostatic boundary conditions for electric field at an interface between conductor & free space. **[6]**

b) Derive an expression for capacitance of spherical plate capacitor. **[4]**

OR

Q4) a) For a parallel plate capacitor, area of plate A = 120 cm^2, Spacing between plates d = 5mm separated by dielectric of $\in_r$ = 12, connected to 40 volt battery. Find **[5]**

i) Capacitance

ii) E

iii) D

iv) Energy stored in capacitor

b) Write poisson's & Laplace's equations & its significance **[5]**

P.T.O.

Q5) a) State & Prove stokes theorem of magnetostatics **[4]**

b) Give the $\overline{H} = Z_0 r^2 \overline{a}_\phi A/m$. Determine the current density. Explain the significance of curl. **[6]**

OR

Q6) a) Derive the boundary condition at an interface between two magnetic medium. **[6]**

b) State & prove Biot-savart's law of magnetostatics. **[4]**