TE| ETRX | VI | CBGS | EME | 13/05/15
Sub:- Electromagnetic Engineering
Date: 13/05/2015

Q.P.Code No. : 3302

(3 Hours) [Total Marks : 80

Instructions:

1. Question no 1 is compulsory
2. Solve any three from Question no 2 to Question no 6
3. Assume suitable data if required
4. Right figures indicate the marks

1. Attempt any four : 20

(a) Point charges Q_1=300μC located at (1,-1,-3) m experiences a force $\overline{F1} = 8\overline{ax} - 8\overline{ay} + 4\overline{az}\ N$ due to point charge Q_2 at (3,-3,-2)m. Determine Q_2

(b) Explain isotropic, omnidirectional and directional antenna with suitable examples

(c) Compare MOM, FEM and FDM

(d) Find out the divergence and curl of the following function $\bar{A}$=2xy $\overline{ax}$+(x^2 z)$\overline{ay}$+z^3 $\overline{az}$

(e) Explain skip distance with the formula

2. Answer the following questions : 20

(a) Derive Maxwells integral and point form equations for static fields

(b) Find electric field intensity $\bar{E}$ due to an infinite line charge carrying current I

3. Answer the following questions : 20

(a) Define the polarization of wave. Explain different types of polarization

(b) Derive wave equations for free space and for conducting media

4. Answer the following questions : 20

(a) Explain in detail FDM method also state advantage and drawback of it.

(b) State and derive the poynting theorem and describe the significance of each term

5. Answer the following questions : 20

(a) Explain the significance of the term 'effective area of an antenna'. Derive the relationship between effective area and directivity of any antenna

(b) Explain the principle modes of operation of helical antenna and draw its radiation pattern

6. Attempt any two : 20

(a) Classify and explain different types of wave propagation.

(b) Explain folded dipole antenna and its applications

(c) Explain following terms critical frequency, virtual height, maximum usable frequency

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