S.E. EXTC IV (CBGS) 9/12/14
Wave theory & Prop.

QP Code : 12521

(3 Hours) **[Total Marks :80**

N.B. : (1) Question No **1** is **compulsory**.
(2) Attempt any **three** out of remaining five.
(3) Assume suitable **data** wherever **necessary** and **justify** the **same.**
(4) **Figures** to the right indicate **full** marks.

1. Attempt any four out of the **five** :–
   (a) Write integral from of Ampere's Law and interprete the same. **5**
   (b) Define Intrinsic Impedance. Calcualte its value for free space. **5**
   (c) Give and explain various steps involved in finding characteristic impedance for microstrip line using finite difference Method. **5**
   (d) What do you mean by Depth of pentration. **5**
   (e) What is "loss Tangent". Explain how it classifies lossless dietlectrics, lossy Dielectric and good conductor. **5**

2. (a) Derive Maxwell's equation in point form and integral form. **10**
   (b) Compare FDM, FEM & MOM. **5**
   (c) Compare scalar and vector potential. **5**

3. (a) In certain Medium $\bar{E} = \left[10e^{-0.05x}\sin\left(2\times10^{8}t - 2x\right)\right]\bar{a}_z v/m$ Find : **10**
      (a) Propagation constant.
      (b) Wavelength
      (c) Speed of wave
      (d) Skin Depth.

   (b) Derive wave equation for good dielectric medium. **5**
   (c) Give Boundary conditions for Electric and magnetic field for itnerface between good conductor and dielectric. **5**

4. (a) Use method of moment to find the capacitance of parallel plate capacitor of figure 1. Take a = 1 meter; b = 1 meter; d = 1 meter and $\varepsilon_r = 1$. **10**

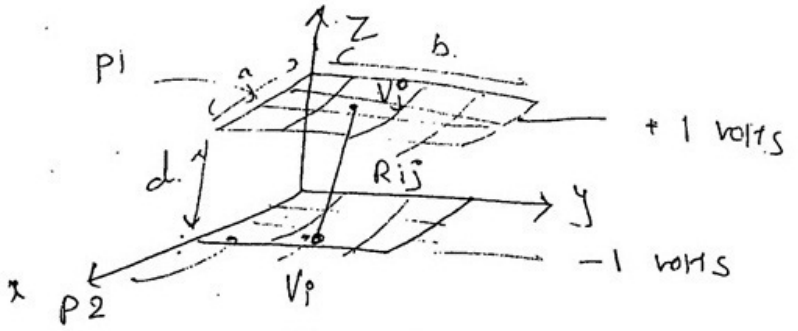

Figure - 1

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(b) Derive an expression for magnetic field intensity due to finite long straight element. 10

5. (a) What do you mean by Fading ? How it can be minimized ? 5
(b) Write a short note on Ionospheric Propagation. 5
(c) Explain Super Refraction and Tropospheric Fading. 10

6. (a) Prove that static electric field is irrotational and static magnetic field is solenoidal. 10
(b) Explain Reflection of Uniform Plane wave at Oblique Incidence. 10

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