B.Tech II Year - II Semester Examinations, April/May-2012
EM WAVES AND TRANSMISSION LINES
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 hours   **Max. Marks: 80**

Answer any five questions
All questions carry equal marks
- - -

1.a) State and explain Poisson's and Laplace's equations.
 b) Evaluate the capacitance of concentric cylindrical conductors in terms of their dimensions. [16]

2.a) State and explain Ampere's force law.
 b) Explain the equation $\nabla \times H = J$ in detail. [16]

3.a) Define Maxwell's equation in Integral and Differential form.
 b) Name the different boundary conditions between two surfaces. [16]

4.a) Derive the wave equation in a Dielectric medium and solve the same for a uniform plane wave propagation.
 b) What are good conductors and good dielectrics? Explain their properties. [16]

5.a) What are TE, TM and TEM modes of wave propagation and compare their properties.
 b) Define the term 'cut off frequency' and explain. [16]

6.a) What are primary and secondary parameters of Transmission lines? Explain.
 b) Derive an expression for the propagation constant and characteristic Impedance of transmission line with R, L, C, G. [16]

7.a) Derive an expression for the Input impedance of a lossless line of length 'l' in terms of Z_0, β, Z_L and l when terminated by a load Z_L.
 b) A lossless transmission line of length 'l' with $Z_0 = 50$ is terminated by a load of $50+j50 = Z_L$. Determine the Reflection coefficient "R_r" and the standing wave Ratio 'S'. [16]

8. Write short notes on any two
  a) Smith's Impedance chart
  b) Single stub matching
  c) Properties of open circuited and short circuited Transmission lines. [16]

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