

Code: R7220405



B.Tech II Year II Semester (R07) Supplementary Examinations December/January 2015/2016 EM WAVE & TRANSMISSION LINES

(Electronics & Communication Engineering) (For 2008 regular admitted batch only)

Time: 3 hours

Max. Marks: 80

Answer any FIVE questions All questions carry equal marks

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- 1 (a) Derive the expression for capacitance of spherical capacitor.
 - (b) Find the capacitance of a parallel plate capacitor if the plates are of area 1.5 m², the distance between the plates is 2 mm, potential gradient is 10^5 V/m and ρ_s as 2.5 μ C/m².
- 2 (a) Briefly explain about Forces due to magnetic fields.
 - (b) Given the general vector field A = 5r sin Φ a_z in cylindrical coordinates, find curl A at (2, π , 0).
- 3 (a) Discuss in brief about transformer and motional electromotive forces.
 - (b) Write short notes on the inconsistency of Ampere's law.
- 4 (a) Define uniform plane wave and explain briefly.
 - (b) Explain the wave propagation in lossy dielectrics.
- 5 (a) Using Poynting theorem find the expression for power flow in a coaxial cable.
 - (b) A uniform plane wave is normally incident from air in to a medium of $\varepsilon_r = 4$, $\mu_r = 1.21$. Determine the reflection and transmission coefficients for E and H fields.
- 6 (a) Explain impossibility of TEM wave propagation in wave guides.
 - (b) For a parallel plane wave guide having z-propagation, explain the nature of variation and sketch the variation of E and H for TM10 waves.
- 7 (a) Derive the expressions for α and β in terms of primary constants of a line.
 - (b) A distortionless line at 150 MHz has $Z_0 = 75 \Omega$, $\alpha = 0.06$ np/m and $u = 2.8 \times 10^8$ m/s. Calculate the parameters R, L, G and C.
- 8 (a) Discuss in brief about double stub impedance matching on a line.
 - (b) Write short notes on the Half-wave line.
