

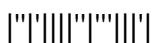
II B. Tech II Semester Supplementary Examinations, February - 2022
ELECTROMAGNETIC WAVES AND TRANSMISSION LINES
 (Electronics Communication Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions each Question from each unit
 All Questions carry **Equal** Marks

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- 1 a) Define input impedance of a transmission line and derive the expression for it. [8M]
 b) A high frequency line has the following primary constants $L=1.2$ mH/Km, $C=0.05\mu\text{F/Km}$. $R = G =$ negligible. Determine the characteristics impedance and propagation constant of the line. [7M]
- Or
- 2 a) Derive the relationship between secondary constant and primary constants of a transmission line. [8M]
 b) For lossless line, $Z_0 = 50 \Omega$ and $u = 2.8 \times 10^8$ m/s. Determine L and C for the line. [7M]
- 3 a) Explain the significance and design of single stub impedance matching. Discuss the factors on which stub length depends? [8M]
 b) By using smith chart, Find the input impedance of 75Ω loss less transmission Line of length 0.1λ , when the load is short. [7M]
- Or
- 4 a) A transmission line of 100Ω characteristics impedance is connected to a load of 400Ω . Calculate the reflection coefficient and standing wave ratio. [8M]
 b) List out different types of transmission lines and write their applications. [7M]
- 5 a) State Coulomb's law, force between any two point charges, and indicate the units of the quantities in the force equation. [8M]
 b) Prove that the energy stored in capacitor $W = \frac{1}{2} CV^2$ Joules. [7M]
- Or
- 6 a) State Gauss law. Apply Gauss law to calculate the electric field both inside outside of an insulating sphere of radius r, a uniform charge density ρ and a total positive charge Q . [8M]
 b) Define potential difference? Mention the characteristics of potential difference? [7M]
- 7 a) What is the inconsistency in Ampere's law? How is it rectified by Maxwell? [8M]
 b) Differentiate Conduction and Displacement currents. And show that the displacement current through the capacitor is equal to the conduction current. [7M]
- Or
- 8 a) State Ampere's circuital law. Specify the conditions to be met for determining magnetic field strength \mathbf{H} based on Ampere's circuital law. [8M]
 b) Write down the integral and differential forms of Maxwell's equations and write their physical significance. [7M]



- 9 a) For a conducting medium derive expressions for α and β . [8M]
b) Write short notes on the following [7M]
(a) Brewster angle (b) Total Internal Reflection.
- Or
- 10 a) Explain the difference between the Intrinsic Impedance and the Surface Impedance of a conductor. Show that for a good conductor, the surface impedance is equal to the intrinsic impedance. [8M]
b) Define and distinguish between the terms perpendicular polarization, parallel polarization, for the case of reflection by a perfect conductor under oblique incidence. [7M]

