

ANURAG Engineering College
(An Autonomous Institution)

II B.Tech II Semester Supplementary Examinations, December-2024
ELECTROMAGNETIC THEORY AND TRANSMISSION LINES
(ELECTRONICS AND COMMUNICATIONS ENGINEERING)

Time: 3 Hours

Max. Marks: 75

Section – A (Short Answer type questions)**(25 Marks)****Answer All Questions**

	Course Outcome	B.T Level	Marks
1. Define electric flux and give the relation between electric field intensity and electric flux density?	CO1	L1	2M
2. State Gauss's law?	CO1	L1	3M
3. State Ampere's Force law?	CO2	L1	2M
4. Define magnetic vector potential and magnetic scalar potential?	CO2	L1	3M
5. Define displacement current density.	CO3	L1	2M
6. List the boundary conditions for Magnetic fields?	CO3	L1	3M
7. Obtain wave equations for good conductors?	CO4	L2	2M
8. Give the expression for reflection coefficient for vertical polarization with oblique incidence?	CO4	L1	3M
9. Draw the equivalent circuit of the transmission line?	CO5	L1	2M
10. What are the properties of stub matching?	CO5	L1	3M

Section B (Essay Questions)**Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

11. A) Derive the expression for electric field intensity due to the line charge?	CO1	L3	10M
OR			
B) Point charges 5nC and -2nC are located at (2, 0, 4) and (-3, 0, 5) respectively. i) Calculate the electric force on a 1nC point charge located at (1, -3, 7). ii) Find electric field intensity E at (1,-3, 7).	CO1	L3	10M
12. A) State Biot-Savart's law and obtain the expression for magnetic field intensity at a point P due to line current element?	CO2	L3	10M
OR			
B) Describe in detail the Faraday's law of induction. Write down the mathematical statement of this law?	CO2	L2	10M
13. A) State Faraday's law. Derive the expression for Maxwell's equation of time varying fields.	CO3	L3	10M
OR			
B) Derive expression for Reflection and Transmission coefficients of an EM wave when it is incident normally on a dielectric-dielectric interface.	CO3	L3	10M
14. A) Define Brewster angle and derive an expression for Brewster angle when a wave is parallelly polarized?	CO4	L2	10M
OR			
B) Write short Notes on i) Total internal reflection ii) Brewster Angle	CO4	L2	10M

15. A) From the fundamental voltage & current equations of transmission line, derive Expression for input impedance Z_{in} of the line. Modify the expression for lossy & lossless cases. CO5 L3 10M
- OR**
- B) Explain the significance and design of single stub impedance matching. Discuss the factors on which length depends? CO5 L2 10M