

**JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT**  
**TEST - 1 EXAMINATION - 2025**  
**B.Tech-V Semester ( ECE )**

COURSE CODE(CREDITS): 18B11EC513(4)

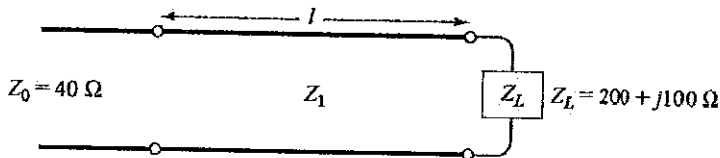
MAX. MARKS: 15

COURSE NAME: Electromagnetic Waves

COURSE INSTRUCTORS: SRU

MAX. TIME: 1 Hours

Note: (a) All questions are compulsory. (b) The candidate is allowed to make suitable numeric assumptions wherever required for solving problems.

Q.No	Question	CO	Marks
Q.1	Derive the Telegrapher's equations for a distributed Transmission line.	CO-4	3
Q.2	A transmission line has the following per-unit-length parameters: $L = 0.5 \mu\text{H/m}$ , $C = 200 \text{ pF/m}$ , $R = 4.0 \Omega/\text{m}$ , and $G = 0.02 \text{ S/m}$ . Calculate the propagation constant and characteristic impedance of this line at 800 MHz. Recalculate these quantities in the absence of loss ( $R = G = 0$ ).	CO-4	2
Q.3	Give the expression for the input impedance of transmission line, whose characteristic impedance is $Z_0$ , terminated with a load impedance of $Z_L$ . Derive the input impedance of the quarter-wave length transmission line segment.	CO-5	3
Q.4	Use the Smith chart to find the reflection at the load, VSWR and input impedance at the junction between $Z_0$ and $Z_1$ if $Z_1 = 100 \Omega$ . Consider $l = 0.3\lambda$ . Determine the distance at which voltage minimum will occur.  	CO-5	4
Q.5	A load impedance $Z_L = 90 + j60 \Omega$ is to be matched to a $75 \Omega$ . Clearly indicate the movement on the Smith Chart to design an L-shaped matching circuit.	CO-5	3