JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST - 3 EXAMINATION 2025

PH.D -II SEMESTER (ECE)

COURSE CODE(CREDITS):18P1WGE101(3) MAX. MARKS: 25

COURSE NAME: RESEARCH METHODOLOGIES INCL QUANTITATIVE METDS & COMP APPLS

COURSE INSTRUCTORS:SRU MAX. TIME: 2 HOURS

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

Q.No	Question	CO	Marks
Q.1	Why do you need the lumped-element circuit model for a transmission line? What is/are the main difference/s between lumped-circuit model and distributed parameter model?	CO-2	3
Q.2	How can you realize and an inductor and a capacitor in order to design a filter using the open circuited and short circuited transmission line segments? Explain this using the mathematical equations.	CO-3	3
Q.3	What do you mean by Return Loss, Insertion Loss and Standing Wave Ratio? Is there any relationship among these three for a lossless network? What is the significance of return loss?	CO-3	3
Q.4	Explain the filter design by the image parameter method with respect to constant-k, m-derived and composite filters.	CO-4	4

Q.No	Question	CO	Marks
Q.5	Is there any way to convert a prototype low-pass filter into a high-pass filter? Explain with mathematical transformations how a prototype low-pass filter can be converted into bandpass, band reject and all-pass filters.	CO-4	3
Q.6	What do you mean by Canonical Coupled Line Circuit? How these can be used in the design of bandpass filter?	CO-5	4
Q.7	Explain the following terms in brief. a) ABCD parameters and Z-parameters b) Resonator and Coupler c) Quarter-wave transformer and Half-wave Transformer d) Maximally Flat filter and Equal-ripple filter e) Impedance and Admittance Inverters	CO-5	5