JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2024

Ph.D. I Semester (CSE/IT/ECE/CE/BT/BI)

COURSE CODE (CREDITS): 18PIWGE101 (3)   MAX. MARKS: 25

COURSE NAME: RESEARCH METHODOLOGIES INCLUDING QUANTITATIVE

METHODS AND COMPUTER APPLICATIONS

COURSE INSTRUCTORS: Dr. Harsh Sohal   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

Q. No.	Question	Marks
Q1	How do deep submicron technologies impact the design of VLSI circuits? Discuss the effects of scaling down transistor sizes and how designers address challenges such as noise, leakage, and interconnect delays.	5
Q2	What are the different classification algorithms available in MATLAB? How will you handle imbalanced dataset in machine learning?	5
Q3	Discuss the concept of FPGA resource utilization and how it impacts the efficiency of a digital design. What strategies can be used to optimize resource utilization in FPGA designs?	5
Q4	What are some advanced reconfigurable architectures' applications in emerging technologies such as machine learning, artificial intelligence, or 5G networks? Discuss the specific advantages of using FPGA in these domains.	5
Q5	Describe the idea of FPGA parallelism and how digital systems performance can be maximized by utilizing it. Give instances of uses for FPGA parallelism that demonstrate its substantial benefits over conventional CPUs.	5