JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1EXAMINATION- 2025

M.Tech-II Semester (CSE/IT)

COURSE CODE (CREDITS):10M11CI211 (3)

MAX. MARKS: 15

COURSE NAME: Advanced Algorithms

COURSE INSTRUCTORS: Dr. Aman Sharma

MAX. TIME: 1 Hour

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

Q1	int a = 0, b = 0;
	for (i = 0; i< N; i++) {
	a = a + rand();
	}
	for (j = 0; j < M; j++) {
	b = b + rand();
	}
		1	1*4

	inti,j,k=0;
	for(i=n/2;i<=n;i++){
	for(j=2;j<=n;j=j*2){
	k=k+n/2;
	}
	}		

	for(inti=1;i<n;i++){
	i*=k;
	}		

	inti,j,k=0;
	for(i=n/2;i<=n;i++){
	for(j=2;j<=n;j=j*2){
	k=k+n/2;
	}
	}		

Q2	Consider the following three functions. $f_1 = 10^n$ $f_2 = n^{\log n}$ $f_3 = n^{\sqrt{n}}$ Which one of the following options arranges the functions in the increasing order of asymptotic growth rate?	2	2
Q3	Find the Time Complexity using Master Theorem: $T(n)=2T(\sqrt{n}) + 1$	2	2
Q4	Analyze the time complexity of Quick sort. Write recurrence relation and derive its average, worst, best case time complexity.	2	3
Q5	Given a sorted array of non-negative distinct integers, find the smallest missing non-negative element in it. Write pseudocode for the same. Input: [0, 1, 2, 6, 9, 11, 15] Output: 3	3	4

	Input: [1, 2, 3, 4, 6, 9, 11, 15] Output: 0 Input: [0, 1, 2, 3, 4, 5, 6] Output: 7		

**********Best of Luck**********