JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

B.Tech-II Semester (CSE/IT/ECE/CE/BT/BI)

COURSE CODE (CREDITS): 24B11CI211 (03) MAX. MARKS: 15

COURSE NAME: Data Structures and Algorithms MAX. TIME: 1 Hour

COURSE INSTRUCTORS: Dr. (Amit, Ravindra, Amol, Kushal, Monika, Ruchi) Mr. Faisal

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No		CO	Marks
Q1	Consider the following C declaration: struct {short s[5]; union {float y; long z; }u; }t; Assume that objects of the type short, float and long occupies 2 bytes, 4 bytes and 8 bytes respectively. Mention the size of object 't' in bytes.	1	1
Q2	Suppose you want to find the middle node of a linked list with single loop, mention the logic/notation only.	3	1
Q3	Write the condition of Empty Header Linked List and also mention the notation to merge two linked list into any of them.	1	1
Q4	A machine took 200 sec to sort 200 names using Bubble sort. In 800 sec, how many names it can sort approximately.	6	2
Q5	Write a procedure to merge two arrays into third array with an example.	2	2
Q6	a) Suppose that you are multiplying two polynomials which are represented by two linked lists. Then how the values of coefficient and the exponent are obtained and added into the third linked list. b) Mention the structure of a linked list node to represent sparse matrix.	1 1	1 1

Q7	a) Consider the following C function:
	int f (int n)
	{ static int i = 1;
	if (n > 5) return n;
	n = n + i; i++;
	return f(n); }
	The value returned by f(1) is:
	b) Mention the complexity of the given loop:
	for (i = 0; i < n; i++)
	{
	p = n; //Assume p is declared outside the for loop
	while (p! = 0)
	{ p = p ÷ 2;
	} }
		2
		2
			2
			1

Q8	a) Assume that all operators are left associative except the ^ which is right associative. Find out the postfix expression for the given infix expression: A ^ B ^ C ^ D + E ^ F ^ G * H – J ÷ K b) A single array A [1…MAXSIZE] is used to implement two stacks. The two stacks grow from opposite ends of the array. Variables top1 and top2 (top1 < top2) point to the location of the topmost element in each of the stacks, If the space is to be used efficiently, then write the condition for "**stack overflow**" and defend your answer?	4 4	2 1