PVP 20

Code: 20ES1502

III B.Tech - I Semester – Regular / Supplementary Examinations
NOVEMBER 2023

DATA STRUCTURES AND ALGORITHMS
(ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	What is Recursion? What are the advantages of Recursion? Explain the types of Recursion.	L2	CO1	7 M
	b)	Explain about the asymptotic notations with an example for each.	L2	CO1	7 M
OR					
2	a)	Write the procedure and the ways to implement insertion and deletion of a node in a single linked list.	L2	CO2	7 M
	b)	Write and explain deletion operations in circular linked list with pictorial representation.	L2	CO2	7 M

UNIT-II					
3	a)	Using recursive function for fibbonacci series, explain the execution of the function call fibbonacci(7) using stack.	L3	CO2	7 M
	b)	Convert the following infix expression (X + Y) *(P – Q) / R to postfix expression using stack.	L3	CO4	7 M
OR					
4	a)	Write the procedure to perform Queue ADT.	L3	CO2	7 M
	b)	Give the empty condition and full condition in array implementation of queue.	L3	CO2	7 M
UNIT-III					
5	a)	Construct Tree from given Inorder and Preorder traversals Inorder sequence: D B E A F C Preorder sequence: A B D E C F	L3	CO4	7 M
	b)	Develop the routines to get Pre-order, Post-order, Inorder in a Binary Search tree.	L2	CO2	7 M
OR					
6	a)	Define BST and Construct a BST by inserting 30, 10, 4, 19, 62, 35, 28, 73 into an initially empty tree.	L3	CO4	7 M
	b)	Write and explain BFS algorithm with an example.	L2	CO2	7 M

UNIT-IV					
7	a)	Prove that the time complexity of merge sort is O(nlogn)	L4	CO5	7 M
	b)	Explain Quick sort with algorithm.	L2	CO3	7 M
OR					
8	a)	Illustrate the job sequencing with deadlines problem with an example. Give the greedy solution.	L3	CO3	7 M
	b)	Explain the single source shortest path problem with suitable example.	L2	CO3	7 M
UNIT-V					
9	a)	What is All Pair Shortest Path problem (APSP)? Discuss the APSP algorithm and discuss the analysis of this algorithm.	L2	CO3	7 M
	b)	Find the optimal solution for 0/1 knapsack problem by using Dynamic Programming approach when n=4 , m=15, (w1,w2,w3,w4) = (10,15,6,9) and (p1,p2,p3,p4)=(2,5,8,1)	L3	CO3	7 M
OR					
10	a)	Solve the Travelling Salesman problem using dynamic programming technique.	L3	CO3	7 M
	b)	State the advantages and properties of dynamic programming strategy.	L2	CO3	7 M