PVP 20

Code: 20ES1502

III B.Tech - I Semester – Regular Examinations - DECEMBER 2022

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)	Explain Asymptotic Notation with a neat diagram & example.	L2	CO1	7 M
	b)	Write a program to create a circular linked list and search for a given element and append it to the end of the list.	L2	CO1	7 M
OR					
2	a)	Explain the notation of an algorithm & its properties.	L2	CO1	7 M
	b)	Discuss with an example the process of reversing a single linked list.	L4	CO4	7 M
UNIT-II					
3	a)	Define the Abstract data type for Queue. Write algorithms to implement Queue ADT using arrays.	L2	CO2	7 M

	b)	Write an algorithm for Evaluation of postfix expression with example. 5 3 + 6 2 / * 3 5 * +	L2	CO2	7 M
OR					
4	a)	What is the advantage of circular queue over linear queue?	L2	CO2	7 M
	b)	Explain the algorithm for balancing of parenthesis with an example using stacks.	L3	CO3	7 M
UNIT-III					
5	a)	Create Binary Tree and Binary Search Tree from the following lists of data items. 30, 20, 35, 95, 15, 60, 55, 25, 5, 65, 70, 10, 40.	L3	CO2	7 M
	b)	Write program for recursive In-order, pre-order & post-order traversal of binary search tree.	L2	CO3	7 M
OR					
6	a)	Explain about the procedure for BFS.	L2	CO3	7 M
	b)	Explain various representations of a graph with suitable examples.	L2	CO3	7 M
UNIT-IV					
7	a)	Write the Merge sort algorithm and sort the following elements. 41, 55, 34, 25, 15, 10, 48, 52, 69, 86.	L2	CO4	7 M
	b)	Write the procedure to implement binary search to search an element in an array and its time complexity with an example.	L2	CO4	7 M

		OR			
8	a)	Explain solution to knapsack problem using Greedy method.	L2	CO4	7 M
	b)	Write about single source shortest path problem.	L3	CO4	7 M
		UNIT-V			
9	a)	Solve the following 0/1 knapsack problem by dynamic programming approach. Knap sack with n=4 and m=8. P = {1,2,5,6} W = {2,3,4,5}.	L4	CO5	7 M
	b)	Write the general method of dynamic programming.	L2	CO5	7 M
		OR			
10	a)	Write an algorithm for All Pairs Shortest Path Problem. Evaluate its time complexity.	L2	CO5	7 M
	b)	How do you solve travelling sales man problem using dynamic programming? Explain with an example.	L4	CO5	7 M