Code No: P18CST02

R18

HALL TICKET NUMBER

PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE
(AUTONOMOUS)
II B.TECH I SEMESTER END SUPPLEMENTARY EXAMINATIONS, MARCH/APRIL - 2023
DATA STRUCTURES
(Common to ECE,CSE,CSIT,IT,CSE(IOTCSBT),AIDS, AIML Branches)

Time: 3 hours Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

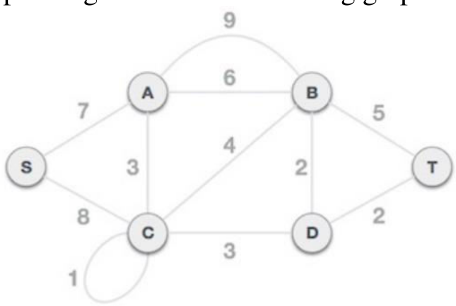
Answer all the questions in Part-A (5X2=10M)

Q.No.		Questions	Marks	CO	KL
1	a)	Compare and contrast binary and tail recursions.	[2M]	1	2
	b)	Define stack. Write the pseudo code to perform the push operation on the stack.	[2M]	2	3
	c)	Discuss the priority queue in brief.	[2M]	3	2
	d)	Mention the properties of the binary search tree. Give one example of a binary tree.	[2M]	4	2
	e)	Write the problem statement for Dijkstra's shortest path.	[2M]	5	2

PART-B

Answer One Question from each UNIT (5X10=50M)

Q.No.		Questions	Marks	CO	KL
		UNIT-I			
2.	a)	Define binary search and explain its working principle with an example.	[5M]	1	2
	b)	Discuss asymptotic notations with a suitable example.	[5M]	1	2
		OR			
3.	a)	Explain the space and time complexity of an algorithm with an example.	[5M]	1	2
	b)	Write an algorithm to generate the Fibonacci sequence using recursion.	[5M]	1	2
		UNIT-II			
4.		Write the algorithm for merge sort. Sort the following list of elements by using merge sort. 26, 6, 32, 19, 6, 20, 21, 34, 49	[5M]	2	2
		OR			
5.		Convert the following infix expression into a postfix expression A-(B/C + (D%E *F)/G) * H Write the steps of the algorithm.	[5M]	2	3
		UNIT-III			
6.		What is the limitation of a simple queue? Write a 'C' program to implement the basic operations of a circular queue.	[10M]	3	3
		OR			
7.		Illustrate an algorithm to insert a new node at the beginning, at the middle position, and at the end of the singly linked list.	[10M]	3	2
		UNIT-IV			
8.	a)	Discuss the operations that can be performed on binary trees.	[5M]	4	2
	b)	What is an AVL tree? Explain the balance factor associated with a node of an AVL tree.	[5M]	4	2
		OR			

9.	a)	For a binary tree T, the pre-order, and in-order traversal sequences are as follows. Pre-order: A B L M K N P Q In order: L B M A N K P Q Draw a binary Tree.	[7M]	4	3
	b)	Compare and contrast the B tree and the B+ tree.	[3M]	4	2
UNIT-V					
10.		Write an algorithm to perform the Depth-First Search technique on the graph. Illustrate with an example.	[10M]	5	2
OR					
11.		Write Kruskal's algorithm to find the minimal spanning tree for the given graph. Find the minimal spanning tree for the following graph. 	[10M]	5	3

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