Exam.Code:0915
Sub. Code: 33421

2125

B.E. (Computer Science and Engineering)
Third Semester
CS-301: Data Structures

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

I	**a**	What advantages does a doubly linked list have over linear linked list?	2
	b	What is the difference between stack and queue?	2
	c	Compare and contrast between a binary tree and a binary search tree.	2
	d	What do understand by Max Heap?	2
	e	What are minimum spanning trees?	2

Section - A

II	**a**	Write algorithms to perform the following operations using a double linked list. i) insertion at the beginning ii) insertion after a given node iii) deletion at the beginning.	6
	b	What do you mean by time-space trade-off among algorithms? Discuss Big O notation in detail.	4
III	**a**	What are abstract data types? Explain operations of stack data structure using suitable examples.	6
	b	Define Queue. Write an algorithm for enqueue operation on a circular queue.	4
IV	**a**	Write a program to sort an array of integers in ascending order using Insertion sort.	6
	b	Explain the basic idea of Quick sort using suitable example.	4

P.T.O.

Section - B

V **a** For a binary tree T, the Preorder and Inorder traversal sequence are as follows: 5

Preorder: A, B, L, M, K, N, P, Q
Inorder: L, B, M, A, N, K, Q, P

i) Draw the Binary Tree

ii) What is the postorder traversal sequence?

b Write an algorithm for deleting an element from heap. 5

VI **a** What is AVL tree? How an AVL tree different from a binary tree. Build an AVL tree with the values: 15, 20, 24, 10, 13, 7, 30, 36, 25 6

b List the properties of B^+ trees. How it is different from B trees? 4

VII **a** What are different methods of representing Graphs? Discuss Breadth First search algorithm in detail. 5

b What is hash table? Discuss open addressing techniques to avoid collision during hashing. 5

x-x-x