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Roll No.	Total No. of Pages:02
Total No. of Questions : 09	
B.Tech.(Electronics & Comp. Engg.) (2011 Onv	wards) (Sem.–4)
DATA STRUCTURES	
Subject Code : BTCS-304	
Paper ID:[A2022]	
Time:3 Hrs.	Max. Marks:60

INSTRUCTION TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- a. Which data structure is used to perform recursion? Explain.
- b. When is a binary search best applied?
- c. What is sorting? List any four sorting techniques.
- d. What are Dynamic Data Structures?
- e. Differentiate between LIFO and FIFO.
- f. What are doubly linked lists?
- g. Convert the expression $((A + B) * C (D E)^{(F + G)})$ to equivalent Prefix notation.
- h. Explain whether Linked List is linear or Non-linear data structure.
- i. Write an algorithm/program to find Factorial of a number using recursion.
- j. What are Sparse Matrices?



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SECTION-B

- 2. What is an array? Write an algorithm to insert an element in an array.
- 3. What is complexity of an algorithm? How is it measured? Discuss Time space trade off with an example.
- Explain Depth First Search algorithm in a graph with the help of an example. 4.
- 5. What is meant by collision resolution in Hashing? Explain any one strategy for dealing with it.
- 6. Explain the concept of Memory Leak and Dangling Pointers.

SECTION-C

7.	Sort the following data using Quick Sort :	(10)
	10 23 64 21 74 95 02 59 50 86 58	
8.	Explain and write an algorithm to perform the following operation on a singly linked list.	
	a. Insert new node at the beginning of list.	(3)
	b. Insert new node at Middle.	(3)
	c. Delete a node in the middle of the list.	(4)
9.	Illustrate the following operations of Binary tree with algorithms :	(10)
	a. Insertion	
	b. Deletion	

- b. Deletion
- c. Searching