

Roll No. ....

Total Pages : 3

**205605**

**May, 2019**

**B.Tech. (ECE) - 6th Semester  
DATA STRUCTURE(EC-310-C)**

Time : 3 Hours]

[Max. Marks : 75

*Instructions :*

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

**PART-A**

1. (CO1) (a) Write the code for trace of a matrix but its time complexity should be  $\theta(n)$ . (1.5)
- (CO1) (b) Differentiate between non linear and linear data types. (1.5)
- (CO3) (c) How are binary trees stored in array form in memory? (1.5)
- (CO4) (d) Give the advantages of hashing over linear search. (1.5)
- (CO2) (e) Give two application of Queue. (1.5)
- (CO3) (f) How can we calculate node's in degree and out degree using adjacency matrix. (1.5)

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- (CO3) (g) How can we find immediate successor of a node in Binary search tree. (1.5)
- (CO4) (h) How sequential files are different from direct file organization. (1.5)
- (CO4) (i) Differentiate between binary and linear search. (1.5)
- (CO2) (j) What are the conditions for queue to be full in array form? (1.5)

### **PART-B**

2. (CO1) (a) Explain how an array is defined dynamically. Using this, find the product of two  $n \times n$  matrices. Also Explain its time complexity. (7.5)
- (CO1) (b) Write a program to copy the contents of one file to other. (7.5)
3. (CO2) (a) Explain various asymptotic notations to calculate the time complexities of algorithm. (7.5)
- (CO2) (b) Explain how an element is inserted in a stack using linked list form. (7.5)
4. (CO3) What is a Binary tree? How it is stored in memory. Explain with the help of an algorithm how a given element is deleted in a binary search tree? (15)

5. (CO2) (a) Explain how an element is deleted in a Queue using Array form. (7.5)
- (CO4) (b) What is Hashing. List some of the popular hash functions. Also, explain what the problem of hashing is and how it can be rectified. (7.5)
6. (CO3) (a) Write the algorithm of insertion in a graph using linked list representation. (7.5)
- (CO4) (b) Differentiate between various file organizations in detail. (7.5)
7. Write Short notes on the following :
- (CO3) (a) AVL trees.
- (CO1) (b) Algorithm or C code for Heap sort. (15)
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