Roll No. .... Total Pages : 3

207603

May, 2019

B. Tech. (Electrical Engg.) - 6th Semester, May 2019
DATA STRUCTURES(CS-306)

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) Which asymptotic notation gives upper bound time complexity of algorithms.   (1.5)

    (CO2) (b) Differentiate between linear and non linear data type.   (1.5)

    (CO1) (c) Differentiate between grounded and headed linked list.   (1.5)

    (CO3) (d) Give two applications of stack.   (1.5)

    (CO4) (e) Give the advantages of binary search over linear search.   (1.5)

    (CO4) (f) How can we calculate node in degree and out degree using adjancy matrix.   (1.5)

(CO4) (g) How can we find immediate successor of a node in Binary search tree.   (1.5)

(CO2) (h) Which data type (float or integer) will be good for calculating factorial of a number and why?   (1.5)

(CO5) (i) Which sorting algorithm has lowest time complexity?   (1.5)

(CO6) (j) What is the time complexity values for hashing, linear and binary search.   (1.5)

PART–B

2. (CO2) (a) Explain various asymptotic notation to calculate the time complexities of algorithm.   (7.5)

   (CO3) (b) Explain how we can delete an element from a Queue using array form. Also, explain its time complexity.   (7.5)

3. (CO2) (a) Explain how an element can be inserted in a stack using link list representation. Also, explain its time complexity.   (7.5)

   (CO4) (b) Write an algorithm to calculate the reachability matrix using adjancy matrix form of a graph.   (7.5)

4. (CO4) Write the algorithm of deletion of a node with a given info value from a Binary Search tree. Also explain, its time complexity.   (15)

5. (CO5) (a) Explain heap sort algorithm with the help of an example. Also, write its time complexity too. (7.5)

(CO6) (b) Explain popular hash functions in details. Also, tell what are the problems faced in hashing and how the problems can be rectified. (7.5)

6. (CO4) (a) Write Prim's Algorithm for finding Minimum Spanning Tree. (7.5)

(CO4) (b) Write the algorithm for Bellman ford algorithm. Also, explain its time complexity. (7.5)

7. Write Short notes on the following :

(CO2) (a) Advantage of using correct data type.

(CO1) (b) Write the algorithm of trace of a matrix but the time complexity should not exceed theta(n).

(CO5) (c) Radix sort. (5+5+5)

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