008605

May 2023
B.Tech (ECE) VI SEMESTER
Data Structure (OEL-602)

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.*

PART–A

1. (a) Consider two dimensional array named Marks [10][5] having base address 2000 and number of bytes per element of array is 4. Now compute address of element Marks[3] [4].   [CO1] [10] (1.5)

    (b) Compute time complexity of binary search.
                                                   [CO2] [10] (1.5)

    (c) Convert the following infix expression to postfix expression

        (i) $((A - B) + D/((E + F) * G))$

        (ii) $14/7 * 3 - 4 + 9/2$ [CO1] [10] (1.5)

    (d) Write the code in c to compute number of elements in a Queue.   [CO2] [10] (1.5)

    (e) Calculate minimum number of levels required in binary tree to store 75 elements.   [CO3] [10] (1.5)

(f) In a Graph having Adjacency Matrix, as given below. Find the outdegree of all the nodes. [CO3] [LO] (1.5)

$$\begin{pmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{pmatrix}$$

(g) Sort the following series [42, 34, 75, 23, 21, 18, 90, 67, 78} using insertion sort. Draw all the steps. [CO2] [10] (1.5)

(h) What is meaning and utility of term EOF. [CO4] [LO] (1.5)

(i) Explain the criteria that you will keep in mind while choosing an algorithm to solve a particular problem. [CO1] [LO] (1.5)

(j) What is the condition for empty header link list. [CO2] [LO] (1.5)

PART–B

2. (a) Write a program in c to remove duplicate values from an array. [CO1] [10] (7.5)

(b) Implement bubble sort using C. Also compute its time complexity. [CO1] [10] (7.5)

3. (a) Write a program in c implement operation of stack using array. [CO2] [10] (7.5)

(b) Write a program in c implement operation of DEQUE using array. [CO2] [10] (7.5)

4. (a) Write program in c to compute area of triangle using function and pointers. [CO1] [10] (7.5)

(b) Write a program in c implement operation of linked queue [CO2] [10] (7.5)

5. (a) Write a program in c to insert a node in BST using linked representation [CO] [HO2] (7.5)

(b) Write code in c to delete an element from a graph using array form. [CO3] [LO] (7.5)

6. (a) Write an algorithm to delete a node X which is left child of Y & X is having only left subtree in a threaded binary tree. Draw appropriate diagrams. [CO2] [10] (7.5)

(b) Explain the DFS operation for a graph of your choice. [CO3] [10] (7.5)

7. (a) Write code in c to display content of text file on monitor screen. [CO4] [LO] (7.5)

(b) Explain skip list using appropriate diagrams. [CO2] [LO] (7.5)

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