R17

Code No: 842AA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MCA II Semester Examinations, October/ November - 2020
DATA STRUCTURES AND ALGORITHMS

Time: 2 Hours **Max.Marks:75**

Answer any five questions
All questions carry equal marks

1.a) Write an algorithm to implement Merge sort applying Divide and Conquer method.
b) Apply Merge Sort to sort the following elements in the ascending order.
20, 12, 14, 85, 94, 45, 74, 33, 25, 67. [7+8]

2. Write an algorithm for Prim's algorithm to find minimum cost spanning tree. [15]

3.a) Write the General method for Backtracking design method.
b) Write an algorithm to N-Queens problem and explain with an example of considering 4*4 chess board. [7+8]

4.a) Write an algorithm for Insertion sort technique and apply it for arranging the following elements in ascending order
25, 77, 88, 54, 96, 32, 14, 59, 64.
b) Write algorithms to implement Skip lists operations: insertion and deletion. [7+8]

5.a) Define a Binary Tree and write the applications of binary trees.
b) Write an algorithm for Depth First Search (DFS) traversal of a graph and give an example. [7+8]

6.a) Explain Strassen's matrix multiplication.
b) Write an algorithm for Binary search. Give its time complexity analysis. [7+8]

7. Let n=5, $(p_1 \ldots p_5) = (20, 15, 10, 5, 1)$ and $(d_1 \ldots d_5) = (2, 2, 1, 3, 3)$. Find out an optimal solution for given job sequence with deadlines problem using Greedy method. [15]

8.a) Write the General method for Dynamic programming.
b) Let n=4 and $\{a_1, a_2, a_3, a_4\}$ = {do, if, int, while}. Let p[1…4]={3, 3, 1, 1} and q[0..4]={2,3,1,1,1} construct the optimal binary search tree. [7+8]

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