R17

Code No: 842AA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MCA II Semester Examinations, July/August - 2021
DATA STRUCTURES AND ALGORITHMS

Time: 3 Hours **Max.Marks:75**

Answer any five questions
All questions carry equal marks
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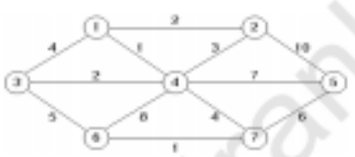
1.a) Rearrange following numbers using Quick sort: 10, 6, 3, 7, 17, 26, 56, 32, 72.
b) Give the properties asymptotic notations. [7+8]

2. Trace the Merge sort algorithm to sort the list A, V, I, S, H, K, R, U, T, H in alphabetical order. [15]

3. What is the solution generated by function Job Sequencing algorithm when n = 6 $(P_1,P_2,P_3,P_4,P_5,P_6)$ = (3, 5, 20, 18, 1, 6) and $(D_1,D_2,D_3,D_4,D_5,D_6)$ = (1, 3, 4, 3, 2, 1). [15]

4. What is a Spanning tree? Explain Prim's and Krushkal's algorithm with the following graph. [15]



5. Draw an Optimal Binary Search Tree for n = 4 identifiers
(a1,a2,a3,a4) = (do, if, read, while) P(1:4) = (3,3,1,1) and Q(0:4) = (2,3,1,1,1). [15]

6. Discuss the 4 – Queen's problem. Draw the portion of the state space tree for n = 4 Queens using backtracking algorithm. [15]

7. Define Max Heap. Construct Max Heap for the following:
140, 80 , 30 , 20 ,10 ,40 ,30 ,60 ,100 ,70 ,160 ,50 , 130, 110, 120. [15]

8.a) Show that the maximum number of nodes in a Binary tree of height 'h' is 2^{h+1}-1.
b) Explain in detail about creation of a Binary Search Tree with suitable example. [7+8]

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