PA-4976

[6008] - 228

S.E. (Computer /A.I. & D.S.) (Insem)
DATA STRUCTURES AND ALGORITHMS
(2019 Pattern) (Semester - II) (210252)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) Solve Q.1 or Q.2, Q.3 or Q.4.

2) Figures to the right side indicate full marks.

4) Assume suitable data, if necessary.

Q1) a) We have a hash table of size 10 to store integer keys, with hash function $h(x) = x \bmod 10$. Construct a hash table step by step using linear probing without replacement strategy and insert elements in the order 31,3,4,21,61,6,71,8,9,25. Calculate average number of comparisons required to search given data from hash table using linear probing without replacement. **[6]**

b) Explain the concept of quadratic probing using example. What are the advantages and disadvantages of quadratic probing over linear probing? **[5]**

c) What is hashing? Explain the properties of good hash function with examples. **[4]**

OR

Q2) a) Insert the following data in the hash table of size 10 using linear probing with chaining by applying with replacement : 11, 33, 20, 88, 79, 98, 68, 44, 66, 24. Calculate average number of comparisons required to search given data from hash table. **[6]**

b) Add following keys in hash table by applying extendible hashing mechanism. Assume capacity of each directory to store buckets is 3. Keys are 10, 20, 15, 12, 25, 30, 7, 11, 08. **[5]**

c) Write short note on skip list. **[4]**

P.T.O.

Q3) a) Write an algorithm to delete a node from Threaded binary Search Tree.
[6]

b) The following numbers are inserted into an empty binary search tree in the given order : G, C, B, A, D, E, F, I, H. Construct tree step by step. Represent the constructed tree using static memory allocation. **[5]**

c) Let characters a, b, c, d, e, f has probabilities 0.07, 0.09, 0.12, 0.22, 0.23, 0.27 respectively. Find an optimal Huffman code and draw Huffman tree. **[4]**

OR

Q4) a) Construct threaded binary tree step by step if the preorder traversal is G, B, D, C, A, K, Q, P, R & in-order traversal is B, A, C, D, G, K, P, Q, R. Delete G and redraw a tree. **[6]**

b) Write a non-recursive function to display data in Binary Search Tree in descending order. **[5]**

c) Explain how to convert general tree to binary tree with example. **[4]**

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