

CS213/293 Data Structure and Algorithms 2023

IITB India

Quiz 2

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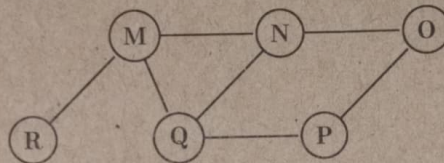
Compile date: 2023-10-17

Duration : 45 minutes

Total: 30 marks

1. (6 marks) Mark the following statements True / False. Also provide justification.

(a) MNRQPO is correct BFS traversal for the following graph.



(b) Heapsort sort in the worst case is $O(n^2)$.

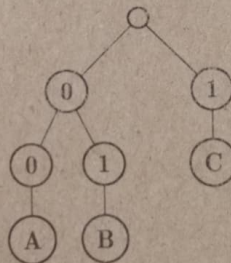
(c) Variable Q in our BFS always contains nodes from same level.

(d) A tree with 10 nodes has 10 edges.

(e) For a graph G , $SCC(G)$ is acyclic.

(f) In Huffman encoding, the code length does not depend on the frequency of occurrence of characters.

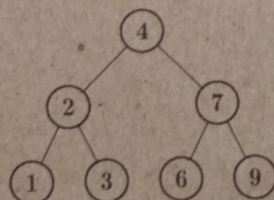
2. (4 marks) Given the following Huffman tree decode string "1001011"



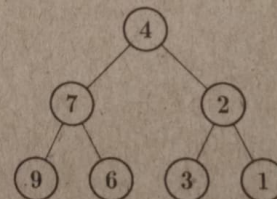
3. (6 marks) Given the root of a binary tree, invert the tree, and return its root.

Example:

Input




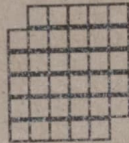
Output



4. (6 marks) Compute the running time of breadth-first search on a tree with n edges in the cases when the tree is represented by

- An adjacency list
- An adjacency matrix

5. (8 marks) Prove that it is not possible to tile the following floor using some number of tile . Tiles must not be deformed and overlap.



(Hint: Use counting argument!)