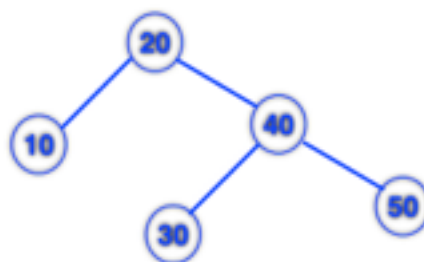**Answer the following - 2 marks each**
1. Enqueuing adds an element to the …………… of the queue. The ………. pointer needs to be updated.
2. Queues, Stacks, and Trees are examples of …………………… data structures
3. A binary tree with n nodes has a minimum height of ……….
4. A binary tree in which all interior nodes have two children and all leaves have the same depth is called a……………..
5. A sequence of nodes and edges connecting a node with a descendant is called ……………..
6. A sorted Tree with a maximum of two children is called a …………………..
7. The root node in a Red-Black tree is always coloured …………….
8. In Splay Trees, splaying is the process of ………………………….
9. Searching for a node along its path is called ……………………
10. Difference of height between left and right sub-trees of a node is termed its …………

Answer the following - 20 marks each

1. Define the following data structures in C and illustrate each using diagrams. In each case label relevant nodes using standard convention. **5 marks each**
    a. Doubly linked list with integer data 10 - 50 in each node
    b. Stack with the following values 2, 7, 8, 3, 0, 9
    c. Circular queue with the following values 4, 2, 0, 5, 8, 1, 9, 3, 7, 6
    d. A binary tree initialised to 1,2,3,4,5,6,7,8,9.

2. Do the following: **5 marks each**
    a. Write pseudocode for the following algorithms.
        I.   Depth-First-Search
        II. Breath-First-Search
        III. Inserting a node into an AVL Tree in the RR case
    b. List the properties of Red-Black trees

3. Given the following AVL Trees, insert the following values. For each insert, show the required rotations step-wise and label the nodes with their balance factors. Display the resulting tree. **10 marks each**

    a. Insert 60 into the tree

b. Insert 8 into the tree
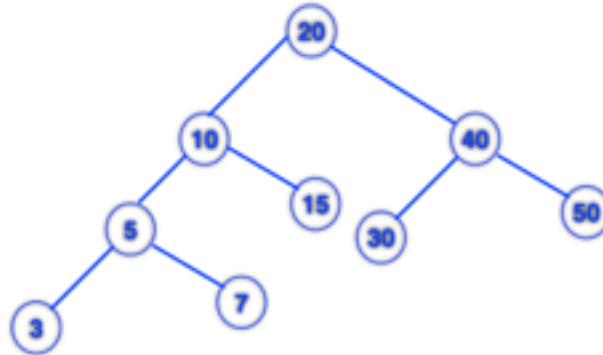
4. Do the following. **10 marks each**
   a. Write the pseudocode for the Infix to postfix conversion algorithm
   b. Convert x-y*(5+3^6*8)^2+(x*z)-10 to postfix. Show the output string and stack values at each step.