

SOLUTION

ICS-202 Data Structures, Quiz 03, Section \_\_\_\_\_ [V3], First Semester 2021-22

Name: \_\_\_\_\_, ID: \_\_\_\_\_

Q. 1 [7 marks] Insert the following integers in an initially empty AVL tree in this order: 10, ~~0~~, 8, 5, 6

Balance the tree after each insertion. Show all rotation(s) done.

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<p>Step 1 [if needed]</p> <p style="text-align: center;">10</p>	<p>Step 2 [if needed]</p> <pre>       10      /     3         </pre>	<p>Step 3 [if needed]</p> <pre>       10      /     3    / \   4   8         </pre> <p>Double Left Right Rot.</p>	<p>Step 4 [if needed]</p> <pre>       10      / \     8   3    / \   3   5         </pre>
<p>Step 5 [if needed]</p> <pre>       8      / \     3  10         </pre>	<p>Step 6 [if needed]</p> <pre>       8      / \     3  10      \      5         </pre>	<p>Step 7 [if needed]</p> <pre>       8      / \     3  10      \      5     / \    4   6         </pre> <p>Single Left Rotation,</p>	<p>Step 8 [if needed]</p> <pre>       8      / \     5  10    / \   3   6         </pre> <p><u>ANS.</u></p>

Q. 2 [3 marks] Given the following (unbalanced) AVL tree, balance the tree after deleting 'R'. Show the rotation(s).

<p>Initially,</p> <pre>       K      / \     D  P      \  / \      M /  R      \ /      N         </pre>	<p>Step 1 [if needed]</p> <p>After deleting 'R'</p> <pre>       K      / \     D  P      \      M      \      N         </pre>	<p>Step 2 [if needed]</p> <pre>       K      / \     D  P      \  / \      M /  N      \ /      N         </pre>	<p>Step 3 [if needed]</p> <pre>       K      / \     D  N      \  / \      M /  P         </pre>
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Double Left  
Right Rot.