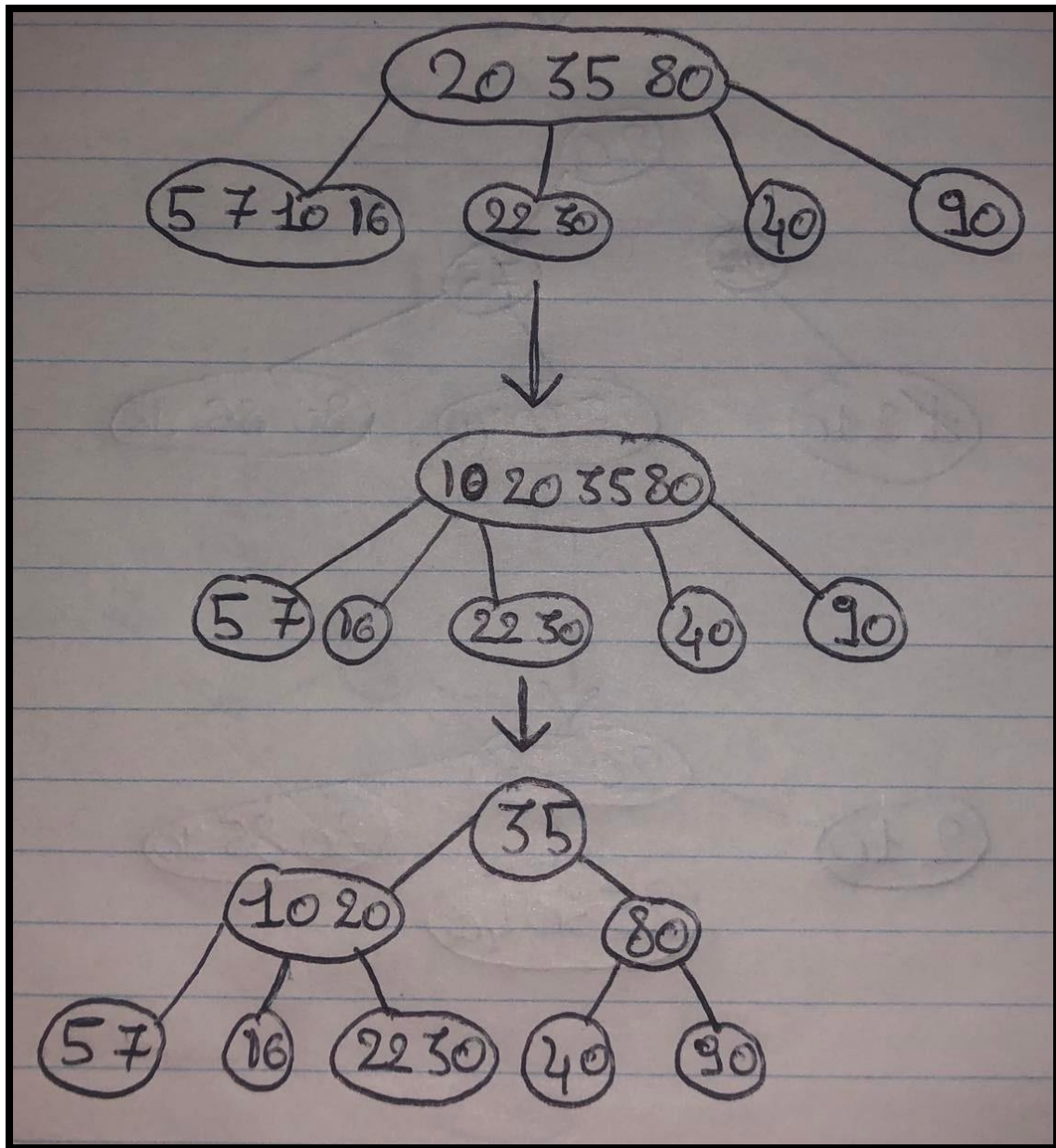


**Question 1 :**

a. The height of the 2-4 tree can be increased by inserting a key in the leftmost node to cause an overflow, which will result in the creation of a new root (and thus, increase the tree height by one)

As an example :



-We insert the key 16 in the leftmost node

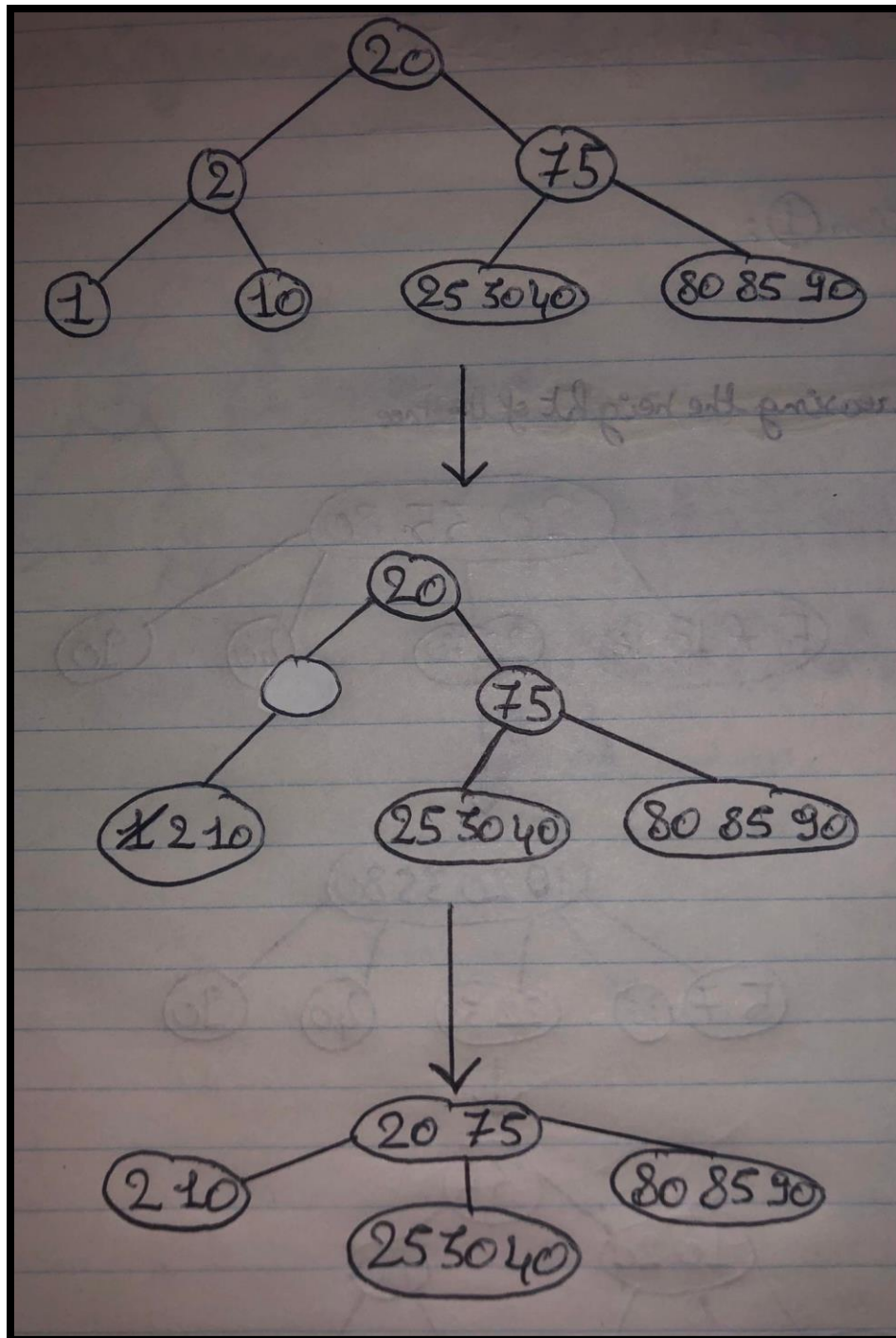
-We transfer (either 7 or 10) to the root, in this case we'll be sending 10

-We can then pick a new root (it can either be 35 or 20), we'll be sending 35

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b. The height of the 2-4 tree can be decreased by removing a key in the leftmost node to cause an underflow :



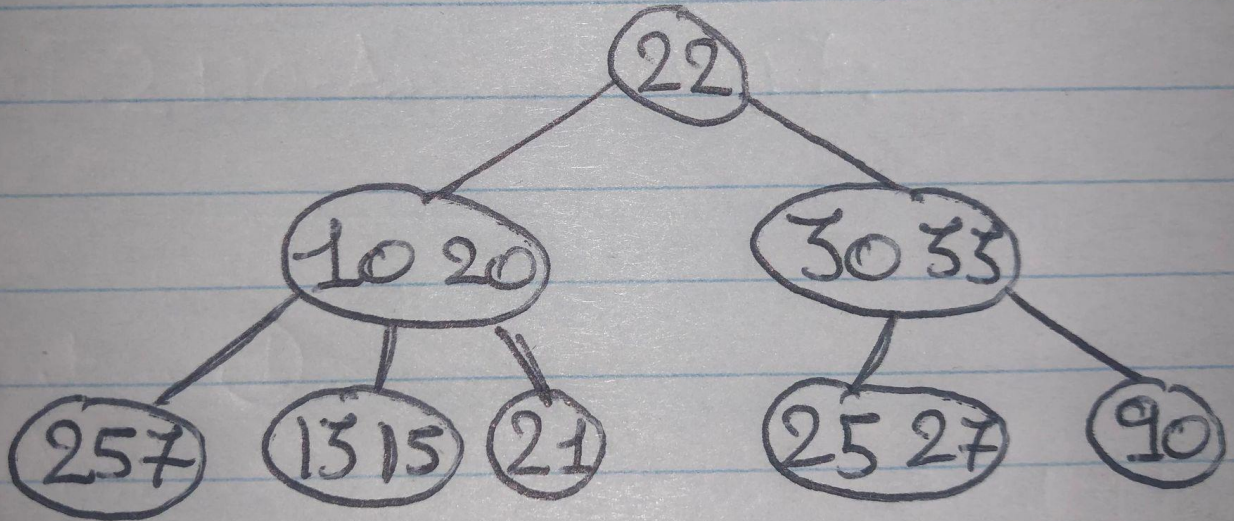
- We combine 2 with the leftmost deepest node (leaving 2's node empty)
- We can remove a key (either 1 or 10), in this case we'll remove 1
- We combine the root and 75 to get rid of the node that's null

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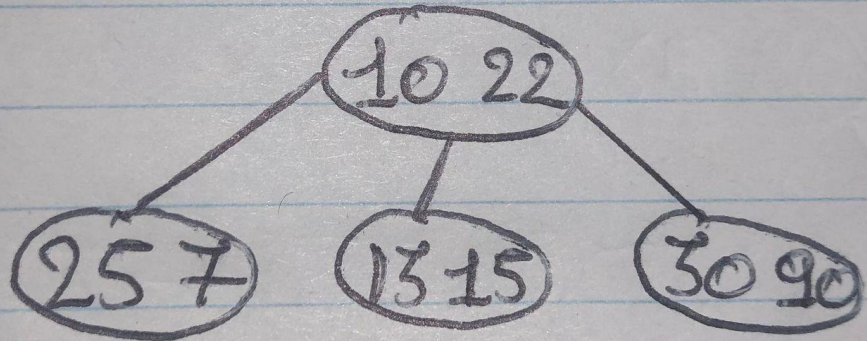
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Question 2 :

a.



b.





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Question 3 :

