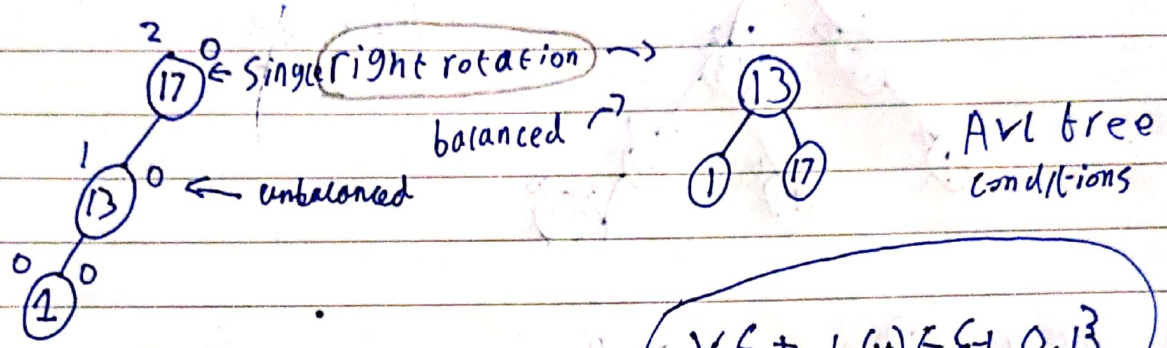
Practical task 7.1 - AVL Trees

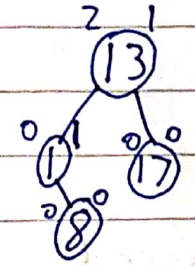
1) 17, 13, 1, 8, 5, 11, 24, 27, 15, 6, 16

a)

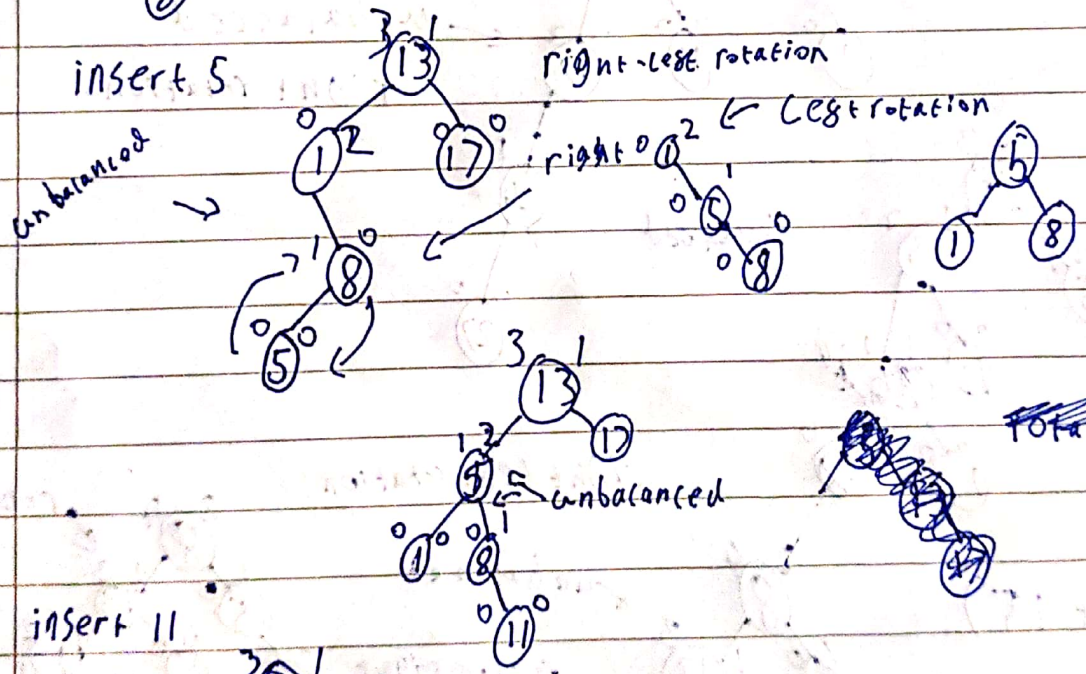


$\forall v \in T, b(v) \in \{-1, 0, 1\}$

b)

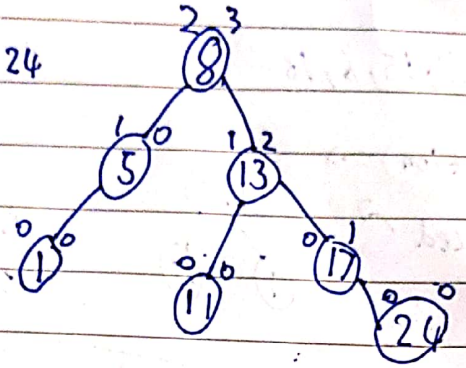


c)



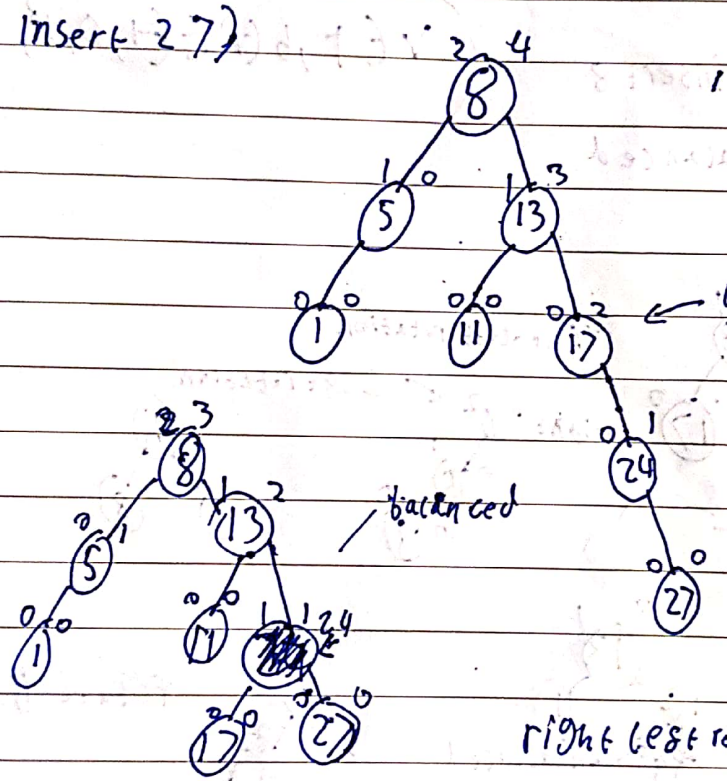
d)

e) Insert 24



Balanced

f) Insert 27)

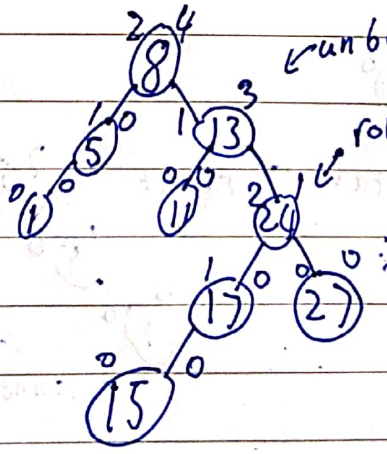


unbalanced

right rotation

balanced

g) Insert 15).

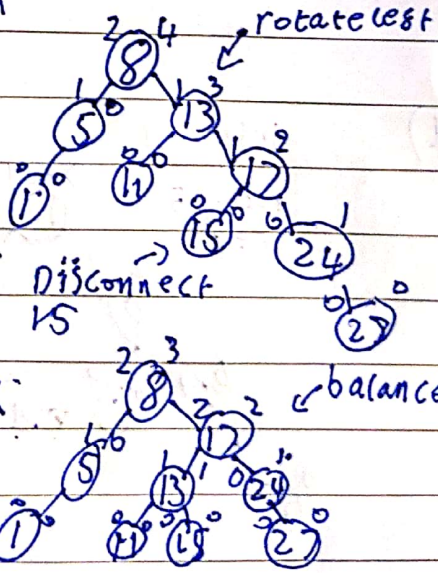


unbalanced

rotate right

right left rotation

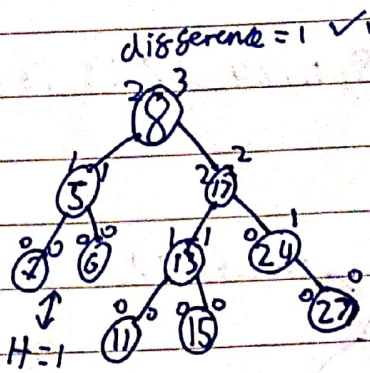
13 rotate left



Disconnect 15

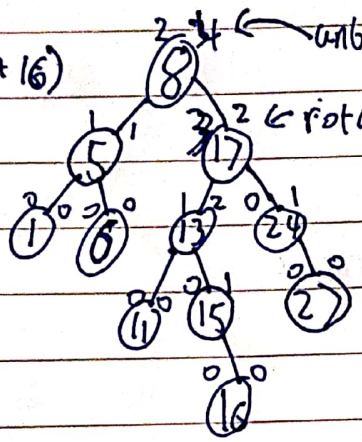
balanced

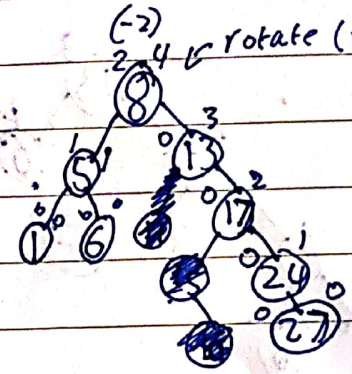
H) insert(6)



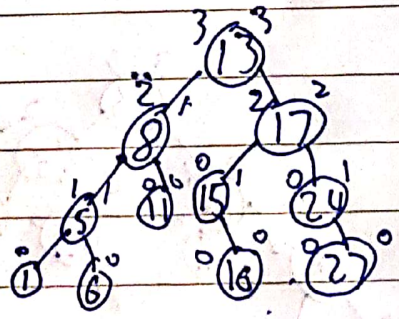
Balanced

I) insert(16)





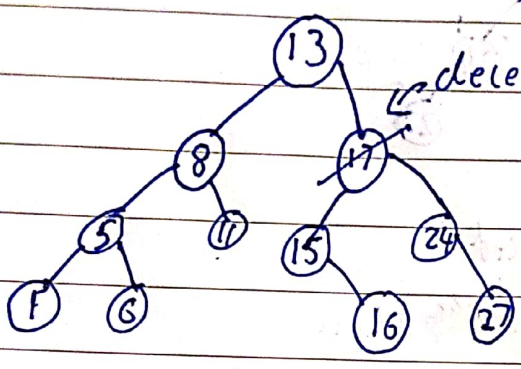
11, 15, 16 gets disconnected and reattached

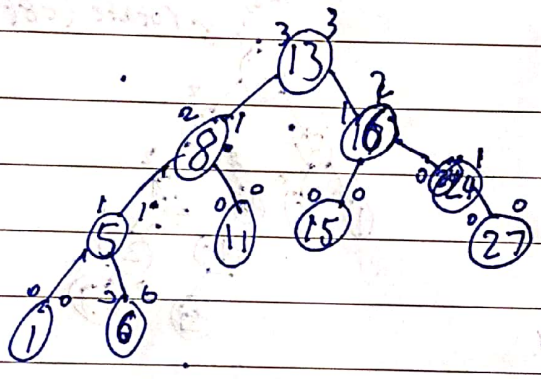


Balanced

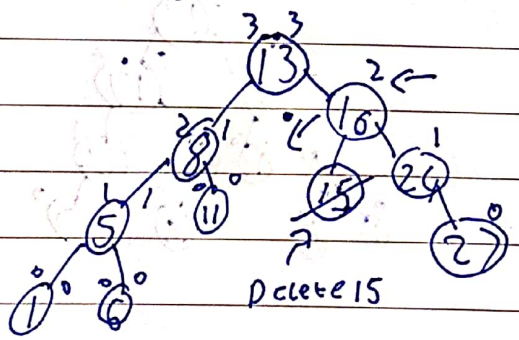
2) Delete 17, 15, 11, 24, 27, 13, 16, 5, 6, 1, 8

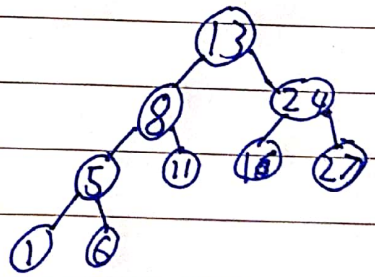
delete 17)



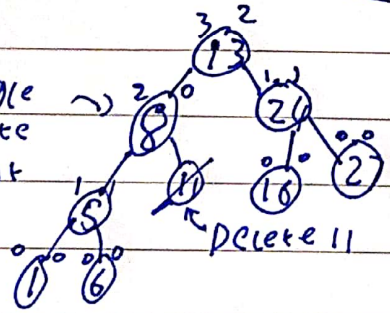


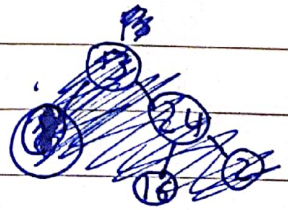
Delete 15)

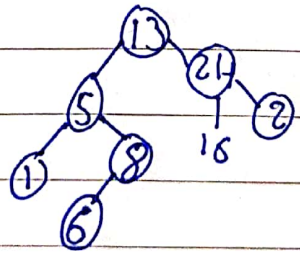




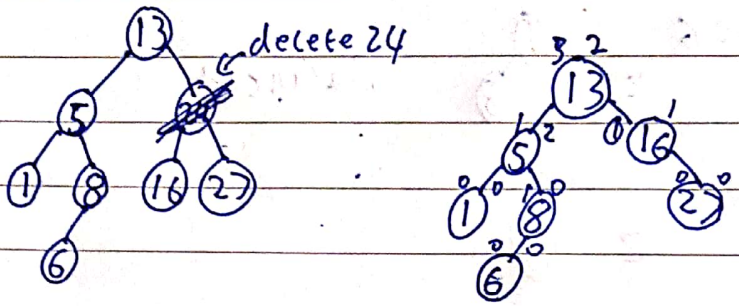
Delete 11) Single rotate right



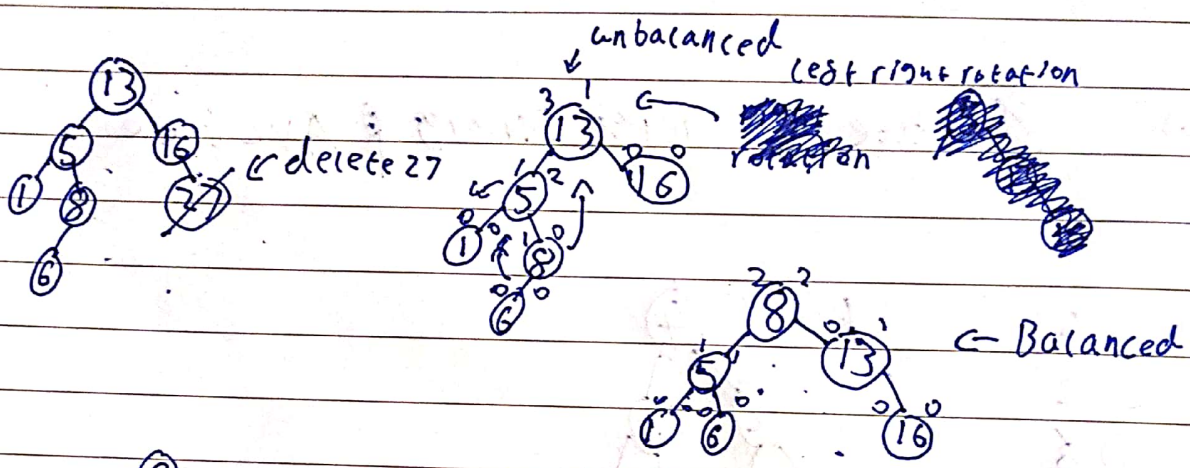




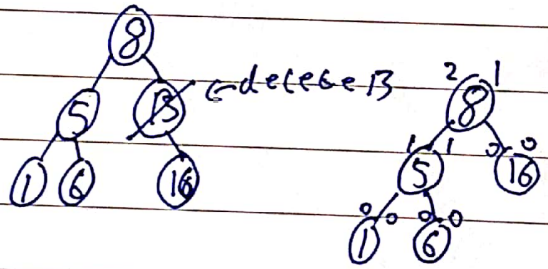
Delete 24)



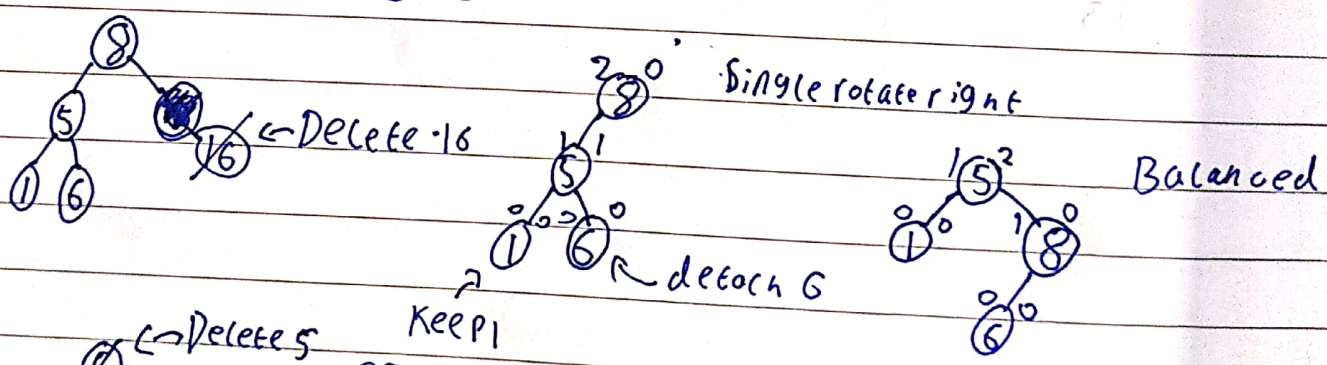
Delete 27)



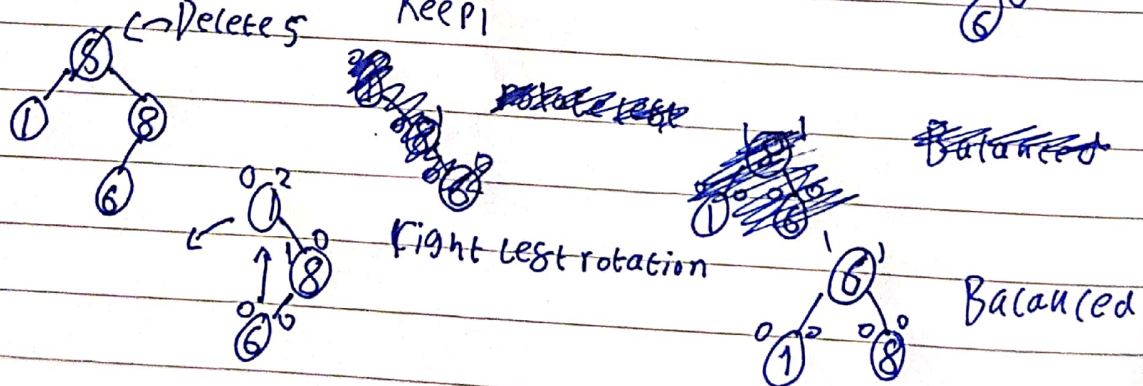
Delete 13)



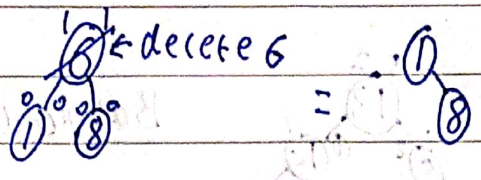
Delete 16)



Delete 5)

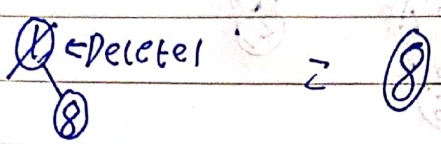


Delete6)



Balanced

Delete1)



Delete8) 8 Delete -> empty Binary & AVL tree

3) 1) 4
2) 2
3) 6
4) 1
5) 7
6) 5
7) 3