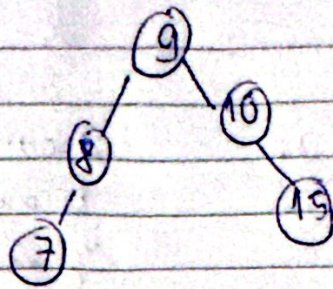
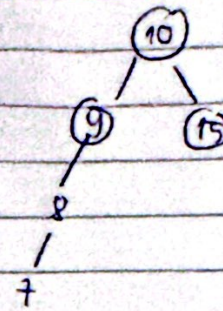


i)

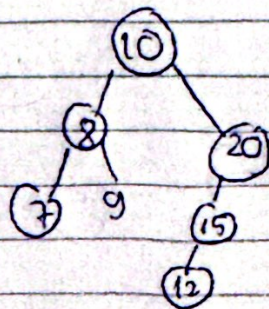


Write balance factor →

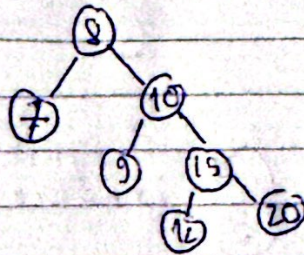


$$\begin{aligned}
 10 &= 0 - 2 = -2 \\
 15 &= -1 - (-1) = 0 \\
 9 &= -1 - 1 = -2 \\
 8 &= -1 - 0 = -1 \\
 7 &= -1 - (-1) = 0
 \end{aligned}$$

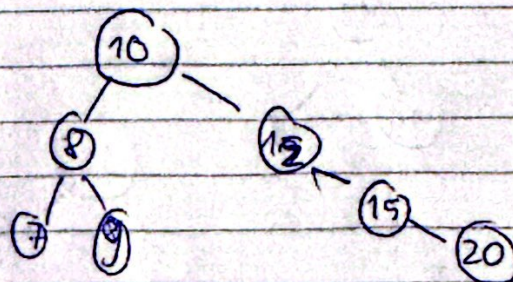
ii)



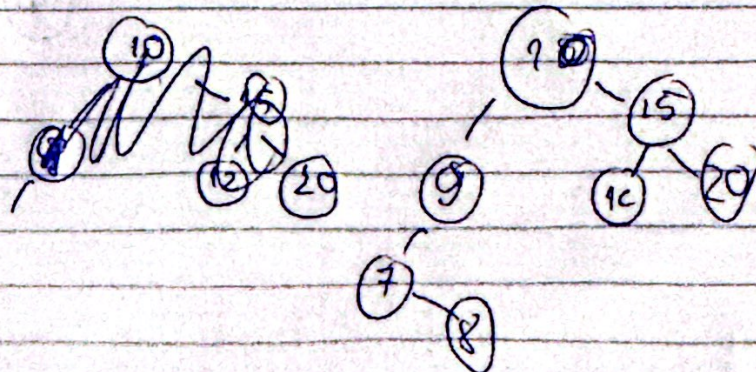
iii)



2) a)

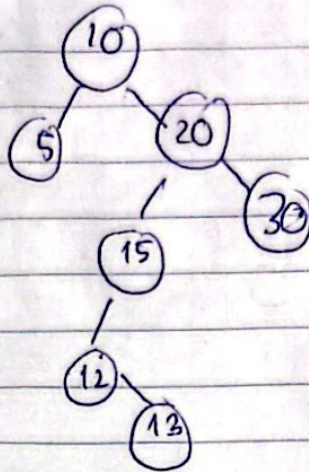


b)





(c)

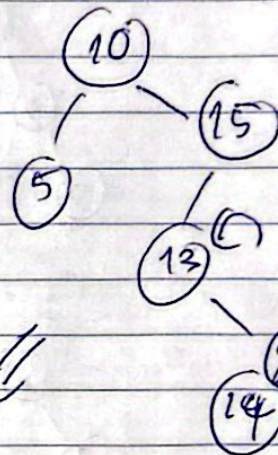
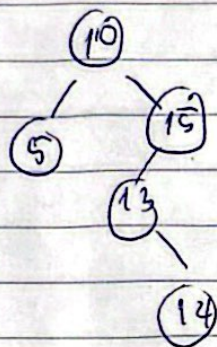


Balance Factor

$$15 = -1 - 1 = -2$$

⇒ So it is LL imbalance  
because the balance factor  
of 15 is -2

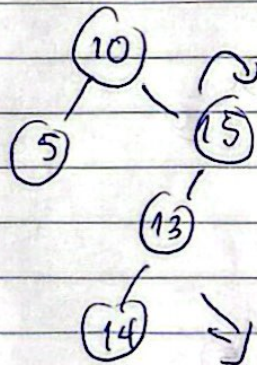
(d)



left rotate

(13)

since it is LR



right  
now rotate: 15, 14

