: Muhammad
fahad
: Fa19-BSSE-0014
Date: : Am
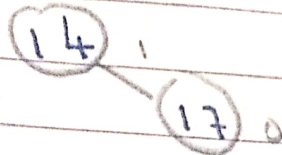
Quiz

Insertion :

14 ,17,11, 7, 5 3, 4,13,12 , 8, 60,19,16, 20

Step #1 :-
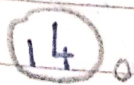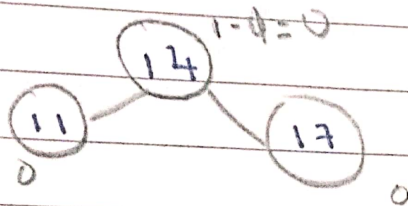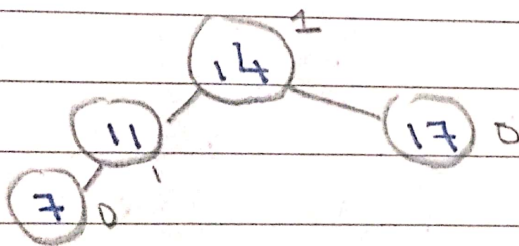
(14) 0

step #2 :-

(14) 1
  (17) 0

Step #3 :-

1-4=0
(14)
(11)   (17)
0   0

Step # 4 (insert 7)

1
(14)
(11)   (17) 0
 1
(7) 0

Step # 5 :-
(insert 53)

2-2=0
(14)
(11) 1   (17) 1
(7)   (53) 0
 0

Date: _____

Step #6:~
(insert 4)

14 3-2=1
11
7
4

17
53

⇒

14
7
4   11

17
53

Unbalance
(LL rotation)

balance

Step #7:~
(insert 13)

14 3-2=1
7
4   13
13

17
53

⇒

Step #8:~
(insert 12)

3-2=2
7
4   11
13
12

14
17
53

⇒

14
7
4   12
11   13

17
53
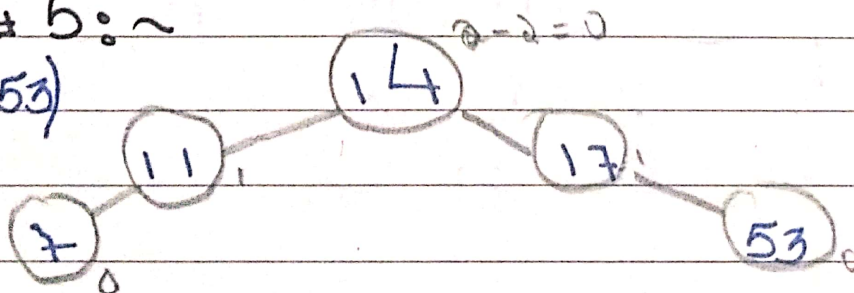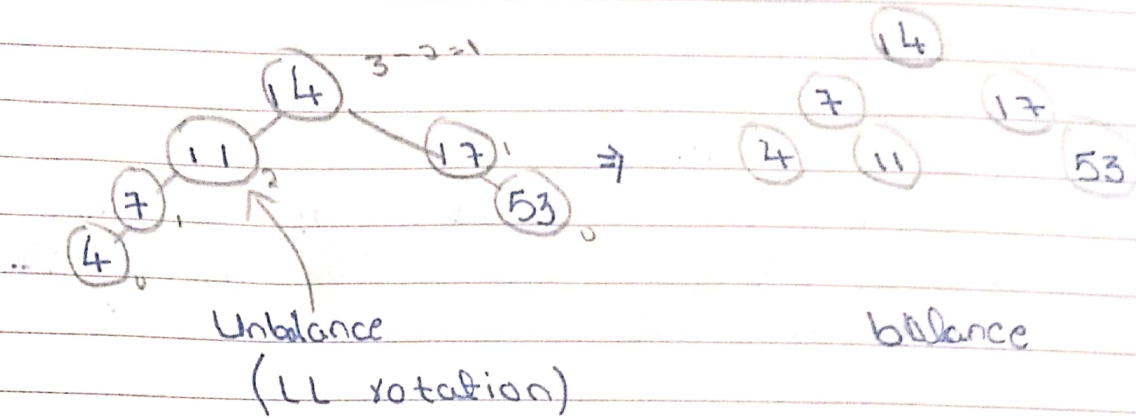
Unbalance
(R.R rotation)
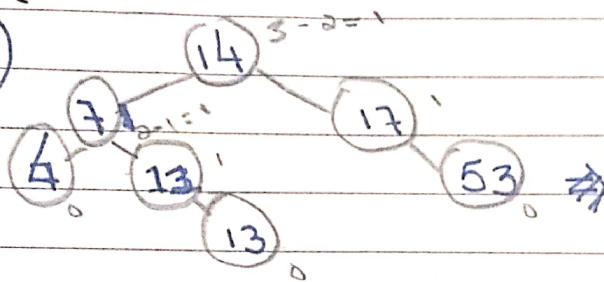
Step - 9 :-
(insert 8)
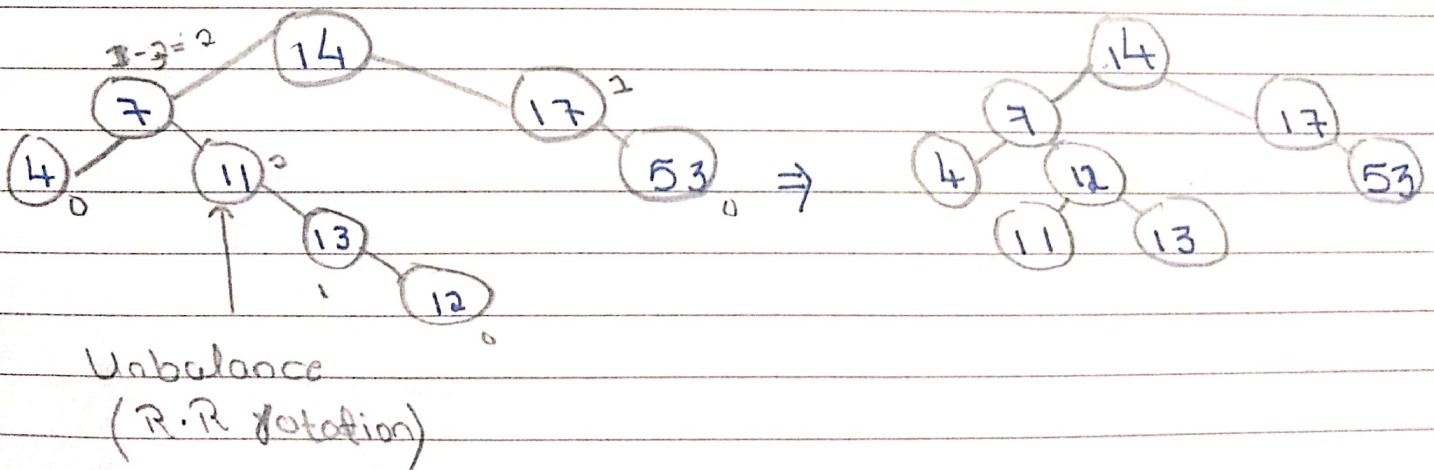
Unbalance
(7, 12, 11 R·L rotation)
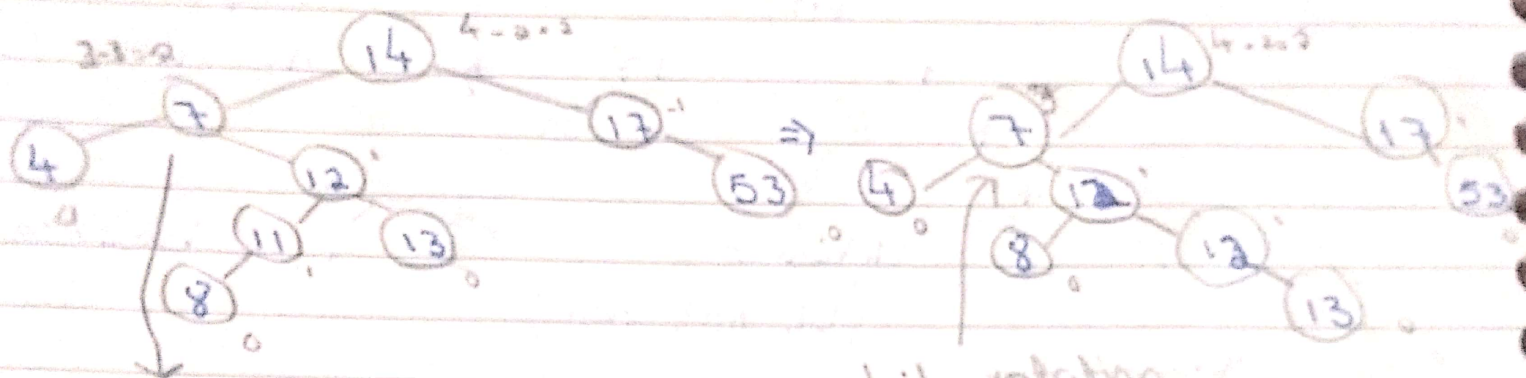
L·L rotation
(unbalance)

Step # 10
(insert 60)

2-3=

Tree diagram showing nodes: 14 (root), 11 (left child, marked 0), 17 (right child, circled), 7 (child, marked 1), 12 (child, marked 0), 4, 8, 13 (marked 0 each), 53, 60 (circled with 17)

→

Tree after balance: 14 (root), 11, 53, 7, 12, 17, 60, 4, 8, 13

Balance

Unbalance
(RR rotation)

Step # 11
(insert 19)

Tree diagram: 14 (root), 11 (left), 53 (right), 7, 12, 17, 60, 4, 8, 13, 19
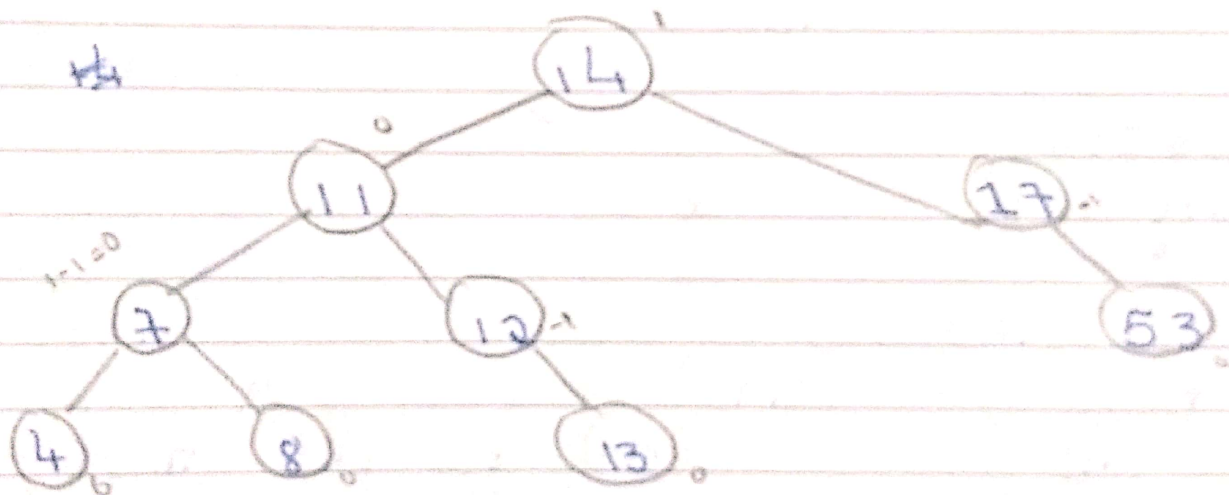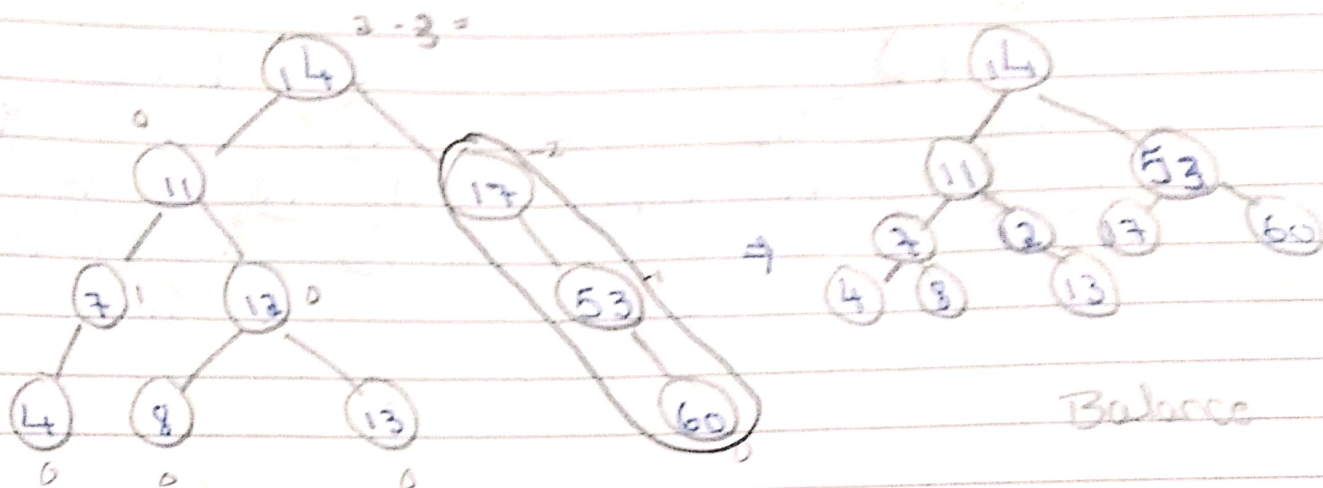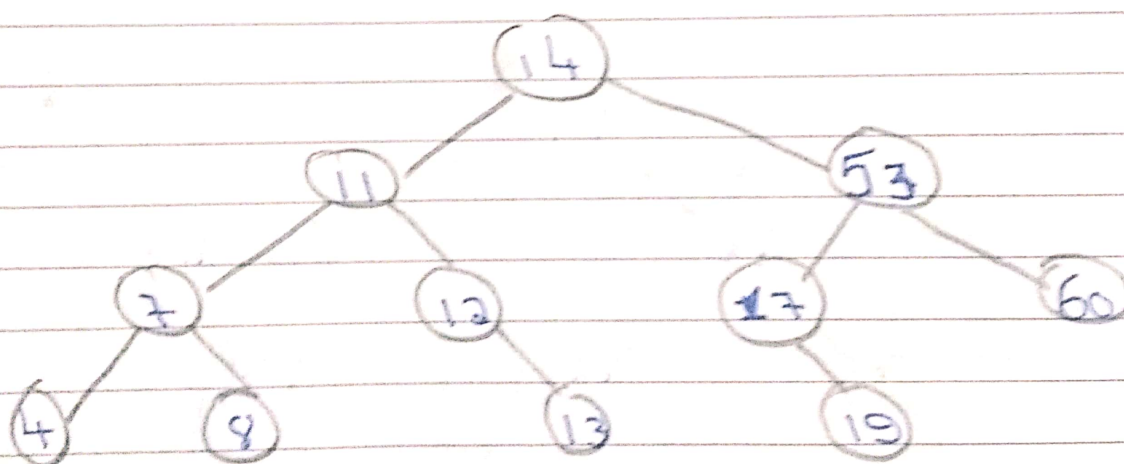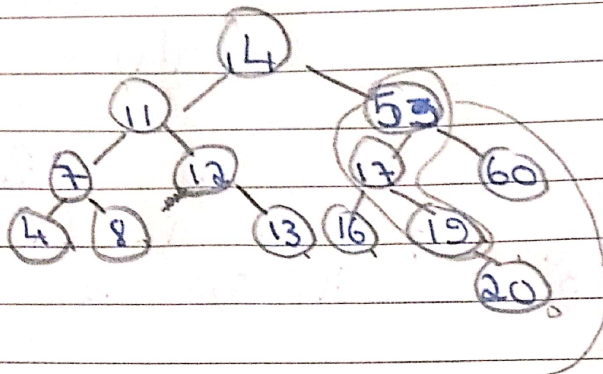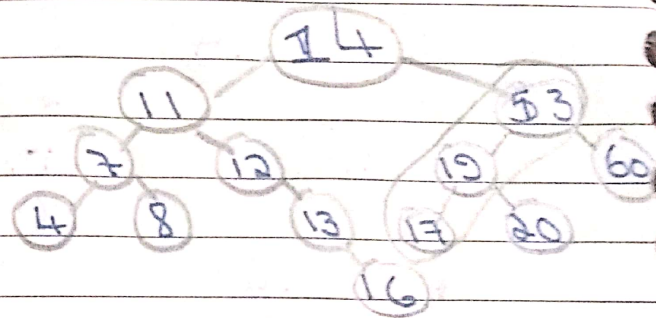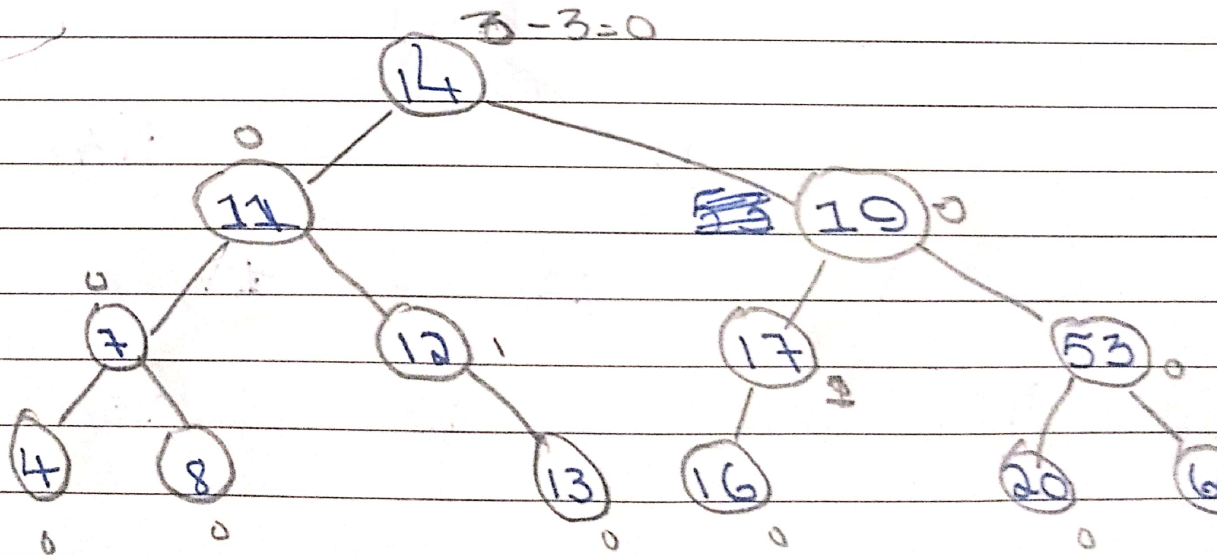
Step #12
(insert 20)

Unbalance

(R.L case)

(53, 17, 19)

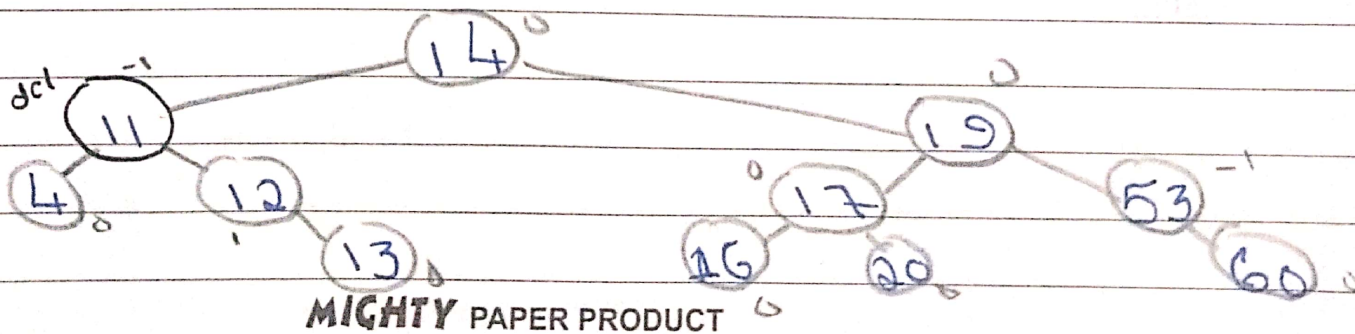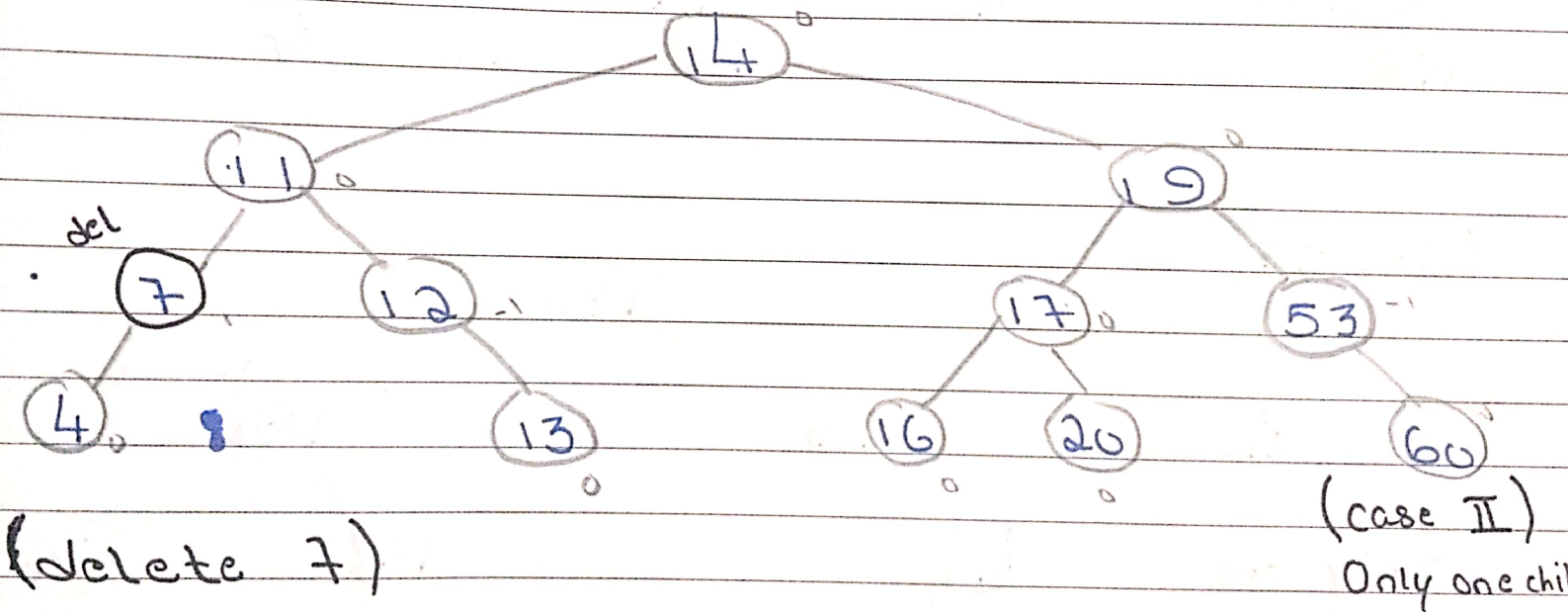Unbalance

(LL case)

(53, 19, 17)

Now final product will be

$3 - 3 = 0$

Delete:-

8, 7, 11, 14, 17

Step # 1
(delete 8)

(case I)
leaf root

(delete 7)

(case II)
Only one chil[d]

(delete 11)

(14)

(12)   (19)

(4)   (13)   (17)   (53)

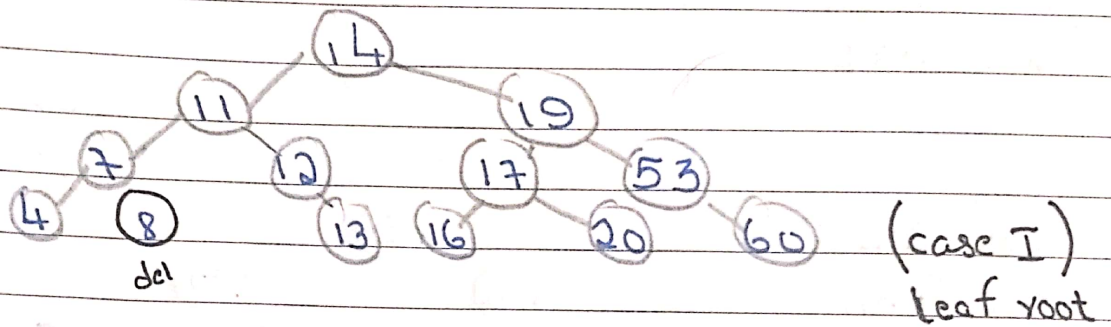(16)   (20) (80)
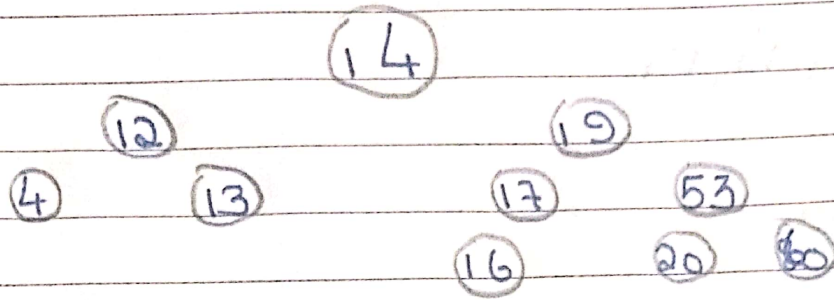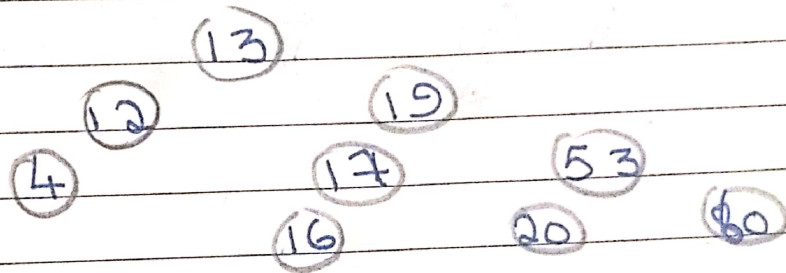
(del 14)   (Case III)
                                            two child
                                            min of right

Case III   (13)
max from   (12)   (19)
Left become (4)   (17)   (53)
right.   (16)   (20) (80)

(del 17)   2-3=1
                        (13)

Case II   (12)   (19)

                (4)   (16)   (53)

Only one   (80)
child

balance