NAME

SAIF-UR-REHMAN

SECTION

CY - A
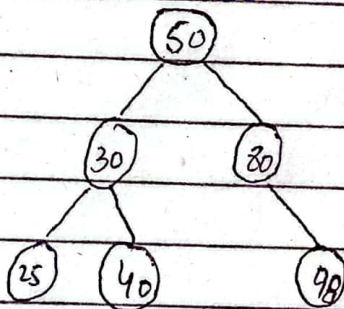
ROLL - No:

i22 - 1697
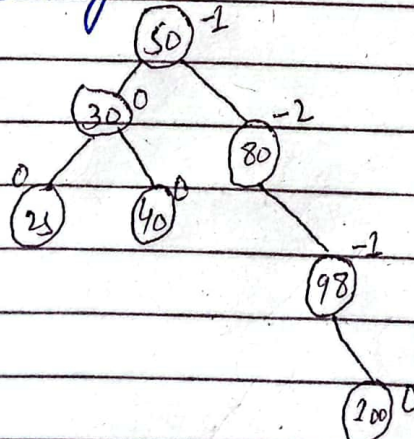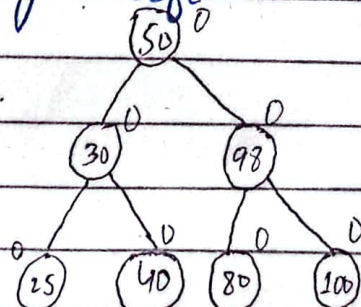
Q:3:

(a)

Given Tree:

Inserting 100:

Rotating Left to make it AVL:

∴ Balance factor at root node is 0-

(b) Inserting 24:

(24)

Inserting 39:

(24)
  \
   (39)

Inserting 31:

(24)   (24)   (31)
   \   \   /   \
    (39)   →   (31)   →   (24)   (39)
     /   \
    (31)   (39)

∵ Right left rotation.

Inserting 46:

        (31)
       /   \
     (24)   (39)
                \
                (46)

Inserting 48:

      (31)   (31)
     /   \   /   \
   (24)   (39)   →   (24)   (46)
             \   /   \
             (46)   (39)   (48)
                \
                (48)

∵ left rotation:

Inserting 34:

```
        (31)
       /    \
     (24)   (46)              →
           /    \
         (39)   (48)
         /
       (34)
```

```
        (31)                              (39)
       /    \                            /    \
     (24)   (39)          →            (31)   (46)
           /    \                     /   \      \
         (34)   (46)               (24)  (34)    (48)
                   \
                  (48)
```

∴ Right left rotation

Inserting 19:

```
        (39)
       /    \
     (31)   (46)
     /  \      \
   (24) (34)   (48)
   /
 (19)
```

Inserting 5:

```
        (39)                              (39)
       /    \                            /    \
     (31)   (46)          →            (31)   (46)
     /  \      \                       /  \      \
   (24)(34)   (48)                   (19)(34)   (48)
   /                                 /  \
 (19)                              (5)  (24)
 /
(5)
```

Inserting 29:


```
        (39)                          (39)
       /    \                        /    \
     (31)   (46)                   (31)   (46)
    /   \      \                  /   \    /  \
  (19) (34)   (48)              (24) (34)(48)
  /  \                         /   \
(5)  (24)                   (19)  (29)
        \                   /
       (29)              (5)
```

```
            (39)
           /    \
        (24)    (46)
       /   \      \
     (19) (31)   (48)
     /    /  \
   (5)  (29) (34)
```
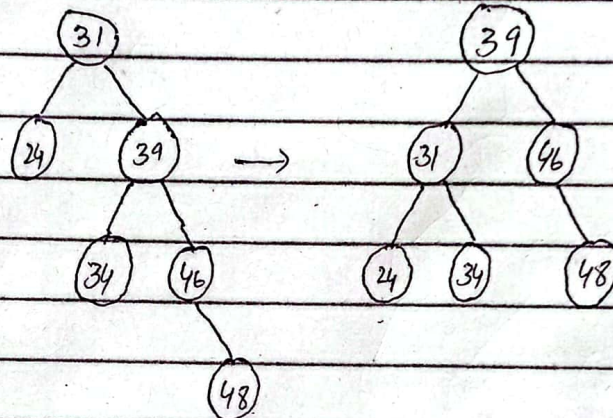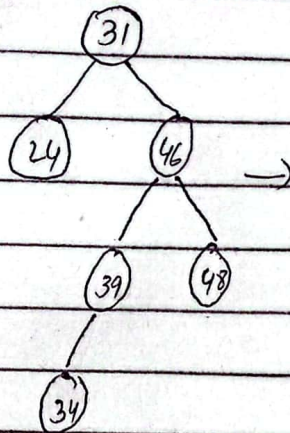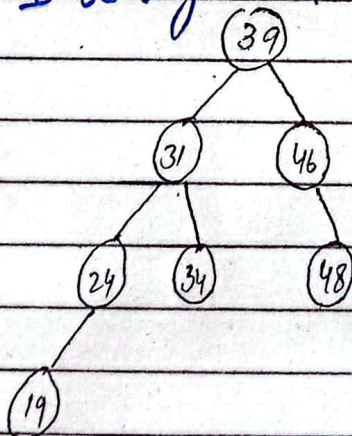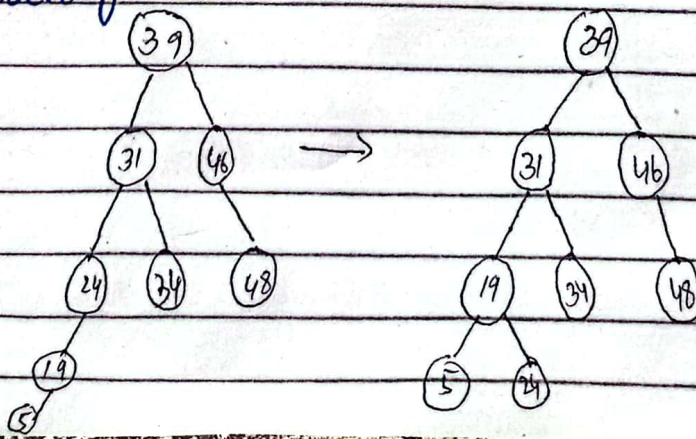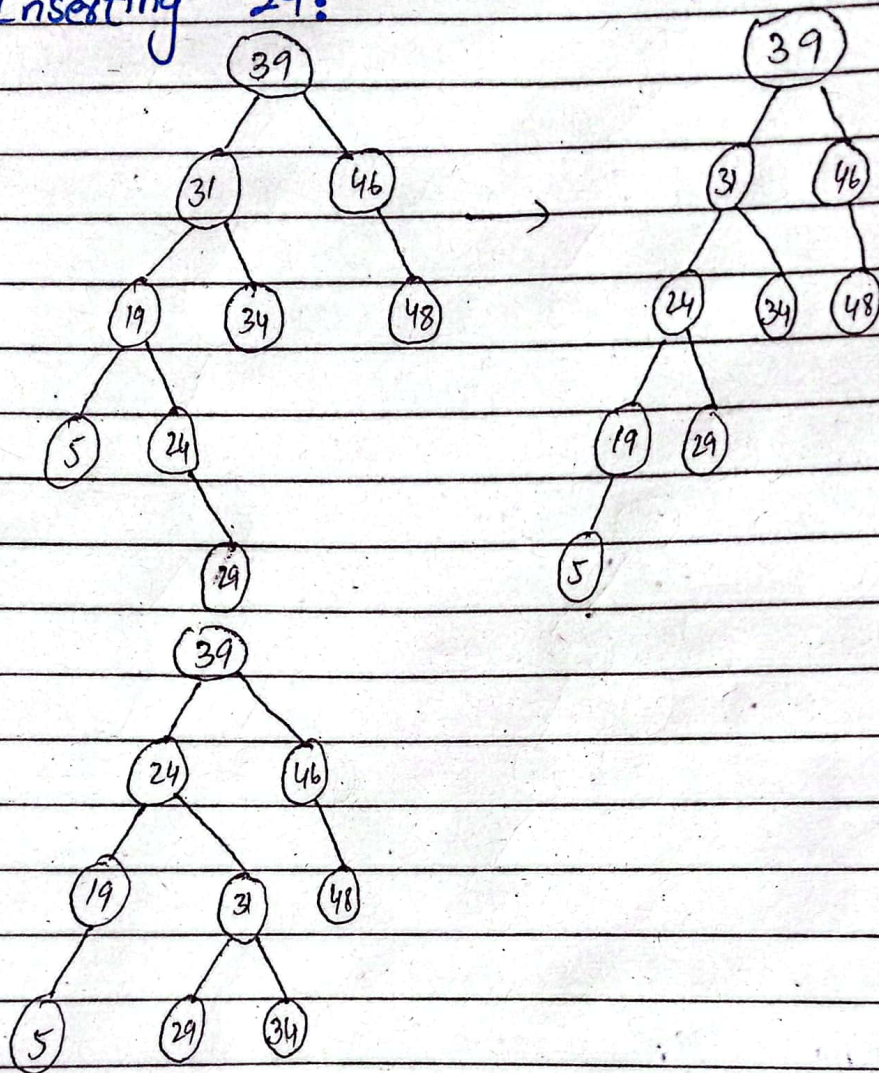
∴ Left Right rotation.
is the required AVL Tree