1.

a.

A picture containing text, device, meter, gauge

Description automatically generated

b.

inorder: 10 15 20 25 30 32 40 50 60 65 70 78 80

preorder: 50 20 10 15 40 30 25 32 60 70 65 80 78

postorder: 15 10 25 32 30 40 20 65 78 80 70 60 50

c.

Chart, scatter chart

Description automatically generated with medium confidence

2.

a.

struct Node

{

int value;

Node\* parent;

Node\* leftChild;

Node\* rightChild;

}

b.

insert(insertNode):

if the tree is empty:

mark insertNode as the root node

set insertNode's parent to nullptr

return

current node = root node

while true:

if insertNode's value is less than or equal to current node's value

if current node has a left child:

current node = current node's left child

else:

mark insertNode as current node's left child

set insertNode's parent to current node

return

else:

if current node has a right child:

current node = current node's right child

else:

mark insertNode as current node's right child

set insertNode's parent to current node

return

3.

a.

A picture containing text, clock, watch

Description automatically generated

b.

count = 6

{ 7, 5, 6, 4, 0, 2 }

c.

count = 5

{ 6, 5, 2, 4, 0 }

4.

a. O(C + S)

b. O(log(C) + S)

c. O(log(C) + log(S))

d. O(log(S))

e. O(1)

f. O(log(C) + S)

g. O(Slog(S))

h. O(Clog(S))