1) a)

b)

c)

* Pre-order: 50 20 10 15 40 30 25 35 60 70 65 80 75
* In-order: 15 10 20 25 30 35 40 50 60 65 70 75 80
* Post-order: 15 10 25 35 30 40 20 65 75 80 70 60 50

2) (a)

(b)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 7 | 3 | 5 | 1 | 2 | 4 |

(c)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5 | 3 | 4 | 1 | 2 |

3)

class BST

{

public:

BST(int value)

{

root=nullptr;

}

private:

struct node

{

node(int value)

{

val=value;

lchild=nullptr;

rchild=nullptr;

}

int val;

node \*lchild, \*rchild;

};

node \*root, \*parent;

};

pseudocode:

If tree is empty

Create new node and set val to value

Point root to new node

Return

Set parent to root

While not done

If value equals parent’s val

Return

Else if vale less than parent’s val

If there is a left child

Move parent to left child

Else

Make a new node and set val to value

Set parent’s left pointer to this node

Return

Else if vale greater than parent’s val

If there is a right child

Move parent to right child

Else

Make a new node and set val to value

Set parent’s right pointer to this node

return

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(S)

h) O(C log S)