Chapter 7 Answers to some of questions

True/False Questions
1) False (two children restriction is only for binary trees)
2) False (it is the length of the path, which follows edges/arrow down to the node)
3) True
4) False (a complete binary tree might be missing some nodes to become a full binary tree)
5) True

Multiple Choice questions
2) d)
3) b) (because 4! = 1*2*3*4 = 24)

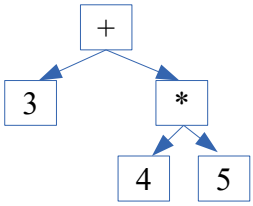
Short-Answer questions

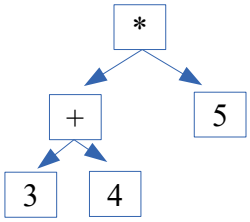
2)
preorder traversal: 10, 6, 3, 5, 4, 8, 7, 15, 12, 11, 17, 16
(root, then left, then right)
in-order traversal: 3, 4, 5, 6, 7, 8, 10, 11, 12, 15, 16, 17
(left, then root, then right)
postorder traversal: 4, 5, 3, 7, 8, 6, 11, 12, 16, 17, 15, 10
(left, then right, then root)

3) invariant for the BST tree:
If you recall, ***class invariant*** is a property or a set of properties that define a consistent state for an instance of a class (page 124 in our book).
Similarly to this definition, invariant of a BST would be a set of properties that are consistent for every BST.
Hence we can say that invariant for the BST tree could be:
BST is a binary tree such that for every node, the value of each node in its left subtree is less than or equal to the node's value, and the value of each node in its right subtree is greater that the node's value.

4) BST delete operation
pre: the tree is a binary search tree, item is the value to be deleted from the BST
post: the tree is a binary search tree, with item removed from it

6)





this tree corresponds to the "usual" interpretation of the given expression.
Its evaluation following the algorithm given in Section 7.3 will produce 23.