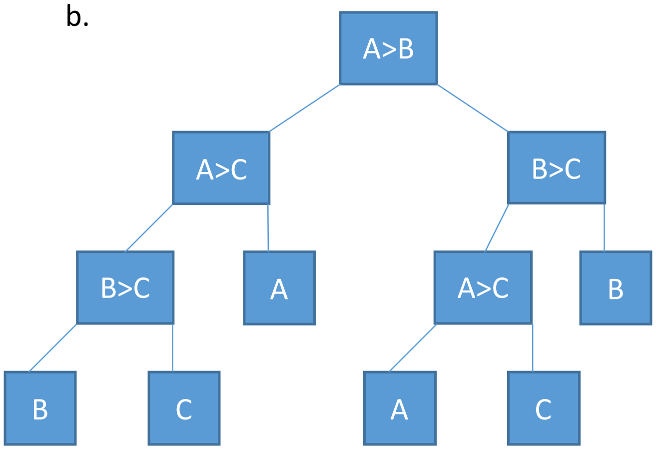
1)

a. ceil(log2(6)) = 3 comparisons

b.



c. Algorithm has 3 comparisons max.

2) Assuming the first element of the double linked list's predecessor is the last element.

	Unsorted, singly linked	Sorted, singly linked	Unsorted, doubly linked	Sorted, doubly linked
SEARCH(L, K)	O(n)	O(n)	O(n)	O(n)
INSERT(L, x)	O(1)	O(n)	O(1)	O(n)
DELETE(L, x)	O(n)	O(n)	O(n)	O(n)
SUCCESSOR(L, x)	O(n)	O(n)	O(n)	O(n)
PREDECESSOR(L, x)	O(n^2)	O(n^2)	O(n)	O(n)
MINIMUM(L, x)	O(n)	O(1)	O(n)	O(1)
MAXIMUM(L, x)	O(n)	O(n)	O(n)	O(1)

3)

a. Down is linked list, right is hash table.

empty	28	20	12	empty	5	15	empty	17
	19	nil	nil		nil	33		nil
	10					nil		
	nil							

b.

Linear	22	88			4	15	28	17	59	31	10
quadratic	22		88	17	4		28	59	15	31	10
Double hashing	22		59	17	4	15	28	88		31	10

4)

	Unordered Array		Ordered Array		Bin search Tree	Assuming not balanced	Hash Table	
	Best	Worst	Best	Worst	Best	Worst	Best	Worst
insert	O(1)	O(1)	O(1)	O(n)	O(logn)	O(n)	O(1)	O(n)
delete	O(1)	O(n)	O(n)	O(n)	O(logn)	O(n)	O(1)	O(n)
search	O(n)	O(n)	O(n)	O(n)	O(logn)	O(n)	O(1)	O(n)