CS2515

2023/24

SAMPLE CLASS TEST 2

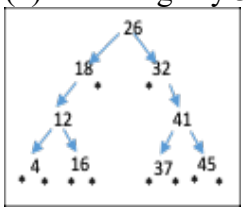
You have 45 minutes to complete answers to these questions.

Write your answers directly onto the question sheet.

1. State the specific properties of *Binary Search Tree* (you do not have to define a Binary Tree).

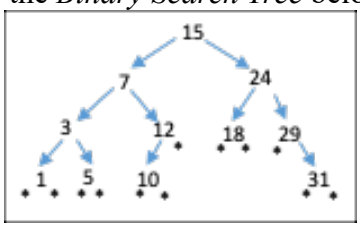
(2 marks)

2. For the *Binary Search Tree* below, show the result of
(a) adding key 23, and then
(b) removing key 32



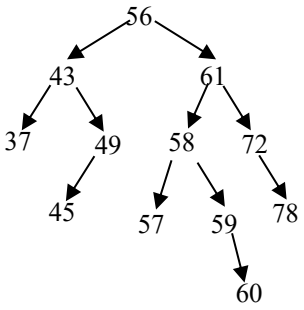
(4 marks)

3. For the *Binary Search Tree* below, show the result of removing key 15.



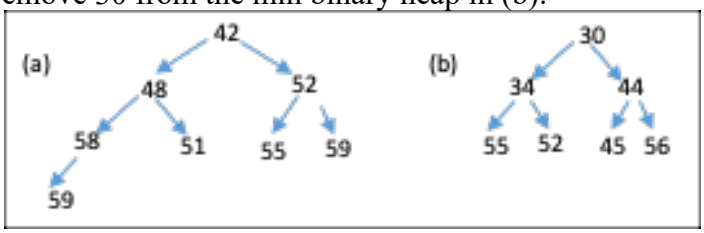
(4 marks)

4. For the sample AVL tree below, show the result of removing 56.



(6 marks)

5. The two trees below represent *min Binary Heaps* (and so they are **not** Binary Search Trees). Show the results when you add 44 to the min binary heap in (a), and you remove 30 from the min binary heap in (b):



(6 marks)

6. We are given the following hash function, represented as a lookup table:

input:	120	121	122	123	124	125	126	127
hash:	6935	7218	9426	8114	3427	9516	4354	6414

If we start with a hash table implemented using an empty array of size 10, where the table is using open addressing with linear probing, show the changes to the array as we execute each of the following steps in turn, using the above hash function. There is no need to grow the array.

Steps	0	1	2	3	4	5	6	7	8	9
setitem(123,'x')										
setitem(125,'y')										
setitem(127,'w')										
setitem(120,'z')										
delitem(127)										
setitem(125,'t')										
setitem(126,'p')										

(8 marks)

Total: 30 marks

END OF PAPER