

PART B - SET 7

Note: For all questions show step by step calculation

- 1a You are given a reasonably balanced binary search tree T. The tree, however, is slightly modified so that for every node, the value of its left child is greater than its own value and the value of its right child is less than its own value. Assume that there is a function *INSERT_BST(num)* that takes an integer argument 'num' and inserts it into a BST (with the usual definition). Construct a left skewed BST T1 containing exactly the same elements as in T. You are allowed to use the *INSERT_BST* function but cannot make any modifications to the function itself.

(2 marks)

- 1b Consider an initially empty binary search tree. Perform the following operations on the tree and draw the resultant tree at the end of each operation

- Insert 24, 33, 19, 17, 34, 10, 5
- Delete 24, 34

(3 marks)

- 2a Illustrate (step by step) the operation of BUILD_MIN_HEAP on the array
A = {5, 3, 17, 10, 84, 19, 6, 22, 9}

(2 marks)

- 2b Sort the following array in ascending order using Selection_Sort.

6	2	7	1	3
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Show the contents of the array after every iteration of the sort (**Iteration 0** is the input array).

(2 marks)

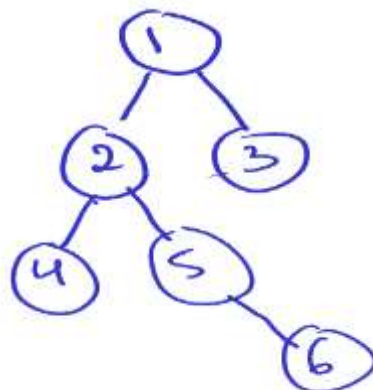
- 2c Give the best case, average case and worst case time complexity of the Selection_Sort.

(1 mark)

- 3a Write BFS traversal algorithm and determine its time complexity.

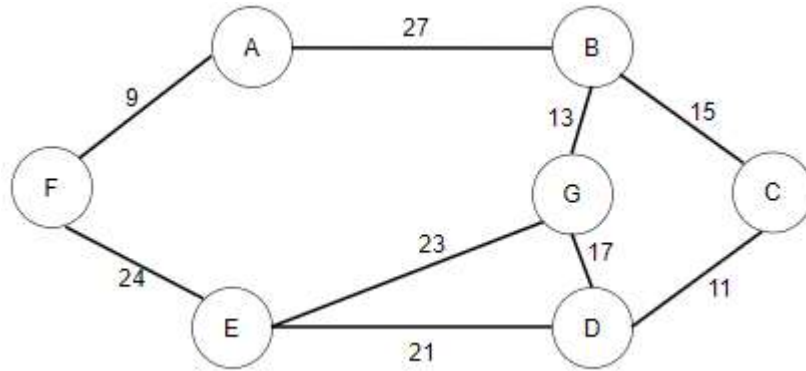
(4 marks)

- 3b Identify Breadth First Traversal (BFS) for the following graph.



(1 mark)

- 4a Construct the minimum Spanning tree (MST) for the given graph using Kruskal's Algorithm (Note that the appropriate steps should be followed for the answer).



(4 marks)

4b Minimum Number of edges required to connect 600 vertices is_____.

(1 mark)