School of Computing & IT NOV 2017

III Semester B. Tech Second Sessional Examination

CS1303:Data Structures

OPEN BOOK EXAMINATION

Duration : 1hrs **Max Marks: 15**

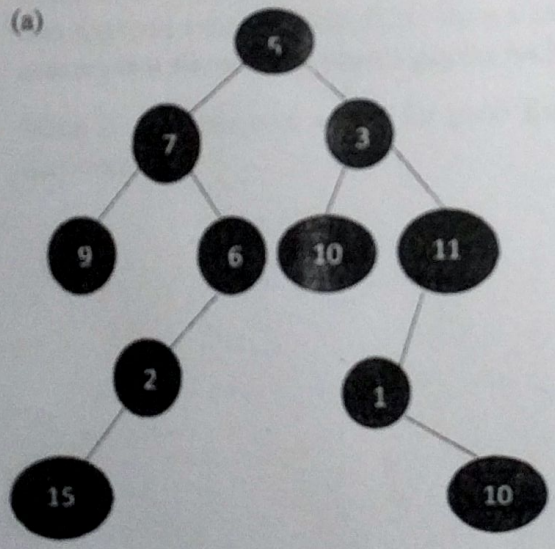
Note: Any missing or misprinted data may be assumed suitably.
Clearly explain the steps of constructions for the problems that have been asked in Q3, Q4 and Q5.
Algorithm in place of 'C' code and vice-versa will not be permitted and no marks will be given.

Q 1 Write a function in 'C' to insert an integer element "**Item**" in the existing priority queue. Assume that the priority queue is implemented using 2D array.
The signature/prototype of the function is: **void insertinPriQueue (int PQ[M][N], int FR[M][2], int Item, int P)**
Dimensions M and N of the Priority Queue "**PQ**" are known globally, where row indices represent priorities, i.e., 0, 1, 2,..., M-1, and the size of queue corresponding to each priority is N; **FR** contains the position of Front and Rear corresponding to each priority queue. **Task**: an integer element "**Item**" of priority "**P**" is to be inserted in the existing priority queue. [3]

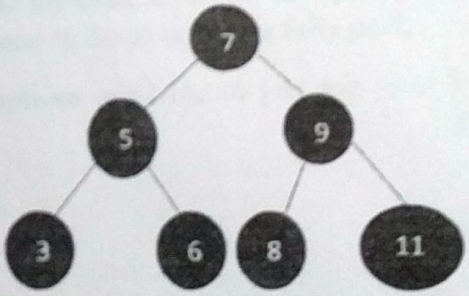
Q 2 Write the iterative, i.e., non-recursive algorithm to process the nodes of binary tree in breadth first order. For example, breadth first order of the Q3 (b) will be 7, 5, 9, 3, 6, 8, 11. The signature of the algorithm is: BredthFirstSearch(Root). [3]

Q 3 Determine pre-order, in-order and post-order traversal results of the following binary trees with explanation. [1+1+1]

(a)



(b)



Q 4 Construct the binary tree from the following traversals. Provide explanation of the construction also. [1.5 + 1.5]
(a) In-order: 14, 12, 9, 10, 11, 4, 8, 5, 6, 7, 3, 2, 1; Post-order: 14, 12, 10, 11, 4, 9, 6, 7, 2, ,1, 3, 5, 8
(b) In-order: 8, 1, 3, 7, 13, 9, 2, 6, 12, 10, 11, 5; Pre-order: 2, 3, 8, 1, 7, 9, 13, 6, 10, 12, 5, 11

Q 5 Construct an AVL search tree by performing following operations in the order of their occurrence. [3]
Insert: 61, 3, 42, 24, 10, 99, 110, 2,1, Delete: 61, 110 Insert: 133, 96 Delete: 1, 3
Note: clearly show the steps of constructing AVL search tree.