

Total No. of printed pages = 2

SUBJECT CODE = INT054103

Roll No. of candidate

--	--	--	--	--	--	--	--	--	--

2017

End Semester M.Sc. (IT) Examination

1st Semester

ADVANCED DATA STRUCTURES

Full Marks- 70

Pass Marks- 21

Time- 3 hours

The figures in the margin indicate full marks.

PART – A

Q.1. Answer all questions:

(16 x 1 = 16)

- a) Define Top-down approach.
- b) Define and show a doubly linked list.
- c) What is the TOP of a stack?
- d) What are REAR and FRONT of a queue?
- e) Define Parent and Leaf node.
- f) What is a Binary Search tree?
- g) What is an AVL tree?
- h) Define B-Tree.
- i) What is linear search?
- j) Write the “mid” value for an interpolation search.
- k) What are the types of sorting?
- l) Define Insertion sort.
- m) Define directed and undirected graphs.
- n) What is degree of vertex?
- o) Define Bi-connected graph.
- p) What is a bridge?

PART – B

Q.2. Answer all questions:

(3.5 x 4 = 14)

- a) Write the algorithm for PUSH operation in a Stack.
- b) Explain B+ Tree.
- c) Write the algorithm for Binary Search.
- d) What are Big Omega and Theta Notations.

PART – C

(10x4=40)

Q.3. Write the algorithms for insertion at beginning, insertion at the end, deletion from beginning and deletion from end of a Linear Linked List.

OR

Consider a circular queue of maximum 6 elements. REAR=4, FRONT=2. Queue is: _ , L , M , N , _ , _ .

(a) Add O, (b) Add P, (c) Delete 2 letters, (d) Add Q,R,S, (e) Delete 1 letter.

Q.4. Draw BST from the elements : 40,25,70,22,35,60,80,90,10,30. Then apply (a) Delete node 30, (b) Delete node 80. (c) Delete node 40. Again draw a new BST using 10,20,30,40,50 and construct a balanced AVL tree, delete the last two keys in the order of LIFO.

OR

Given the pre-order and in-order traversals of a binary tree, using which construct a binary tree.

Pre-order: ABCDEGFHIJ, In-order: BCAEGDHFJI.

Construct a B-Tree of Order 3 by inserting numbers from 1 to 10.

Q.5. An Array A contains elements: <5,8,15,25,30,40,55>. Data=30 is to be searched using Binary Search. What are the drawbacks of binary search?

OR

Illustrate the operation of Bubble sort and Selection sort on the array A= <5,2,1,4,3,7,6>

Q.6. Explain the Set representation and Adjacency Matrix Representation of Graph in details.

OR

Explain the Breadth First Search technique for traversing a Graph. Show an example.