Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

M.Sc.(IT) (2016 to 2018) (Sem.–2)

DATA STRUCTURES

Subject Code : MSIT-203

M.Code : 72730

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and student has to attempt any ONE question from each SECTION.**
2. **SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.**

SECTION-A

1. Write algorithms to add and delete a node from circular linked list.

2. Convert the following infix expression into postfix and prefix expression :

   A/(B*D)/E + F *(G / H * K)

SECTION-B

3. Construct the binary tree with the help of In-order and Post-order traversal of a binary tree given below :

   In-order traversal : X, U, Y, Z, P, Q, R, S, T

   Post-order traversal : U, Y, X, Q P, S, T, R, Z

4. How AVL trees are different from binary search trees? How a node can be deleted from AVL tree? Discuss with the help of suitable example.

SECTION-C

5. What is the difference between depth-first traversal and breadth-first traversal? Write an algorithm for depth-first traversal of a graph.

6. How shortest path between two nodes can be found in a graph with the help of Dijkstra's algorithm? Discuss the time-complexity of Dijkstra's algorithm.

SECTION-D

7. Explain Insertion Sort algorithm by taking a suitable example. Calculate the time-complexity of insertion sort algorithm in best-case, average-case and worst-case.

8. Discuss the operations and applications of Hash as a data structure.

SECTION-E

9. Write briefly :

a) Define garbage collection.

b) What is the difference between stack and queues?

c) Write an application of doubly linked list.

d) What is a binary tree?

e) Name any two applications of graphs.

f) What is dynamic memory management?

g) How binary search is different from linear search?

h) What is an adjacency matrix?

i) What is the need of data structures?

j) What is the worst case time complexity of Bubble sort?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.