

Roll No.

Total No. of Pages : 02

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M.Sc.(IT) (2016 to 2019) (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.