

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

M.Sc.(IT) (2019 Onwards) (Sem.-2)

**DATA STRUCTURES**

Subject Code : MSIT-203

M.Code : 72730

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

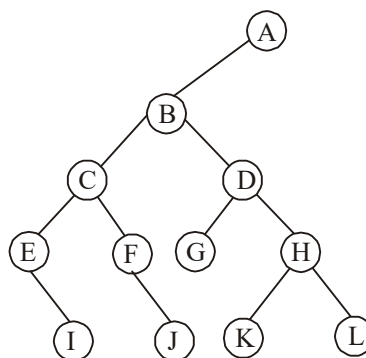
1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and student has to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.
3. Use of Non-programmable scientific calculator is allowed.

**SECTION-A**

- 1) Write short note on :
  - a) Trade-off between algorithms
  - b) Static vs. Dynamic Memory Management
- 2) a) What is a linear linked list? Write an algorithm to add an element to the front of the list?  
b) Explain how stack and queues can be implemented using lists?

**SECTION-B**

- 3) a) With reference to the b-tree in Fig.1, give the three traversal



**FIG.1**

- b) Define almost complete b-tree. Is the tree in Fig. 1 an almost complete b-tree?
- 4) Explain the algorithms and applications involved in Heap.

### SECTION-C

- 5) Explain the adjacency lists in graph representation in detail using example.
- 6) Explain searching operations of various types of graphs.

### SECTION-D

- 7) How efficient is the sequence search? Explain the different methods used to get maximum search efficiency.
- 8) Explain different methods for resolving hashing collisions with examples.

### SECTION-E

- 9) **Write briefly :**
  - a) Explain types of Linked List.
  - b) Enqueue versus Dequeue
  - c) Depth and Height of a tree
  - d) Complexity of Quicksort
  - e) Priority Queue
  - f) What are Heighted Balanced (AVL) tree?
  - g) Indexed Sequential Search
  - h) Expression Tree
  - i) Efficiency of Recursion
  - j) Dynamic Stack Representation

**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.**