

Roll No. ....

67071

MCA 2nd Semester (Non CBCS Scheme) w. e. f. May – 2013 Examination – May, 2019

DATA STRUCTURE

Paper : MCA-201

Time : Three Hours ] [ Maximum Marks : 80

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is compulsory. Attempt four more questions, selecting one question from each Unit.

- 1. (i) Define an array. Explain the sequential allocation method. (ii) Describe the concept of polish notation. (iii) Define the tree and write the properties of a tree (iv) What do you mean by deque and priority queue. (v) Explain the concept of Garbage collection.

- (vi) Explain overflow and underflow conditions of a stack with examples. (vii) Describe the concept of free - storage list. (viii) What is the main difference B- tree and B+- tree ?

2 x 8 = 16

UNIT – I

- 2. (i) Explain Big-Oh notation with the help of example. 8 (ii) Explain various data structure operation. 8 3. (i) Define string and explain the string operation by giving suitable examples. 8 (ii) What are the characteristics possessed by an algorithm ? 8

UNIT – II

- 4. (i) Write a program that read two matrices A and B of order m\*n and compute the following C = A + B. 8 (ii) Describe a method to convert an infix expression in to a postfix expression with the help of a suitable example. 8 5. (i) What is doubly ended queue ? Write a program/algorithm to implement a doubly ended queue (deque). 8

- (ii) Explain the sparse array. How can you store the sparse array in memory ? Explain by giving suitable example. 8

**UNIT - III**

- 6. (i) Explain the insertion and deletion operation of B-tree by giving suitable example. 8
- (ii) What is a circular linked list ? What are its advantages over linear linked list ? Write a program/algorithm to insert a node at desired position in a circular linked list. 8
- 7. (i) Define the following terms : 2 x 4
  - (a) Root
  - (b) Leaf nodes
  - (c) Empty tree
  - (d) Sub tree ()
- (ii) Describe binary search trees and its applications. <https://www.haryanapapers.com> 8

**UNIT - IV**

- 8. (i) Define : 8
  - (a) Graph
  - (b) Multigraph
  - (c) Complete graph
  - (d) Connected graph
  - (c) Tree graph

- (ii) Explain various ways of graph traversal by giving suitable example. 8

- 9. (i) What is hashing ? What are the different methods used for calculating hash functions ? Explain with suitable examples. 8
- (ii) What kind of data structure is typically appropriate for sorting an adjacent matrix ? 8

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