

MCA-06 (New) / MCA-7 (Old)

June - Examination 2016

MCA 1st Year Examination**Data Structure Through C Language****Paper - MCA-06 (New) / MCA-7 (Old)****Time : 3 Hours]****[Max. Marks :- 80**

Note: The question paper is divided into three sections A, B and C with marking scheme.

Section - A**8 × 2 = 16**

(Very Short Answer Questions)

Note: Answer **all** questions. As per the nature of the question delimit your answer in one word, one sentence or maximum upto 30 words. Each question carries 2 marks.

- 1) (i) Define Data Structure.
- (ii) Define Graph.
- (iii) What is the importance of LIFO?
- (iv) What are the two types of complexity?
- (v) What is linked list?
- (vi) What is "Self loop" in graph?
- (vii) What is Binary Search Tree?
- (viii) What is complexity of bubble sort in best case?

Section - B**4 × 8 = 32**

(Short Answer Questions)

Note: Answer **any four** questions. Each answer should not exceed 200 words. Each question carries 8 marks.

- 2) What is doubly linked list? How it is more important than singly link list?
- 3) Explain big O, Omega (Ω) and theta (θ) notation in the complexity with graph.
- 4) Write an algorithm to insert an element into a single linked list.
- 5) Define array as data structure and its operation. Write an algorithm to read $m \times n$ matrix using row major mapping.
- 6) Convert infix expression x into postfix form showing stack status after every step in tabular form:
$$x : A + (B * C - (D / E - F) * G) * H$$
- 7) What is queue? What are the different operations perform on it? How the queue is implemented using linked list?
- 8) Suppose an array A contains 8 elements as follows:
77, 33, 44, 11, 88, 22, 66, 55
Sort this array using bubble sort.
- 9) Differentiate between:
 - (i) BFS and DFS
 - (ii) Tree and Graph

Section - C**2 × 16 = 32**

(Long Answer Questions)

Note: Answer **any two** questions. You have to delimit your each answer maximum upto 500 words. Each question carries 16 marks.

- 10) What is Binary search tree? Explain the process of searching a key value in binary search tree with example.
- 11) Write algorithm for inorder, post order and pre order traversal of a binary tree stored in an array. Test your result with given array element values:
71, 27, 23, 29, 180, 143, 78, 28, 30
- 12) Explain any two algorithm with example:
 - (i) Quick sort
 - (ii) Bubble sort
 - (iii) Insertion sort
- 13) Write short notes (any two):
 - (i) Adjacency matrix
 - (ii) Graph Traversal
 - (iii) Stack representation using linked list