



PG – 510

**II Semester M.C.A. Examination, June 2015
(CBCS)
MCA – 201T : DATA STRUCTURES**

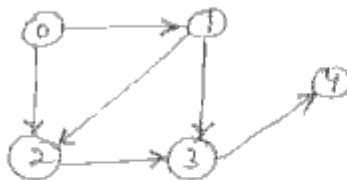
Time : 3 Hours

Max. Marks : 70

PART – A

Answer **any five** questions :**(5×6=30)**

1. What is recursion ? What are the various types of recursion ? Explain with an example.
2. What do you mean by asymptotic behaviour of a function ? What are the different types of asymptotic notations ?
3. Write an algorithm to sort 'n' numbers using selection sort.
4. What is a sparse matrix ? Design an algorithm to search an item in sparse matrix.
5. What is ADT Stack ? Write an algorithm to convert expression from infix notation to postfix notation.
6. What is a weighted graph ? Write the adjacency matrix for the following graph :



7. What is a priority queue ? Explain operations and applications of queues.
8. What is a binary search tree ? What are the different types of binary search trees ? Explain.

P.T.O.

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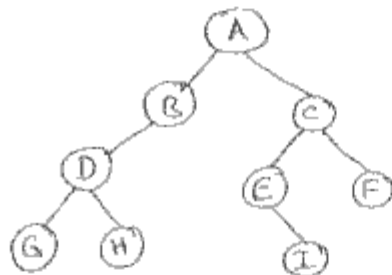


PART – B

Answer **any four** questions .

(4×10=40)

9. a) Write an algorithm to illustrate Bubble Sort. Write the time complexity. 5
 b) Write a recursive program to find the factorial of 'n'. 5
10. a) Illustrate the concept of circular queue. 5
 b) Obtain the prefix expression for $((a + (b - c) * d) ^ e + f)$. 5
11. a) List out differences between singly linked list and doubly linked list. 5
 b) Write an algorithm to concatenate two lists into a single list. 5
12. a) What is tree traversing ? What is pre-order traversing for the following tree : 5



- b) Given a doubly linked list with elements {5, 6, 9, 10, 12} 5 being the first element, and 12 being the last element, write an algorithm to insert element in the doubly linked list and show the proof for inserting an element between 6 and 9. 5
13. a) Sort {6, 9, 4, 3, 7, 5} using minimum heap, heap sort algorithm. 5
 b) Write a function to insert an item into a binary search tree. 5
14. Write short notes on . 10
 i) Warshall's Algorithm
 ii) Row major representation of a matrix.