YMCA University of Science & Technology, Faridabad
MCA EXAMINATION (Under CBS)
Data Structures (MCA-16-102)

Time : 3 hrs **M.Marks: 60**

Note: Part-I is compulsory. In part-II, attempt any four questions out of six questions.

Part-I

[10 * 2= 20]

Q1.(a) What is data structure? Write down applications of various data structures.

(b) What do you mean by algorithm. Explain the concept of time and space complexity.

(c) Write down the prefix and postfix notation of following:

- (A - S / M) * (K + L) / s
- X * (D + C) / N -E * F

(d) What would be the complexity of bubble sort if elements are already in ascending order.

(e) What do you mean by Queue? Write its applications.

(f) Write down the advantages of two way linked list over one way linked list .

(g) Write down in brief the traversal techniques of Trees.

(h) What do you mean by sparse matrix. Show its representation using array.

(i) What do you mean by tree? Write its applications.

(j) What is Binary search? What is complexity of Binary search?

Part – II

[4*10=40]

Q2.(a) Write an algorithm to sort elements using selection sort. Explain it with an example and find its complexity.

(b) What do you mean by queue? Write an algorithm to insert an element in linear queue using array.

(5+5=10)

Q3. (a) Write an algorithm to insert an item in one way linked list at beg and at the end.

(b) Write an algorithm to push and pop element from stack. (5+5=10)

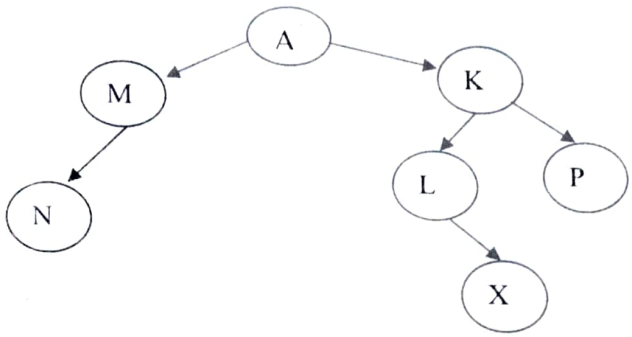
Q4. What do you mean by Binary tree. Write an algorithm to search an element from binary search tree.

(10)

Q5. (a) What do you mean by Graph. Explain memory representation of graph. Write an algorithm to traverse graph using DFS .

(10)

Q6. (a) Find preorder, postorder and inorder for the given tree.



(b) Write an algorithm to create Binary search. Explain it with an example. (5+5=10)

Q7. Write short note on any two:

(a) Direct file organization

(b) B-Tree

(c) Kruskal's method for minimum spanning tree. (5+5=10)