

Roll No. 

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Total No. of Pages : 02

Total No. of Questions : 09

**M.Sc.(IT)/PGDCA (Sem.-2)**  
**DATA STRUCTURES**  
Subject Code : PGCA-1913  
M.Code : 77842  
Date of Examination : 14-07-22

Time : 3 Hrs.

Max. Marks : 70

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

**SECTION-A**

**I. Write short notes on :**

- a) How you can traverse elements of a binary tree? Explain with example.
- b) Compare stack and queue data structures.
- c) What is a spanning tree? Give example.
- d) Write algorithm for bubble sort?
- e) What are linear and non-linear data structures?
- f) What is a stack? Write applications of stack.
- g) Compare single and Double linked list.
- h) Discuss indexed sequential search.
- i) Compare Array and Linked list.
- j) Discuss tree traversals.

### SECTION-B

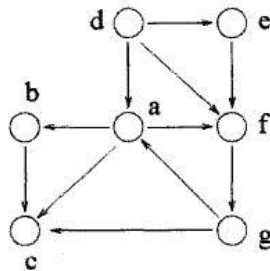
2. Write an algorithm to convert infix to postfix expression. Apply the same on the following expression.

$$d + (x * y + (a / b \uparrow q) + n) * z$$

3. Write an algorithm to insert a new node in the existing sorted single linked list. Discuss your algorithm with the help of a suitable example.
4. a) Define binary tree. How it is represented in memory? Explain with examples.  
b) What are threaded binary trees? How these are designed? Give example.
5. Define Queue. Write algorithm how you can insert and delete an element from a linear queue. Write its limitations also.

### SECTION-C

6. Find all the nodes approachable from d using BFS graph traversal algorithm. Show all the intermediate steps.



7. Explain the binary search algorithm using a suitable example. How binary search differs from linear search.
8. What is a Heap? How it is used in heap-sort. Write algorithm for heap-sort and discuss with following example.

12 38 15 19 52 48 74 50 45

9. What do you mean by Hashing? Explain various methods of hashing. How collisions are handled during addressing in hashing?

**NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.**