

Con. 6518-13.

GS-6354

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is **compulsory**.(2) Attempt any **four** questions out of remaining **six** questions.

1. (a) Explain linear and non-linear data structure with example. 5
 (b) What is recursion ? State its advantages and disadvantages. 5
 (c) What is AVL tree ? Explain with example. 5
 (d) Explain Abstract data type. 5
2. (a) Write any Pattern Matching Algorithm and explain it with suitable example. 10
 (b) Write a program to implement queue using Array. 10
3. (a) Write a program to search an element in an array using binary search technique. 10
 (b) Write algorithm for heap sort and explain Descending heap with suitable example. 10
4. (a) Hash the following in a table of size 12. Use any two collision resolution technique. 10
 98, 20, 94, 27, 67, 99, 41, 0, 4, 17, 2, 15.
 (b) Write a program to implement a STACK ADT using Linked List. 10
5. (a) Write and explain QUICK SORT algorithm with suitable example. 10
 (b) Write an algorithm to traverse a graph using :- 10
 (i) Breadth first search
 (ii) Depth first search.
6. (a) Define Binary Tree. Write an algorithm to implement INSERTION and DELETION operation. 10
 (b) What is Doubly Linked List ? Write an algorithm to implement following operations :- 10
 (i) Insertion (All Cases)
 (ii) Traversal (Forward and Backward).
7. Write short note(s) on (any four) :- 20
 (a) Shortest Path Algorithm
 (b) Priority and Circular Queue
 (c) Red and Black Tree
 (d) Pattern Matching
 (e) Expression Tree.