

PUNE VIDHYARTHI GRIHA'S  
COLLEGE OF SCIENCE AND TECHNOLOGY  
S.Y. B.SC (INFORMATION TECHNOLOGY) - SEM-III  
SUB: DATA STRUCTURE  
SET: B

Q.P CODE: USIT302

(TIME :2 ½ Hrs.)

TOTAL MARKS :75

**N.B:-**

1. All questions are compulsory.
2. Answers to the same question must be written together.
3. Numbers to the right indicate full marks.
4. Draw neat labeled diagrams wherever necessary.
5. Use of Non-programmable calculators are allowed.

**Q1) Attempt the following (Any three) (Each of 5 marks)**

**[15M]**

- a. What is data structure & explain primitive and non-primitive data structure
- b. Explain row major order & column major order in array.
- c. What is algorithm & write a algorithm to find out even number or not
- d. Write a program to insert an element of an array
- e. Explain Memory Representation of One- & Two-Dimensional Array
- f. Define: Rate of Growth and Big O Notation.

**Q2) Attempt the following (Any three) (Each of 5 marks)**

**[15M]**

- a. Explain following algorithm about Linked List:
  1. Searching
  2. copying
- b. Write an algorithm to insert a node int single linked list.
- c. Difference between array and linked list.
- d. Difference between Static memory allocation and Dynamic memory allocation
- e. Explain Traversal of Linked List.
- f. Representation of Polynomials.

**Q3) Attempt the following (Any three) (Each of 5 marks)**

**[15M]**

- a. Basic Operation on stack
- b. Explain the concept of recursion.
- c. Application of Queue
- d. Mery representation of Queue
- e. Write short note on Stack Memory Representation.
- f. What are the Applications of Stack?

**Q4) Attempt the following (Any three) (Each of 5 marks)**

**[15M]**

- a. Explain merge sort
- b. Explain types binary tree
- c. Explain properties and operation on B TREE]
- d. Define Heap With memory representation.
- e. List the Operations performed on AVL Tree.
- f. write algorithm for binary search.

**Q5) Attempt The following (Any three) (Each of 5 marks)**

**[15M]**

- a. Write a short note on hash technique.
- b. Explain concepts :            i. separate chaining            ii. open addressing
- c. Explain Shortest Path Problems with example.
- d. Explain Adjacency List or Linked Representation of Graph.
- e. List the different techniques of collision resolution techniques. Explain any 1 technique in detail.
- f. Explain application of graph