

B.Sc. Information Technology 3rd Semester

DATA STRUCTURE

Paper—II

Time Allowed—3 Hours] [Maximum Marks—75

Note :— (1) Attempt *one* question each from Sections A, B, C and D and *fifth* question from any section.

(2) All questions carry equal marks. Use of non-programmable calculator is allowed.

SECTION—A

1. (a) What is data structure ? Explain various operations. 8
 (b) How arrays are represented in memory ? Explain various operations. 7
2. (a) What is algorithmic complexity ? How Big-O notation is applied to measure it ? Explain. 8
 (b) What is array ? Explain their types. Also explain multidimensional arrays in detail. 7

SECTION—B

3. (a) Explain various types of linked lists along with their advantages over arrays. 8
 (b) How an arithmetic expression is converted from in-fix to polish notation and is evaluated ? Explain. 7
4. (a) Explain various operations on linked-lists. 8
 (b) Explain how quicksort is performed to sort an array. 7

SECTION—C

5. (a) What is queue ? How queues are implemented using linked lists ? 8
 (b) Explain binary trees along with their memory representation. 7
6. (a) Explain the concepts of “priorities of queues” and dequeues. 8
 (b) What is tree ? Explain Binary Search Trees. 7

SECTION—D

7. (a) What is graph ? Explain how are they implemented using adjacency matrix. 5
 (b) Explain Bubble sort. 5
 (c) Explain linear search. 5
8. (a) How graphs are implemented using path matrix ? Explain through example. 5
 (b) How sorting is performed in general ? 2
 (c) How Binary search is performed ? 8