

# PC-1502/M

L-18/2051

DATA AND FILE STRUCTURES-122  
(Semester-II)

Time : Three Hours]

[Maximum Marks : 70

**Note :** Attempt *two* questions each from Section A and B.  
Section C will be compulsory.

## SECTION-A

- I. (a) Define array. Discuss insertion and deletion in an array. (6)
- (b) Explain sparse array and sparse matrix with example. (4.5)
- II. (a) What are queues? Explain circular queues and priority queues with example. (7.5)
- (b) Discuss *three* applications of stacks. (3)
- III. (a) Explain Binary trees along with its important properties. (6.5)
- (b) Explain B-tree in short. (4)

IV. Explain the following : (10.5)

- (i) Infix and post-fix notation.
- (ii) Doubly linked list.
- (iii) Two operations on stacks.

### SECTION-B

V. Explain the following : (10.5)

- (i) Hash functions.
- (ii) Adjacency Matrix.
- (iii) Heap sort.

VI. (a) Define graph. Explain vertex and edge in graphs. (4.5)

(b) Explain any *three* operations which can be performed on graphs. (6)

VII. (a) Explain quick sort. Sort the following list using quick sort and show sorting at each steps.

4, 42, 53, 3, 13, 58, 77, 99, 20, 30. (7.5)

(b) Explain selection sort in short. (3)

VIII. Explain the following :

- (i) SASD.
- (ii) DASD.
- (iii) Direct file organization.

## SECTION-C

### (Compulsory Question)

- IX. (a) Explain link list. (3)
- (b) Name any *three* hashing techniques. (3)
- (c) Explain balanced tree. (3)
- (d) Give *three* applications of queues. (3)
- (e) Explain indexed sequential organization. (3)
- (f) Explain multidimensional arrays with example. (3)
- (g) Explain adjacency list with example. (3)
- (h) Explain collision resolution. (3)
- (i) Give *three* advantages of sequential file organization. (2)
- (j) What is Big O notation? (2)
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