

# PC-127/AK

O-1/2041

## DATA AND FILE STRUCTURES

Paper – MS(A)-122

Ist Year (Annual)

Time : Three Hours]

[Maximum Marks : 80

**Note :** Attempt *five* questions in all, selecting at least *two* questions each from Section A and B and the entire Section C. Use of Non-programmable scientific calculator is allowed.

### SECTION – A

- I. What do you mean by array? What are the merits and demerits of using arrays? What are sparse arrays? How sparse arrays are stored in memory? Explain. 16
- II. Define a queue data structure. How a linear queue is different from circular queue? Write an algorithm to perform insertion and deletion in a circular queue. 16
- III. What do you mean by a linked list? What are its advantages? Write an algorithm to insert a node in the beginning and in the end of a linked list, when the pointer to its first node is given. 16

- IV. Write short notes on the following :
- (a) Complete binary tree. 4
  - (b) Height of a tree. 4
  - (c) Threaded binary tree. 4
  - (d) Heap. 4

### SECTION – B

- V. What do you mean by graph? What are various graph traversal techniques? Discuss any *one* in detail. 16
- VI. Write an algorithm to implement radix sort. 16
- VII. Differentiate between Sequential Access Storage Device (SASD) and Direct Access Storage Device (DASD). Discuss the working of any *one* DASD device. 16
- VIII. Explain the direct access file organization in detail giving its merits and demerits. 16

### SECTION – C

- IX. (a) What do you mean by time space tradeoff? 2
- (b) How stacks are different from queue data structure? 2
- (c) What are the advantages and disadvantages of doubly linked list? 2
- (d) What is a binary search tree? 2

- (e) Differentiate between tree and graph. 2
  - (f) What is adjacency matrix? 2
  - (g) What is hashing? What are its advantages? 2
  - (h) What are the merits of sequential file organization? 2
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