

(i) Printed Pages : 4] Roll No.

(ii) Questions : 9] Sub. Code :

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**Bachelor of Computer Applications 3rd
Semester Examination**

1127

DATA STRUCTURES

Paper : BCA-16-305

Time : 3 Hours]

[Max. Marks : 65

Note :- Attempt *five* questions in all. Select *one* question each from Sections A-D. Section-E is compulsory.

Section-A

1. (a) What do you mean by data structure ? Brief out basic data structures known to you. Also mention real applications of these data structures. 8
- (b) Write down an algorithm to display the elements of an array which are less than 100. 5
2. (a) What do you mean by Two Dimensional (2D) Array ? What are *two* popular ways of

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representing 2D arrays in memory ? Discuss with examples. 8

(b) What is a stack ? What are the operations that can be performed on a stack ? Brief out. 5

Section-B

3. (a) What is Doubly Linked List ? Mention the steps to insert and delete a node at the end of a doubly linked list. 8

(b) What is a Queue ? What are its main applications ? Discuss. 5

4. (a) Write algorithms to insert and delete elements from a Queue. Also include relevant comments in it. 8

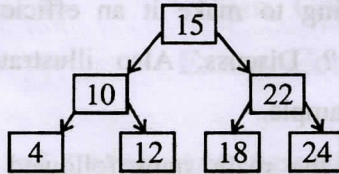
(b) What do you mean by Circular Linked List ? What are its advantages and disadvantages over other linked lists ? Describe. 5

Section-C

5. (a) What is a Binary Tree ? What are the various traversal techniques for a Binary tree ? Elaborate

with the help of following tree.

8



- (b) What is a graph ? What are its main components ? Discuss.

5

6. (a) What is a graph ? How is it represented in memory ? Illustrate commonly used methods with examples.

8

- (b) What do you mean by Binary Search Tree ? What steps are followed to insert a new value in it ? Explain.

5

Section-D

7. (a) What is Bubble sort ? Why is it called Bubble sort ? Show all the steps taken to sort the following list in Bubble sort :

86, 12, 42, 69, 38, 57, 74, 6

8

- (b) Draw a comparison between Linear and Binary search techniques.

5

8. (a) How Divide and Conquer approach is used in Quick sorting to make it an efficient sorting technique ? Discuss. Also illustrate with a suitable example. 8
- (b) List down the main steps followed to find a number with binary search. 5

Section-E

(Compulsory)

9. (a) What is space-time tradeoff of algorithms ? 2
- (b) List down applications of stacks. 2
- (c) How does circular queue vary from a simple queue ? 2
- (d) How do you represent a polynomial expression using linked list ? 2
- (e) How do you find depth of a binary tree ? 2
- (f) What are the benefits of using Merge Sort ? 2
- (g) What is the time complexity of binary search algorithm ? 1