

2021
Bachelor of Computer Application
Third Semester
BCA-16-305: Data Structures

Time allowed: 3 Hours

Max. Marks: 65

NOTE: Attempt five questions in all, including Question No. IX (Unit-V) which is compulsory and selecting one question each from Unit I - IV.

x-x-x

UNIT – I

- I. a) What are data structures? Explain various operations that can be performed on data.
b) Explain algorithms and characteristics of good algorithm. (7,6)
- II. a) Write an algorithm to find the product of two matrix.
b) What is a stack? How stacks are used in implementing recursion. Explain. (6,7)

UNIT – II

- III. a) What are linked lists? Explain memory representation of two way headed linked list.
b) Write an algorithm to search and delete an element from the linked list? (6,7)
- IV. a) What are queues? How insertion and deletion can be done on queues. .
b) Write an algorithm to implement various operations on circular queues. (6,7)

UNIT – III

- V. a) Explain the concept of Binary Search Tree. How it can be stored in the memory?
b) Write an algorithm to insert an element in Binary Search Tree. (7,6)
- VI. a) Define Graphs? How graphs can be represented using arrays.
b) Explain breadth first search algorithm. Also explain its applications. (6,7)

UNIT – IV

- VII. a) Write the algorithm for Binary Search. What are the prerequisites of implementing Binary Search? How is it more efficient than linear search?
b) Draw a comparison between Insertion Sort and Selection Sort. (7,6)

P.T.O.

(2)

- VIII. a) Explain merge sort technique to sort the following element. Also explain its complexity
3 7 2 -8 6 3 11 9
- b) Write the steps to find an element using linear search. (7,6)

UNIT – V

- IX. Write a short note on the following:-
- a) Big O Notation (2)
 - b) Row major order of representing 2D array (2)
 - c) Recursion (1)
 - d) Two applications of linked lists (2)
 - e) In-Order Traversal of Binary Search Tree (2)
 - f) Adjacency Matrix (2)
 - g) Limitations of an array (2)

x-x-x