

December 2021
Bachelor of Computer Applications (BCA) Examination

Third Semester
BCA-302 : DATA STRUCTURE USING C

Time 3 Hours]

[Max. Marks 50
[Min. Marks 17

Note : Attempt any two sub-parts of a question. All questions carry equal marks.

1.

(a) What is Data Structure ? Explain classification of Data Structure.

(b) What is Linked List ? Write an algorithm to insert an element at the end of Singly Linked List.

(c) Write short note on the following :
(i) Abstract Data Type.
(ii) Sparse Matrix.
2.

(a) What are the problems with Linear Queue ? How it is solved by Circular Queue ? Explain.

(b) Explain Linked Implementation of Stack.

(c) Convert following Infix expression to Postfix expression :
(i) $(A + B) / (D \times E / F)$
(ii) $(X / Y - Z) * (W + V) / V$
3.

(a) What is meant by Binary Search Tree ? Write an algorithm to delete a node from a binary search tree. Include all possibilities.

(b) What do you understand by Threaded Binary Tree ? Explain one way and two way threading of a binary tree traversed in inorder. Write inorder traversal algorithm for threaded binary tree.

(c) Create a binary expression tree for the following expression and write its pre order and post order traversal :
 $((A + ((B + D) - E)) * (F * (G + H)))$
4.

(a) What is Binary Searching ? Describe the following searching algorithm and find its efficiency
(i) Interpolation Search.
(ii) Linear Search.

(b) What is Sorting ? Discuss Bubble Sort with an example. Also write algorithm and complexity of Bubble Sort.

(c) Explain the Indexed Sequential Search by giving suitable example.
5.

(a) Describe Depth First Search and Breadth First Search Method of traversing a graph.

(b) Write down the advantages and disadvantages of Chaining over Open Addressing.

(c) What do you understand by Hashing ? Describe any four hashing functions with suitable example.