

January 2019
Bachelor of Computer Application (BCA) Examination
IIIrd Semester
DATA STRUCTURE USING C++

Time 3 Hours]

[Max. Marks 50

Note : (1) Attempt all five questions. Solve any two parts from each question. All questions carry equal marks.

(2) Write algorithm or C++ routine for convenience.

1. (a) Draw a linked and array representation of the sparse Matrix of the following matrix :

$$\begin{bmatrix} 0 & 12 & 0 & 0 \\ 0 & 11 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 8 \end{bmatrix}$$

(b) What do you mean by Dynamic Memory Management.

(c) Categories of data structure. How pointers play role in data structure implementation ?

2. (a) Write a recursive function to calculate factorial of a number.

(b) Define multiple stacks. How can you exchange the value of two stacks ?

(c) Write a C function to convert an infix expression into postfix expression.

3. (a) Write an algorithm to create a queue using dynamic allocation. Also write necessary functions.

(b) Discuss the use of linked list in dynamic storage management.

(c) Write short notes on the following :

(i) Dynamic Storage Management.

(ii) D-Queue.

(iii) Doubly Linked List.

4. (a) Write an algorithm for insertion and deletion of elements from doubly linked list.

(b) Explain the list traversal in circular list. Write an algorithm of it.

(c) Provide an implementation of singly link list.

5. (a) Define the Balanced Tree. Explain by giving example how insertion and deletion takes place in a balance tree. <http://www.davvonline.com>

(b) What do you mean by Hash function ? Define methods of collision handling with example.

(c) Define the following terms related to tree : (with example)

(i) Siblings

(ii) Degree of a Tree

(iii) Leaf

(iv) Depth of a Tree.

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