

Roll No.

BCA–06

Data Structure Through C Language

Bachelor of Computer Application

(BCA-11/16/17)

Second Semester, Examination, 2018

Time : 3 Hours

Max. Marks : 80

Note : This paper is of **eighty (80)** marks containing **three (03)** Sections A, B, and C. Learners are required to attempt the questions contained in these Sections according to the detailed instructions given therein.

Section–A

(Long Answer Type Questions)

Note : Section ‘A’ contains four (04) long answer type questions of nineteen (19) marks each. Learners are required to answer *two* (02) questions only.

1. Implement typical stack operation when stacks are represented using (i) arrays and (ii) using singly linked lists.
2. (a) Define two-dimensional array with example.
(b) Explain time-space complexity.
3. (a) Sort the following data using insertion sort method :

30, 40, 10, 50, 70, 15, 45

(B-61) P. T. O.

- (b) Consider the following set of numbers sort them using quick sort method.

Clearly indicate the pivot element and partition at each step :

22, 45, 62, 34, 51, 24, 14, 53, 09

4. (a) Give infix expression for the following prefix string :

$\$ + A * BC * + ABC.$

- (b) With the output of the following program segment, show content of stack after every push and pop operation. Make necessary assumptions :

Initstack(s);

Push(S,10);

Push(S, 6);

I=pop(S);

While(i>=0)

{

Push(S,i*10);

i--;

}

Push(S,i*10);

While(!stackempty(S))

Printf(“%d”, pop(S));

Section-B**(Short Answer Type Questions)**

Note : Section 'B' contains eight (08) short answer type questions of eight (08) marks each. Learners are required to answer *four* (04) questions only.

1. Define Queue. List various applications of Queue.
2. Explain any *two* tree traversal methods.
3. Which data structure is used in Depth First Search ?
4. Write a program to insert a node into singly linked list.
5. Write a C program for Tower of Hanoi problem.
6. Define stack. List and define various operations that can be performed on stack.
7. Write a function for deleting *n*th element from singly circular linked list.
8. Explain bubble sort with the help of example.

Section-C**(Objective Type Questions)**

Note : Section 'C' contains ten (10) objective type questions of one (1) mark each. All the questions of this Section are compulsory.

1. The data structure required for Breadth First Traversal on a graph is :
 - (a) queue
 - (b) stack
 - (c) array
 - (d) tree

2. Let the following circular queue can accommodate maximum six elements with the following data :
front = 2 rear = 4 queue = ; L, M, N,,
What will happen after ADD O operation takes place ?
- (a) front = 2 rear = 5 queue =; L, M, N, O,
 - (b) front = 3 rear = 5 queue = L, M, N, O,
 - (c) front = 3 rear = 4 queue =; L, M, N, O,
 - (d) front = 2 rear = 4 queue = L, M, N, O,
3. Which of the following can a Dynamic Link Library contain ?
- (a) Only Code
 - (b) Code and Data only
 - (c) Code and Resources only
 - (d) Code, Data and Resources
4. In a circular linked list :
- (a) components are all linked together in some sequential manner.
 - (b) there is no beginning and no end.
 - (c) components are arranged hierarchically.
 - (d) forward and backward traversal within the list is permitted.

5. Which of the following data structure is linear data structure ?
- (a) Trees
 - (b) Graphs
 - (c) Arrays
 - (d) None of the above
6. When new data are to be inserted into a data structure, but there is no available space; this situation is usually called :
- (a) Houseful
 - (b) Saturated
 - (c) Underflow
 - (d) Overflow
7. How is data in a queue accessed ?
- (a) First-in First-out
 - (b) First-in Last-out
 - (c) Last-in First-out
 - (d) None of these
8. A linear list of elements in which deletion can be done from one end (front) and insertion can take place only at the other end (rear) is known as a :
- (a) queue
 - (b) stack
 - (c) tree
 - (d) linked list

9. If a node in a BST has two children, then its inorder predecessor has :
- (a) no left child
 - (b) no right child
 - (c) two children
 - (d) no child
10. The number of different directed trees with 3 nodes are :
- (a) 2
 - (b) 4
 - (c) 3
 - (d) 5