

BCA-06**Data Structure through C Language**

Bachelor of Computer Application

(BCA-11/16/17)

Second Year, 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. (a) Implement stack operation when stacks are represent using arrays.
(b) What is the purpose of stack in implementing a recursive procedure ? Explain.
2. (a) Write a linear search algorithm.
(b) Write a program/algorithm for queue operation.
3. (a) Give a tree T, find inorder and postorder traversals.
(b) Write an algorithm of Heap sort.

4. (a) How will you search element in B-Tree ? Explain.
- (b) Write algorithm to count the nodes in a given singly link list.

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. Write an algorithm to calculate elements in singly link list of integers.
2. Write an algorithm to reverse a string using stack.
3. Write an algorithm to find maximum element from Binary search tree.
4. Sort the following data using Quick sort.
5. Convert the following infix expression to postfix expression :

$$P - Q^R + S * T - U$$

6. Write an algorithm for BFS traversal of a graph.
7. Define linked list. Write the algorithm to create a linked list.
8. Write a short note on space and time complexity.

Section–C

(Objective Type Questions)

Note : Section ‘C’ contains ten (10) objective type questions of one (01) mark each. All the questions of this Section are compulsory.

1. Pushing an element into stack having six elements and stack size of 6, then stack becomes :
 - (a) overflow

- (b) crash
 - (c) underflow
 - (d) useflow
2. In a stack, if a user tries to remove an element from empty stack it is called :
- (a) underflow
 - (b) empty collection
 - (c) overflow
 - (d) garbage collection
3. “Entries in a stack are ordered.” What is the meaning of this statement ?
- (a) A collection of stacks are sortable
 - (b) Stack entries may be compared with ‘<’ operation
 - (c) The entries are stored in a link list
 - (d) There is a sequential entry that is one by one
4. A linear list of elements in which deletion can be done from one end (front) and insertion can take place only the other end (rear) is known as :
- (a) queue
 - (b) stack
 - (c) tree
 - (d) linked list
5. The data structure required for Breadth list traversal on a graph is :
- (a) Stack
 - (b) Array
 - (c) Queue
 - (d) Tree

6. What is the time complexity of inserting at the end in dynamic array ?
 - (a) $O(1)$
 - (b) $O(n)$
 - (c) $O(\log n)$
 - (d) Either $O(1)$ or $O(n)$
7. Which data structure can be used suitably to solve the Tower of Hanoi problem ?
 - (a) Tree
 - (b) Heap
 - (c) Priority queue
 - (d) Stack
8. What is speciality about inorder traversal of binary search tree ?
 - (a) It traverses in a non-increasing order
 - (b) It traverses in an increasing order
 - (c) It traverses in a random order
 - (d) None of the above
9. In the following scenarion, when will you use selection sort ?
 - (a) The input is already sort
 - (b) A large file has to be sorted
 - (c) Large value need to the sorted with small key
 - (d) Small value need to the sorted with large key
10. Linked list is a :
 - (a) Linear data structure
 - (b) Non-linear data structure
 - (c) Advanced data structure
 - (d) None of the above