

BCA-06

Data Structure through C Language

Bachelor of Computer Applications

(BCA-11/16/17)

Second Semester, Examination, 2017

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 any *two* (02) questions only.

1. (a) Write a function to two primitive operations on stack using dynamic memory allocation.
(b) Define linked list. Write the algorithm to add and delete element in Linked List.
2. (a) Write algorithm to convert the following infix to postfix expression :
$$(a * b) + c/d$$

(b) Write a function to traverse the tree using inorder and postorder traversal.

3. (a) Define ADT of binary search tree.
(b) Write the iterative search function and recursive search function of BST.
4. (a) Write a program to insert and delete element in Binary Search Tree.
(b) Define priority queue and priority heap.

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 any *four* (04) questions only.

1. Write recursive function to implement binary search.
2. Define 'Big Oh' notation. Show that $3n + 2 = o(n)$.
3. Define stack. Write the function of Push & Pop.
4. Write a function to evaluate postfix expression.
5. Explain the difference between Graph & Tree.
6. Construct the b-tree using the following element :
ABDCEF
7. What is Fibonacci heap ? Explain.
8. Write a program of bubble sort.

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. Process of inserting an element in stack is called :
(a) create

- (b) push
 - (c) evaluation
 - (d) pop
2. Process of removing an element from stack is called :
- (a) create
 - (b) push
 - (c) evaluation
 - (d) pop
3. Pushing an element into stack already having five elements and stack size of 5, then stack become :
- (a) over flow
 - (b) crash
 - (c) under flow
 - (d) user flow
4. A queue is a :
- (a) FIFO (first in first out) list
 - (b) LIFO (last in first out) list
 - (c) Ordered list
 - (d) Linear tree
5. In Breadth First Search of Graph, which of the following data structures is used ?
- (a) stack
 - (b) queue
 - (c) linked list
 - (d) None of the above

6. Which of the following is not disadvantage of the usage of array ?
 - (a) Fixed size
 - (b) You know the size of the array prior to allocate
 - (c) Insertion based positive
 - (d) Accessing element at specified position
7. Which among the following is not palindrome ?
 - (a) Madam
 - (b) Dad
 - (c) Malayalam
 - (d) Maadam
8. Which of the following is false about binary search tree ?
 - (a) the left child is always lesser than its parent
 - (b) the right child is always greater then its parent
 - (c) the left and right sub tree show also be a binary search tree
 - (d) None of the above
9. What is an in place sorting algorithm ?
 - (a) It need $O(1)$ or $O(\log n)$ memory to create auxilary location
 - (b) The input is already sorted and in place
 - (c) It requires additional storage
 - (d) None of the above
10. Tree is a :
 - (a) Linear data structure
 - (b) Non-linear data structure
 - (c) Circular data structure
 - (d) None of the above