

No. of Printed Pages : 05

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 1106	Roll																			
	No.																			

BCA Examination 2018-19

(Even Semester)

DATA STRUCTURE USING 'C'

Time : Three Hours]

[Maximum Marks : 100

Note :- Attempt all questions.

SECTION – A

1. Fill in the blanks : 10×1=10
- (a) Function is used to dynamically allocate memory.
 - (b) Function that look at a linked list but do not modify it are referred to as
 - (c) The nodes of a free contain five link members.

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- (d) Each link in a free node points to a or of that node.
- (e) A data structure is a logical method of representing
- (f) refers to the amount of storage the algorithm consumes.
- (g) In traversal the root node is visited last.
- (h) Arrays are the structure of data items.
- (i) The basic operations in stack are
- (j) Procedure that calls itself is called
2. State whether True or False : $10 \times 1 = 10$
- (a) A program can always be terminated.
- (b) The complexities are added for nested loops.
- (c) In a preorder traversal the root node is visited first.
- (d) All nodes in a list point to some other node.

- (e) A stack is a data structure in which insertions and deletions are restricted to one end.
- (f) In a binary tree, a node may have a degree greater than 2.
- (g) Function free () reallocates memory.
- (h) Linked list nodes are normally stored contiguously in memory.
- (i) Queue nodes are removed only from the front.
- (j) A node with no children is called a leaf node.

SECTION – B

3. Attempt any three parts of the following : $3 \times 10 = 30$
- (a) Compare arrays and lists. State where they stand in context of speed, space, reliability, insertion, deletion and access operation.
- (b) Write the implementation of a queue. What do you mean by priority queue? Explain the difference.
- (c) What is a Binary Search Tree? How is it different from a binary tree? Write an algorithm for the preorder traversal of a tree.

- (d) What is a Linked List? Describe the code for inserting a node in a single linked list.
- (e) Show the step-by-step procedure to sort the following elements using insertion sort :
53, 25, 47, 17, 63, 6, 49, 99, 13, 67

SECTION – C

Note :- Attempt all questions. $5 \times 10 = 50$

4. Attempt any one part of the following :
- (a) Write a 'C' program for matrix multiplication.
- (b) Write a 'C' program for inserting an element in an array.
5. Attempt any one part of the following :
- (a) Write algorithm to convert a postfix expression into an infix expression. Consider the following arithmetic expression in postfix notation and convert it into the infix form :
 $8\ 9\ 5\ +\ * \ 3\ 6\ 1\ -\ / \ -$
- (b) Write a program in 'C' to find out duplicate elements in the queue.

6. Attempt any one part of the following :
- (a) Write a 'C' program that creates a new linear linked list by selecting alternate elements of a given linear linked list.
- (b) Write a 'C' program for insertion and deletion in a circular doubly linked list.
7. Attempt any one part of the following :
- (a) Write the step by step procedure for creating a binary search tree by using the following elements :
35, 9, 6, 25, 63, 45, 3, 17, 88, 39
- (b) Describe binary tree along with its representation. How will you search an element in a binary tree? Explain with example.
8. Attempt any one part of the following :
- (a) Write and explain a 'C' program for bubble sort.
- (b) Compare and contrast binary search and linear search. Write a step-by-step procedure to search element 25 in the following list using binary search :
3, 10, 19, 25, 47, 65, 73, 85, 94, 99