NBF-003-003205 Seat No. _____

B. C. A. (Sem. II) (CBCS) Examination
April/May - 2017
CS-07 : Data Structure using C Language
(Old Course)

Faculty Code : 003
Subject Code : 003205

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 Fill in the following blanks : **20**

(1) Two main measures of the efficiency of an algorithm are _____.

(2) The memory address of the first element of an array is called _____

(3) Quick sort uses _____ for implementation.

(4) _____ form of access is used to add and remove nodes from a stack.

(5) The result of evaluating prefix expression *b+-dacd, where a=3, b=6, c=1, d=5 is

(6) Each entry in a linked list is called a _____

(7) The situation when in a linked list START=NULL is _____.

(8) A data structure where elements can be added or removed at either end but in the middle is _____.

(9) The _____ of a node is the number of edges containing that node.

(10) In a Graph, if an edge has identical end points, it is called a _____.

(11) The complexity of Bubble sort algorithm is _____.

(12) The function used to deallocate memory is _____.

(13) The worst-case time for merge sort to sort an array of n element is _____.

(14) New nodes are added to the _____ of the queue.

(15) If the characters 'D', 'B', 'C', 'A' are placed in a queue, and then removed one at a time, in _____ order they will be removed.

(16) There is no any NULL links in _____ linked list.

(17) In an array representation of binary tree the right child of root will be at location of _____.

(18) In tree construction, _____ is the suitable efficient data structure.

(19) A graph is said to be _____ if there is a path between any two of its nodes.

(20) _____ is a common method used to store a graph.

2 (a) Attempt the followings : (Any 3 out of 6) **6**

(1) Explain the meaning of worst case analysis in short.

(2) What is chain pointer?

(3) What is sorting? List out type of sorting.

(4) Differentiate: Stack v/s Queue

(5) Give real life example of queue.

(6) List different types of linear and non-linear data structure,

(b) Attempt the followings : (Any 3 out of 6) **9**

(1) Define and Explain Big Omega notation.

(2) What is structure? Explain it with suitable example.

(3) What do you mean by pass by reference / address? Differentiate: pass by value ***V/s.*** pass by reference

(4) What is an array? Differentiate : one dimensional array v/s two dimensional array.

(5) Write an algorithm for selection sort.

(6) Explain Polish notation with suitable example.

(c) Attempt the followings : (Any 2 out of 5) **10**

(1) Define complexity of an algorithm. What is meant by time-space trade off ?

(2) What is searching? Write a program to implement binary search.

(3) Implement stack with the following functions : Push( ), Pop( ), Peep( ), Change( )

(4) What do you mean by circular queue? Explain advantages of it over simple queue.

(5) Write a menu driven singly linked list program in C which performs the entire linked list operations.

(6) Given a sequence of numbers :
11, 6, 8, 19, 4, 10, 5, 17, 43, 49, 31
Draw a binary search tree by inserting the above numbers from left to right.

3 (a) Attempt the followings : (Any 3 out of 6) **6**

(1) Write the concept of link list.

(2) Differentiate: Singly Linked List v/s Doubly Linked List

(3) Differentiate: Array v/s Link List

(4) What is binary tree? Explain in short.

(5) Explain Spanning tree in short.

(6) List the primitive data types in C language.

(b) Attempt the followings : (Any 3 out of 6) **9**

(1) Write an algorithm for header link list.

(2) State advantages of linked list over array.

(3) Write an algorithm of post-order traversing of binary tree.

(4) Explain Depth First Search of traversing.

(5) Explain recursion with suitable example in stack.

(6) What is pointer? Explain it with suitable example.

(c) Attempt the followings : (Any 2 out of 5) **10**

(1) Write a menu driven program for doubly linked list which create node, add after specified position, count number of node, delete first node, delete last node and sort (ascending) order the node from the list.

(2) Write a program to create and display circular singly link list.

(3) Write a C program to create and traverse (in-order) binary tree.

(4) Explain all iterations of bubble sort with example.

(5) Consider the given Binary Search Tree :

Write the Pre-order, In-order and Post-order traversal for the tree.