DBW-003-1032001 Seat No. _____

B. C. A. (Sem. II) (CBCS) (W.E.F. 2016) Examination

July - 2022

CS-07 : Data Structure Using C Language

Faculty Code : 003
Subject Code : 1032001

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

1 (a) Attempt the following : **04**

(1) A function used to de-allocate memory is ____.

(2) The amount of memory required to run, and completion of an algorithm or program is known as ____ complexity.

(3) _____ keyword is used for structure data type.

(4) Data structure which does not store the data sequentially is called ___.

(b) Answer in brief (Any One) **02**

(1) Define pointer. Explain how pointer is declared with example.

(2) Differentiate : Structure Vs. Union

(c) Answer in detail (Any One) **03**

(1) Explain the storage classes : auto, extern and static.

(2) Write a note on dangling pointer problem.

(d) Write a note on Any One **05**

(1) Write a C program to swap values using pointer without using function.

(2) Write a C program which demonstrates the use of call by value & call by reference.

2 (a) Attempt the following : **04**

(1) Full form of BFS is _____.

(2) _____ sorting technique is also known as Bin Sort.

(3) _____ sort uses recursion for implementation.

(4) In a Graph, the number of edges incident onto the vertex is known as the ____ of the vertex.

(b) Answer in brief on Any One **02**

(1) Explain Shortest Path problem.

(2) Differentiate : DFS Vs. BFS

(c) Answer in detail (Any One) **03**

(1) Explain Bucket sort.

(2) Write a program so sort an array element using bubble sort technique.

(d) Write a note on Any One : **05**

(1) What is sorting ? Explain selection sort with example.

(2) What is searching ? Explain linear search with example.

3 (a) Attempt the following : **04**

(1) Stack is ____ kind of data structure.

(2) Queue follows ____ method.

(3) If top = –1, then the stack is ____.

(4) In queue elements are inserted from ____ end.

(b) Answer in brief (Any One) **02**

(1) What is Priority queue ?

(2) Write two differences of homogeneous and non-homogeneous data types.

(c) Answer in detail (Any One) **03**

(1) Convert the infix notation : A + [B-C)*D] / E into postfix notation.

(2) Write algorithm for push and pop for stack.

(d) Write a note on Any One : **05**

(1) Define data structure. List and explain primitive and non-primitive data structures.

(2) Write an algorithm to perform push, pop() and display () operations on stack.

4 (a) Attempt the following: **04**

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

(2) In a singly linked list if link part of first node is NULL, the list contains ____node.

(3) A doubly linked list provides list traversal in ____ direction.

(4) ____ linked list cannot store the NULL value in the list.

(b) Answer in brief (Any One) **02**

(1) State the advantages of linked list over array.

(2) Write down applications of the linked list.

(c) Answer in detail (Any One **03**

(1) Explain circular linked list with example.

(2) Write an algorithm to insert new node in the beginning of the singly linked list.

(d) Write a note on (Any One) **05**

(1) Write a C function : Doubly linked list operation - delete a node from a specified location.

(2) Write a C function : Singly linked list operation - insert a node at a specified location.

5 (a) Attempt the following : **04**

(1) The nodes with no successor are called _____.

(2) ____ type of traversal of binary search tree outputs the value in sorted order.

(3) In tree, ____node has no children.

(4) The maximum possible number of nodes in a binary tree at level 6 are _____.

(b) Answer in brief (Any One) **02**

(1) Define root node, leaf node, parent node and child node.

(2) Write properties of binary tree.

(c) Answer in detail (Any One) **03**

(1) Explain the basic terminologies of a binary tree.

(2) Write a note on post order traversal of binary tree.

(d) Write a note on Any One **05**

(1) Construct a binary tree for the following elements :

45, 15, 79, 90, 10, 55, 12, 20, 50

Also write the in-order, pre-order and post-order traversal of the binary tree.

(2) Explain traversal of Binary Tree.
