



**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.
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