S-86 Roll No. ……..

MCA–06/PGDCA–06/M.Sc. (IT)–06

Data Structure Through C Language

Master of Computer Applications/P. G. Diploma in Computer Applications/Master of Science in Information Technology
(MCA/PGDCA/MSc.IT-11/12/16/17)

Second Semester, Examination, 2018

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 *two* (02) questions only.

1. Explain different types of sorting methods. Explain them with programming example.
2. Explain the working of a stack. Write a C program to show the all operations on a Stack. Also write the applications of Stack in Computer devices.
3. (a) Write a 'C' program to create a link list of 10 elements.
   (b) Explain queue and its operations.

4. Write short notes on the following :
   (a) Graph
   (b) Regree of vertex
   (c) Weighted graph
   (d) Path

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 *four* (04) questions only.

1. Describe the use of Array and Structures.
2. Write an algorithm for the implementation of Selection Sort.
3. State the different approaches to design double link list.
4. Write a C program to implement bubble sort.
5. What are POLISH Notation ? Show with examples.
6. Write the Push and POP functions in C simulating Push and Pop operations of STACK implemented using an array of integers.
7. Write a C program to perform Binary search on 10 elements.
8. Write an algorithm for insertion of a new node into the lost position in a circular linked list.

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.

Answer the following questions :

1. Two main measures for the efficiency of an algorithm are :
   (a) Processor and memory

(b) Complexity and capacity

(c) Time and space

(d) Data and space

2. The time factor when determining the efficiency of algorithm is measured by :

(a) Counting microseconds

(b) Counting the number of key operations

(c) Counting the number of statements

(d) Counting the kilobytes of algorithm

3. The space factor when determining the efficiency of algorithm is measured by :

(a) Counting the maximum memory needed by the algorithm

(b) Counting the minimum memory needed by the algorithm

(c) Counting the average memory needed by the algorithm

(d) Counting the maximum disk space needed by the algorithm

4. Which of the following cases does not exist in complexity theory ?

(a) Best case

(b) Worst case

(c) Average case

(d) Null case

5. Full form of ADT is :

(a) Advanced data type

(b) Array data type

(c) Abstract data type

(d) None

6. The complexity of the average case of an algorithm is :
   (a) Much more complicated to analyze than that of worst case
   (b) Much simpler to analyze than that of worst case
   (c) Sometimes more complicated and some other times simpler than that of worst case
   (d) None of the above
7. Which of the following data structure is not linear data structure ?
   (a) Arrays
   (b) Linked lists
   (c) Both of the above
   (d) None of the above
8. Which of the following data structure is linear data structure ?
   (a) Trees
   (b) Graphs
   (c) Arrays
   (d) None of above
9. Which of the following is based on first in first out ?
   (a) String
   (b) Lists
   (c) Stacks
   (d) None of above
10. Which of the following is a sequential data structure ?
   (a) Strings
   (b) Lists
   (c) Queues
   (d) All of the above