# [R15103]

## **M.C.A. DEGREE EXAMINATIONS**

## FIRST SEMESTER

## Paper - III: C PROGRAMMING AND DATA STRUCTURES

## (W.E.F. 2020-21 Admitted Batch)

Time : 3 Hours

#### Maximum Marks: 75

#### **SECTION-A**

#### Answer All questions. Each questions carries 15 marks. (4×15=60)

- 1. a) Explain basic data type and their sizes.
  - b) Write briefly about the nested for loop statement. Write a program to generate Multiplication table.

#### (OR)

- c) Explain arithmetic, relational, bitwise and logical operators available in C language.
- d) A cloth showroom has announced the following seasonal discount on purchase of items: Write a program using switch and if statements to compute the net amount to be paid by a Customer.

| Purchase  | Discount   |          |
|-----------|------------|----------|
| amount    | Mill cloth | Handloom |
|           |            | items    |
| 0-100     |            | 5%       |
| 101-200   | 5%         | 7.5%     |
| 201-300   | 7.5%       | 10.0%    |
| Above 300 | 10.0%      | 15.0%    |

- 2. a) Explain accessing and storing of elements in one and two dimensional arrays.
  - b) Write a C program to swapping of two numbers using call by- value and Call by-Reference.

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(**OR**)

- c) What is mean by function argument, function call and return value? Explain with suitable Program.
- d) What is a pointer? Explain reasons for using pointer.
- **3.** a) What are the similarities between a Structures and Union? Explain with example.
  - b) Write a C language program to copy the contents of one file to another file.

#### (OR)

- c) Explain the operations of queue with suitable algorithms and examples.
- d) Write an algorithm for converting infix expression to postfix expression with example.
- **4.** a) Write an algorithm to insert new node at the beginning and at the end of a singly linked List.
  - b) Generate a binary search tree for following numbers and perform in-order and postorder Traversals: 50, 40, 80, 20, 0, 30, 10, 90, 60, 70.

#### (OR)

- c) Apply quicksort algorithm to sort the data: 42, 29, 74, 11, 65, and 58. Justify the steps.
- d) Explain Depth First Search and Breadth First Search algorithms in detail.

### **SECTION - B**

 $(5 \times 3 = 15)$ 

#### 5. Answer any FIVE questions.

- a) Differentiate break and continue.
- b) How to declare character constant and string constants?
- c) Define actual and formal parameter.
- d) Describe storage allocation and scope of global, extern and static variables.
- e) What is bit-field? Give its uses.
- f) What are the advantages of using a linked list rather than array?
- g) Write about Sequential search method.
- h) How to insert an element in circular queue?

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