# GIET UNIVERSITY, GUNUPUR – 765022

## M.C.A (First Semester) Examinations, March – 2023

## MCA20101 - Problem Solving and Data Structures

Time: 3 hrs                                                      Maximum: 70 Marks

**(The figures in the right hand margin indicate marks.)**

### PART – A                                                      (2 x 10 = 20 Marks)

| Q.1. Answer all questions | CO# | Blooms Level |
|---|---|---|
| a. C is a structured programming language? Justify. | CO1 | K1 |
| b. Differentiate between Continue and Break statement | CO1 | K1 |
| c. Write a 'C' program to find the largest among two numbers using Conditional Operator. | CO1 | K1 |
| d. What is type casting? What are its types? Explain it with an example. | CO1 | K2 |
| e. Differentiate between call by value and call by reference. | CO1 | K2 |
| f. What is an array variable? How it is different from ordinary variable? | CO2 | K2 |
| g. Give an example of structure inside another structure. | CO2 | K2 |
| h. State the difference between array and linked list. | CO3 | K2 |
| i. What is abstract data type? Explain. | CO3 | K1 |
| j. What will be the output of the following program? Justify your answer. | CO2 | K3 |

```
float *fp;
*fp=2.134;
printf("%f\n",*fp);
```

### PART – B                                                      (10 x 5 = 50 Marks)

Answer ***ANY FIVE*** questions

| | | Marks | CO# | Blooms Level |
|---|---|---|---|---|
| 2. a. | Write a C program to enter a number and check whether it is a palindrome or not. | 5 | CO1 | K3 |
| b. | What is operator in C? Explain different types of operators in C. | 5 | CO1 | K1 |
| 3. a. | Write down the difference between entry controlled loop and exit controlled loop. | 5 | CO1 | K1 |
| b. | Write a C Program to check whether a number is a prime number or not (using UDF). | 5 | CO1 | K3 |
| 4. a. | Write a C program to multiply two matrices of any order. | 5 | CO2 | K2 |
| b. | What do you mean by dynamic allocation of memory? Explain with example. | 5 | CO2 | K2 |
| 5. a. | Write a C program to enter details (name, emp_id, salary) of all the employees of a company and print the details of the employee having maximum salary. | 5 | CO2 | K3 |
| b. | What do you mean by pointer? Write a C program to concatenate two strings using pointer. | 5 | CO2 | K2 |
| 6. a. | What do you mean by asymptotic notations? Explain different types of notations used to measure the complexities of an algorithm. | 5 | CO3 | K1 |
| b. | Write algorithms to insert a new node at the beginning and end of a single linked list. | 5 | CO3 | K3 |
| 7. a. | What do you mean by queue? How a queue can be represented in memory? Write algorithms to insert and delete data in a circular queue. | 5 | CO3 | K1 |
| b. | Write an algorithm to translate an expression from infix to postfix? Convert the following expression to postfix expression using the algorithm. K + L - M*N + (O^P) * W/U/V * T + Q | 5 | CO3 | K2 |
| 8. a. | What do you mean by sparse matrix? How it can be represented in memory. | 5 | CO3 | K1 |
| b. | What do you mean by recursion? Write a C program to find the factorial of a number using recursion. | 5 | CO1 | K2 |

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