MCS–011

MASTER OF COMPUTER

APPLICATIONS (REVISED) (MCA)

Term-End Examination

December, 2023

MCS–011 : PROBLEM SOLVING AND

PROGRAMMING

Time : 3 Hours   *Maximum Marks : 100*

Note : *Question No. **1** is compulsory. Answer any **three** questions from the rest.*

1. (a) Write an algorithm and draw a corresponding flow chart to check whether the number is prime or not.   10

   (b) Write a program in C to find the sum of digits of a 5-digit number.   6

P. T. O.

(c) Write a C program to generate the following pattern : 8

           1

           2 2

           3 3 3

           4 4 4 4

           5 5 5 5 5

(d) Write a C function to find the square of an integer. 5

Note : Do not use inbuilt functions.

(e) Explain the use of pointers and its characteristics. 5

(f) Describe the conditional statements "Multiple-if" and "nested-if" with *one* example for each. 6

2. (a) Explain the type of errors in C program by giving an example for each. 6

(b) Write an interactive C program to calculate the salary of an employee based on Basic-pay, TA, DA, Grade pay and other allowances. Use structures. 8

(c) What is an operator ? List and explain various categories of operators in C. 6

3. (a) Explain the following variables with an example for each : 10

   (i) Automatic

   (ii) Extern

   (iii) Static

   (iv) Register

   (b) Write a program in C to award grade to the students depending on the marks : 10

   If mark > 75 then grade – 'A'

   60–75 then grade 'B'

   50–60 then grade 'C'

   40–50 then grade 'D'

   < 40 then grade 'E'

4. (a) Check a string for palindrome using library functions. 5

   (b) Describe file handling in C. Explain various functions like fopen (), fclose () and fseek (). 10

(c) Define an array. How are arrays declared and initialised ? Write a C code segment to explain it.   5

5. Differentiate the following :   5×4=20

(i)   Function *vs*. Macro

(ii) Structure *vs*. Union

(iii) Call by value *vs*. Call by reference

(iv) Break statement *vs*. Continue statement