PG/IS/MTM/104/24

M.Sc. 1st Semester Examination, 2024

APPLIED MATHEMATICS

(*Advanced Programming in C and MATLAB*)

PAPER – MTM-104

Full Marks : 50

Time : 2 hours

Answer **all** questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

GROUP – A

1. Answer any *four* questions in MATLAB : 2×4

(*i*) Create a matrix of *n* order whose elements are any random number between 0 and 1. Then display the sum of all elements row-

wise and column-wise. Then find the maximum and minimum in each row and column.

(*ii*) Write a function to find LCM of two positive integers.

(*iii*) Suppose you have an array of numbers including zeros. Write a program to find the inverse of all non-zero elements.

(*iv*) Explain relational operations.

(*v*) What is the difference between *disp*() and *fprintf* () functions ?

(*vi*) Write a program to find the inverse of a matrix.

GROUP – B

2. Answer any *four* questions in C language : 4×4

(*i*) Explain call by value and call by reference.

(*ii*) What is pointer variable ? Describe pointer arithmetic.

(*iii*) What is the difference between structure and union ? How structure variable is defined ?

(*iv*) What is enumeration ? Demonstrate it writing a program.

(*v*) What is macro ? Describe logical bitwise operations.

(*vi*) What is difference between i++ and ++i ? Explain switch statement.

GROUP – C

3. Answer any *two* questions in C language : 8×2

(*i*) (*a*) Write a program to find Ramanujan-Hardy numbers using the numbers

belonged to the interval [1, N] where N is any positive integer. 4

(b) Suppose, you have a string. Write a program to find the number of occurrence of a specified character in the string. 4

(ii) (a) Write a program to display the sum of n natural numbers with the help of a function to get the sum of n natural numbers not using any loop and any formula. 2

(b) Suppose you have a list of numbers not necessarily distinct. Now write a program to find the distinct numbers in the list. 6

(iii) (a) Write a program to display the content of a text file which is stored in your computer system. 5

(b) Write a program to find n! recursively. 3

(*iv*) (*a*) Write a program to find the average of n numbers using dynamic memory allocation. 5

(*b*) Write a program to multiply two complex numbers using structure. 3

[Internal Assessment – 10 Marks]