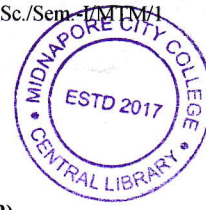


PG CBCS
M.SC. Semester-I Examination, 2022
DEPARTMENT OF MATHEMATICS
PAPER: MTM 104



(ADVANCED PROGRAMMING IN C AND MATLAB)

Full Marks: 40

Time: 2 Hours

The figures in the right-hand margin indicate full marks.
 Candidates are required to give their answers in their own words as far as practicable.

1. Answer any FOUR questions from the following: 4×2=08

- a) What is pre-processor?
- b) Explain the left and right division in MATLAB
- c) What function is used in MATLAB to find the product of two polynomials?
 Illustrate this using following two functions $2x^5 + 4x^3 + 7x^2 + 6x + 5$ and $3x^4 - 8x^3 - 5x + 7$.
- d) What is enumeration?
- e) What is self-referential structure?
- f) Explain different types of bitwise operators.

2. Answer any FOUR questions from the following: 4×4=16

- a) What is call by value & call by reference? Discuss with suitable example.
- b) Explain the relational and logical operations in MATLAB with examples.
- c) Explain the relational and logical operations in MATLAB with examples.
- d) The exponential power of x is approximately by the following infinite series

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$$
 Write a program in MATLAB to find out how many terms will be sufficient in the right-hand side of the given expression to ensure that the result is within the 5% error of the exact value.
- e) Write a program in MATLAB to find the prime numbers between two specified numbers.
- f) How are more than one element accessed from an array? Write a program to find the value of a determinant. 2+2

P.T.O.

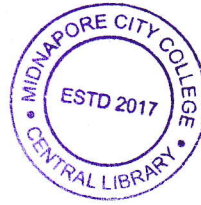
3. Answer any **TWO** questions from the following:

2×8=16

a) Write a short note on following:

4X2=8

- (i) fgetc()
- (ii) fputs()
- (iii) fprintf()
- (iv) malloc()



b) (i) Describe the types of variables in MATLAB according to their scopes in two or more functions.

(ii) What are 'nargin' and 'nargout' functions? To illustrate these, write a function to compute area of a square or volume of a cube depending on the number of input arguments. 4+4

c) (i) What are kind of information is represented by a pointer variable? What is relationship between the address of variable v and the corresponding pointer variable pv ?(ii) Write a program in C that will calculate the sum of every third integer, beginning with $i = 2$ for all values of i that are less than 100. Write the loop (1) using a *while* statement and (2) using a *for* statement. 3+5d) (i) Write a program in C that will generate a table of values for the equation $y = 2e^{-0.1t}\sin(0.5t)$ where t varies between 0 and 60. Allow the size of the t -increment to be entered as an input parameter.

(ii) In what way does an array differ from an ordinary variable. 5+3
