

## FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, MARCH 2020

(CUCSS)

Mathematics

MT 4E 12—COMPUTER ORIENTED NUMERICAL ANALYSIS

Time : One Hour and a Half

Maximum : 18 Weightage

## Part A

*Short answer questions (1-6).**Answer all questions.**Each question has 1 weightage.*

1. Write a Python program for displaying the following output : A Byte of Python.
2. Explain the uses of break statement.
3. Write a Python program for listing all numbers less than 50.
4. Give an algorithm for polynomial evaluation.
5. Write Gauss-Seidel iterative method for solving the system of linear equations

$$a_{11}x_1 + a_{12}x_2 + a_{13}x_3 = b_1$$

$$a_{21}x_1 + a_{22}x_2 + a_{23}x_3 = b_2$$

$$a_{31}x_1 + a_{32}x_2 + a_{33}x_3 = b_3.$$

6. Write an algorithm for finding the derivative of a continuous function.

(6 × 1 = 6 weightage)

## Part B

*Answer any four from the following six questions (7-12).**Each question has weightage 2.*

7. Write a Python program to demonstrate a function that convert weight in pounds to weight in kilograms.
8. Write a python program for finding the the average of given numbers.
9. Write a python program which uses if ... elif ... else statement.

Turn over

10. Write a Python program for finding the value of  $\sqrt{n}$ , where  $n$  is a positive integer.
11. Write Bairstow algorithm for finding the complex roots of a polynomial equation.
12. Write a Python program to evaluate  $\int_a^b f(x) dx$  using trapezoidal rule.

(4 × 2 = 8 weightage)

### Part C

Answer any **one** from the following two questions (13-14).

The question has weightage 4.

13. Write an algorithm and the corresponding Python program for finding a real root of an equation  $f(x) = 0$  by using bisection method.
14. Write a computer oriented algorithm and the corresponding Python program to solve the differential equation  $\frac{dy}{dx} = f(x, y)$ ,  $y(x_0) = y_0$  by using Range-Kutta method.

(1 × 4 = 4 weightage)