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B.Sc. (Part-III) Examination, 2020

MATHEMATICS

Paper - III

(Programming in 'C' and Numerical Analysis)

Time Allowed : Three Hours

Maximum Marks : 30

Minimum Pass Marks : 10

Note : Attempt all five questions. One question from each unit is compulsory. All questions carry equal marks.

Unit - I

Q. 1. What are control structures ? Explain with suitable example. **6**

Or

What is an Array ? Explain its various types.

Unit - II

Q. 2. Using bisection method find real root of $x^3 - x - 1 = 0$. **6**

Or

By means of Lagrange's formula prove that

$Y_1 = Y_3 - 0.3(Y_5 - Y_{-3}) + 0.2(Y_{-3} - Y_{-5})$ Approx.

Unit - III

Q. 3. Write a short note on Jacobi's method. **6**

Or

Discuss Gauss elimination method with suitable example.

Unit - IV

Q. 4. Use Euler's method to find : **6**

$Y(0.4)$ from the differential equation $\frac{dy}{dx} = xy,\ Y(0) = 1$

Take for each step h = 0.1.

Or

Use Runge-Kutta method to find y when x = 1.2 in steps of 0.1, given that :

$\frac{dy}{dx} = x^2 + y^2, y(1) = 1.5.$

Unit - V

Q. 5. Discuss error analysis for Monte Carlo Integration method with suitable example. **6**

Or

Elaborate hit or miss Monte Carlo Integration method with suitable example.