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B.Sc. (Part-III) Supplementary/Special Examination, 2021

MATHEMATICS

Paper - III

(Programming in 'C' and Numerical Analysis)

Time Allowed : Three Hours

Maximum Marks : 30

Minimum Pass Marks : 10

Note : Attempt one question from each unit. All questions carry equal marks.

Unit-I

Q. 1. What are logical operators ? Discuss any two with suitable example. **6**

OR

Write a short note on various data types of 'C' programming.

Unit-II

Q. 2. Find a real root of the equation $F(x) = x^3 - 2x - 5 = 0$, using bisection method in five stages. **6**

OR

Using Lagrange's interpolation formula, find the value of y for x = 9.5 from the following table :

x	:	7	8	9	10
$y = f(x)$	:	3	1	1	9

Unit-III

Q. 3. Find the inverse of : **6**

$$A = \begin{bmatrix} 0 & 2 & 4 \\ 2 & 4 & 6 \\ 6 & 2 & 2 \end{bmatrix}$$

by Gauss Elimination method.

OR

Discuss Jacobi's method with suitable example.

Unit-IV

Q. 4. Solve the equation $\frac{dy}{dx} = 1 - y$ given that y(0) = 0 using modified Euler's method and find the values of y at x = 0.1, 0.2, 0.3. Compare your results with the exact solution. **6**

OR

Solve $\frac{dy}{dx} = \frac{1}{x + y}$ for x = 0.5 by using Runge-Kutta method with $x_0 = 0$, $y_0 = 1$ (take h = 0.5).

Unit-V

Q. 5. Write a short note on Monte Carlo integration for improper intervals. **6**

OR

Write a short note on Monte Carlo Integration method.