Roll No.							

25-CS-23

M.Sc. II SEMESTER [MAIN/ATKT] EXAMINATION MAY - JUNE 2025

COMPUTER SCIENCE

Paper - III

[Computer Oriented Numerical and Statistical Method]

[Max. Marks : 75] *[Time : 3:00 Hrs.]* *[Min. Marks : 26]*

Note : Candidate should write his/her Roll Number at the prescribed space on the question paper.
Student should not write anything on question paper.
Attempt all five questions. Each question carries an internal choice.
Each question carries **15 marks.**

Q. 1 a) Explain the concept of significant digit and normalized floating point numbers. **(05 Marks)**

b) Find the root of the equation $x^3 - x^2 + x - 7 = 0$ using bisection method correct to three decimal places and perform five iterations. **(10 Marks)**

OR

a) Round of the number 865230 to four significance figures and compute the following types of error - **(05 Marks)**

i) Absolute error.

ii) Relative error.

iii) Percentage error.

b) Evaluate $\sqrt{5}$ to six decimal places by using Newton's Raphson method. **(10 Marks)**

Q. 2 a) Solve the system by Gauss elimination method - **(05 Marks)**

$2x + 3y - z = 5$

$4x + 4y - 3z = 3$

$2x - 3y + 2z = 2$

b) Solve the system of equation by Gauss Jorden method. **(10 Marks)**

$x + y + z + w = 2$

$2x - y + 2z - w = -5$

$3x - 2y + 3z - 4w = 7$

$x - 2y - 3z + 2w = 5$

P.T.O.

OR

a) What is ill condition ? Explain. **(05 Marks)**

b) Solve the system of equation by Jacobi's method. **(10 Marks)**

$4x + y + 3z = 17$

$x + 5y + z = 14$

$2x - y + 8z = 12$

Q. 3 a) Find the cubic polynomial which takes the following values - **(05 Marks)**

X	0	1	2	3
Y	1	2	1	10

b) The population of a country is as follows - **(10 Marks)**

Year	1921	1931	1941	1951	1961	1971
Population (in Crores)	20	24	29	36	46	51

Find the increase in population in the period of 1951 to 1961.

OR

a) Explain Inverse interpolation and double interpolation. **(05 Marks)**

b) Find the value of x = 8 by appropriate Newton's method from the following table - **(10 Marks)**

X	4	5	7	10	11	13
Y	48	100	294	900	1210	2028

Q. 4 Evaluate **(15 Marks)**

$$\int_0^6 \frac{1}{(1+x^2)}\, dx$$

Using - i) Trapezoidal rule. ii) Simpson's 1/3rd rule.

iii) Simpson's 3/8 rule.

OR

a) Find y(0.1) in step of 0.1 by applying Runge - Kutta R-K 2nd order method given that $\frac{dy}{dx} = y - x$ with y(0) = 2. **(05 Marks)**

b) Given that $\frac{dy}{dx} = xy$ and y = 5 when x = 1, find an approximate value of y(1.5) with step size 0.1, using Euler's method. **(10 Marks)**

Cont. . . .

Q. 5 Calculate the mean, median and mode of the following data - **(15 Marks)**

X	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
f(x)	7	12	20	35	51	80	60	35

OR

a) Calculate the co-efficient of correlation from the following given data - **(05 Marks)**

x	9	8	7	6	5	4	3	2	1
y	15	16	14	13	11	12	10	8	9

b) Calculate standard deviation from the following data - **(10 Marks)**

Age in Years :	10-20	20-30	30-40	40-50	50-60	60-70
No. of Person :	2	4	8	10	12	4

Calculate standard deviation from actual mean and assumed mean.