Seat No. : _____

NI-113

November-2025

B.Sc., Sem.-V

SEC-MAT : 356 : Mathematics

(Practicals on Marketing & Numerical Methods)

Time : 1:00 Hour] **[Max. Marks : 25**

Instructions : (1) **All** questions are compulsory.

(2) Write the question number in your answer book as shown in the question paper.

(3) The figure to the right indicates marks of the question.

1. (a) Convert Matrix C = $\begin{bmatrix} 1 & 2 & 9 & 0 & 1 & 3 \\ 4 & 0 & 8 & 3 & 0 & 5 \\ 5 & 6 & 7 & 1 & 4 & 0 \\ 0 & 1 & 11 & 0 & 0 & 1 \end{bmatrix}$ into RRE form. **5**

1. (b) Solve the system of linear equations using Gauss Jordan method. **5**

$8x_1 + 2x_2 - 2x_3 = 8,\ 3x_1 + 10x_2 + x_3 = 11,\ x_1 + x_2 + 10x_3 = 20$

OR

1. (a) Check the consistency of given system of linear equations. **5**

$x + y + 4z = 9,\ 8x - 3y + 2z = 20,\ 4x + 11y - z = 33$

1. (b) Find rank of Matrix A = $\begin{bmatrix} 3 & 4 & 7 & 8 & 1 \\ 4 & 5 & 6 & 0 & 4 \\ 0 & 4 & 8 & 3 & 4 \\ 7 & 5 & 5 & 5 & 1 \end{bmatrix}$. **5**

2. (a) Using N.D.D. inverse interpolation, find the value of x for y = 0.333 correct up to four decimal places from the following table : **5**

x	1.0	1.1	1.3	1.5	1.6
f(x)	0.3639	0.3258	0.2612	0.2095	0.1876

2. (b) Obtain the value of $x^3 - 8x - 4 = 0$ by Newton Raphson's method lying between 3 and 4, correct up to 4 decimal places. **5**

OR

2. (a) Find the value of $y = f(\theta)$ at $\theta = 15$ correct up to 4 decimal places from the following table using appropriate method : **5**

θ	10	12	14	16	18
$f(\theta)$	0.176327	0.212556	0.249328	0.286745	0.324920

2. (b) Solve the following system using Gauss Seidel method, correct up to two decimal places. **5**

$10x_1 - 2x_2 - 2x_3 = 9,\ x_1 + 9x_2 - x_3 = 10,\ x_1 - x_2 + 3x_3 = 9$

3. Answer in brief : (Any **five**) **5**

(i) Write definition of rank of a matrix.

(ii) Give an example of inconsistent system of linear equations.

(iii) Write a rank of an identity matrix of order 3.

(iv) We can apply langrage's method to equidistant data point interpolation.
(TRUE / FALSE)

(v) Define diagonally dominant system of linear equations.

(vi) Write an iteration formula for iteration method.
