

Student Name:

Daytime: ☐ Evening: ☐

Student No :

(25)1-Assume that the following system of equations is given. Find  $x_1$ ,  $x_2$ ,  $x_3$ , and  $x_4$ .

$$\begin{bmatrix} 3 & 6 & 1 & 2 \\ 0 & 6 & 3 & 5 \\ 0 & 0 & 4 & 1 \\ 0 & 0 & 0 & 3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} 1 \\ -1 \\ 9 \\ 3 \end{bmatrix}$$

(25)2-Basic Gauss elimination method will fail for the following system of equations. Why does it fail? How do you rearrange the equations to solve it using basic Gauss elimination method?

$$\begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$$

(25)3-Find a ring on the complex plane that contains all nonzero zeros of  $p(z) = 2z^5 - 13z^4 + 26z^3 - 32z^2 + 28z - 10$  (Let  $z_i$  be zero of  $p(z)$ ). You must find  $\rho_1$  and  $\rho_2$  such that  $\rho_1 < z_i < \rho_2$  for  $1 \leq i \leq 5$

(25)4-Find the Lagrange interpolating polynomial for the data given in the table.

|      |    |    |   |   |
|------|----|----|---|---|
| x    | 2  | -1 | 1 | 0 |
| f(x) | -2 | -8 | 2 | 2 |