(Credit will be given only for Correct Solution: **Show All work**)

QI. Consider the following matrix

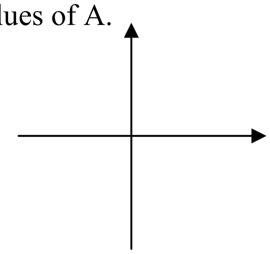
$$A = \begin{bmatrix} d_1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 3|d_3 - d_4| & 2|d_3 - d_4| \\ 0 & 0 & 2|d_3 - d_4| & 0 \end{bmatrix},$$

where *di* = i-th digit of your ID Number.

1) Rewrite the matrix A: $A = \begin{bmatrix} \Box & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & \Box & \Box \\ 0 & 0 & \Box & 0 \end{bmatrix}$

(2) Describe and sketch the Gerschgorin's Circles C1, C2, C3, C4 for the eigenvalues of A.

	C1	C2	C3	C4
Center				
Radius				



(3) Find the eigenvalues of A.

4) Find a matrix Q such that $Q^t AQ = \mathrm{Diag}(\lambda_i)$ [*Diag* (λ_i) *is the diagonal matrix with eigen values of A as Diagonal entries*] Solve this problem on the back of the paper. Show all necessary work.

QII. Find a set from the following vectors which forms a largest set of Linearly independent vectors:

$v_1 = [0, d_3, d_4, 0], v_2 = [0, d_3, d_2, 0], v_3 = [1, d_3, d_5, 0]$

$v_4 = [1, d_3, d_4, 0], v_5 = [0, d_5, d_4, 1]$