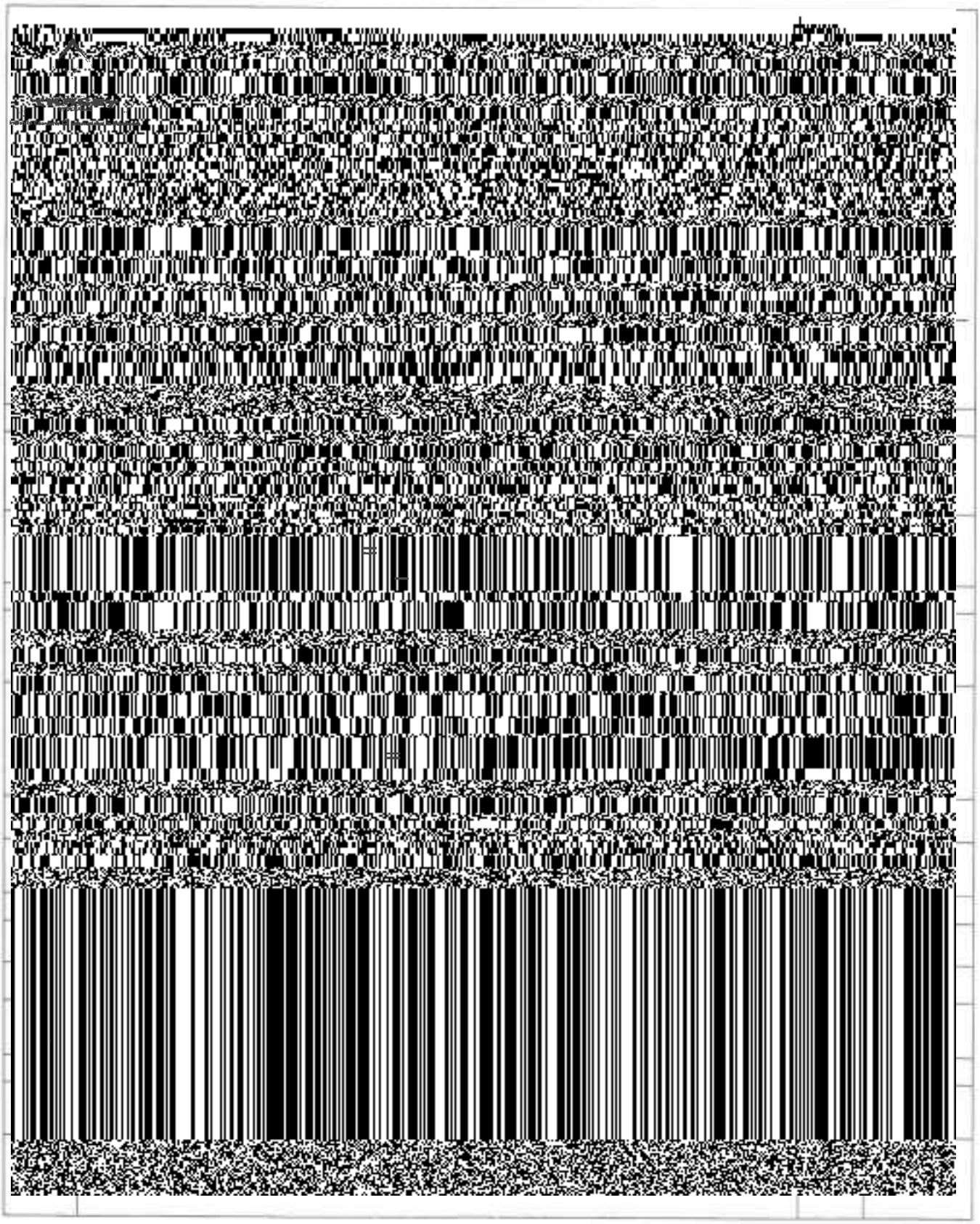

	OR		
3	Find the rank of matrix $A = \begin{bmatrix} 1 & 0 & 2 & 1 \\ 0 & 1 & -2 & 1 \\ 1 & -1 & 4 & 0 \\ 2 & 2 & 8 & 0 \end{bmatrix}$ by reducing it into normal form. [10M]	CO1	L3
4	a) Find the Eigen values and Eigen vectors of $A = \begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & 1 \\ 2 & -1 & 3 \end{bmatrix}$ [5M] b) Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & -3 & 1 \\ 6 & 3 & 1 \\ 1 & 3 & 1 \end{bmatrix}$, find A^4. [5M]	CO2	L2&L2
	OR		
5	Reduce the quadratic form $3x^2 + 2y^2 + 3z^2 - 2xy - 2yz$ to canonical form by orthogonal reduction, and find orthogonal transformation, index and signature, Nature of quadratic form. [10M]	CO2	L3
6	Show that the system of confocal conics $\frac{x^2}{(a^2+\lambda)} + \frac{y^2}{(b^2+\lambda)} = 1$,where λ is a parameter, is self-orthogonal. [10M]	CO3	L2
	OR		
7	a) State Newton's law of cooling. [3M] b) A body kept in air with the temperature 25^0C cools from 140^0C to 80^0C in 20 minutes. Find when the body cools down to 35^0C. [7M]	CO3	L2&L3
8	Solve $(D^2 - 4D + 4)y = 8x^2e^{2x}sin2x$. [10M]	CO4	L3
	OR		
9	Solve $(D^2 - 2D + 2)y = e^x tanx$ by method of variation of parameters. [10M]	CO4	L3
10	Change of order of integration $\int_0^1 \int_{x^2}^{2-x} xy\, dydx$ and hence evaluate the double integral. [10M]	CO5	L5
	OR		
11	Evaluate $\iint y^2 dxdy$ where R is the region bounded by the parabolas $y^2 = 4x$ and $x^2 = 4y$. [10M]	CO5	L5