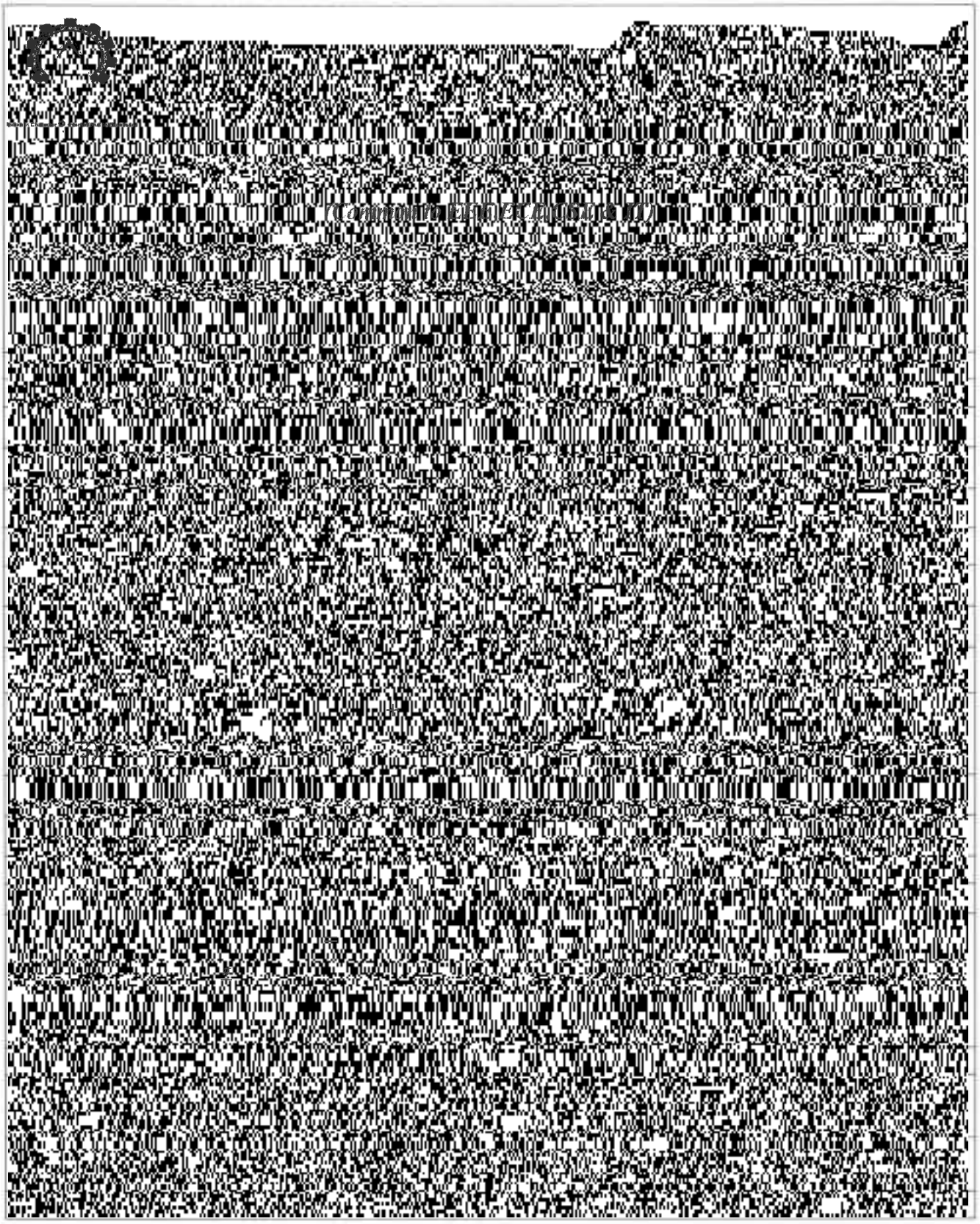

14	Change the order of integration and evaluate $\int_0^1 \int_0^x dydx$	(10M)
15	Show that $\nabla \times (\nabla \times \vec{F}) = \nabla(\nabla \cdot \vec{F}) - \nabla^2 \vec{F}$	(10M)
	OR	
16	(a) Find the value of the constants a, b, c so that the vector $\vec{F} = (x + 2y + az)\vec{\imath} + (bx - 3y - z)\vec{\jmath} + (4x + cy + 2z)\vec{k}$ is irrotational. (b) Find the value of 'a' so that the vector $\vec{F} = (x + 3y)\vec{\imath} + (y - 2z)\vec{\jmath} + (x + az)\vec{k}$ is Solenoidal.	(5M) (5M)
17	Evaluate $\int_C (xy + x^2)dx + (x^2 + y^2)dy$, where C is the square bounded by the lines x=-1,x=1,y=-1,y=1 using Green's theorem.	(10M)
	OR	
18	Use divergence theorem to evaluate $\vec{F} = 4x\vec{\imath} - 2y^2\vec{\jmath} + z^2\vec{k}$ and S is the surface bounded the region x^2+y^2=4, z=0 and z=3.	(10M)
19	(a) Evaluate $L^{-1}\left[\frac{1}{s^2+6s+13}\right]$. (b) Find the Laplace transform of $f(t) = \frac{1-e^{-t}}{t}$.	(5M) (5M)
	OR	
20	Using Laplace transform method $(D^2 + 1)y = t$ given that $y(0) = 1$; $y^1(0) = 0$.	(10M)