$$\nabla \times F = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ z^2 & y^2 & x \end{vmatrix} = \hat{i}(0-0) - \hat{j}(1-2z) + \hat{k}(0)$$

$$= (2z-1)\hat{j}$$

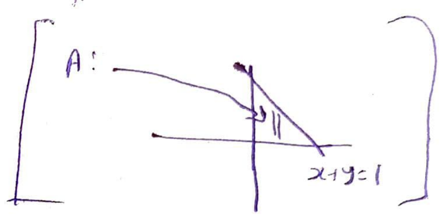
Use <u>stoke's theorem</u>

$x+y+z=1$

$\hat{n} = \dfrac{\hat{i}+\hat{j}+\hat{k}}{\sqrt{3}}$

$$\int F\,dr = \iint (\nabla \times A)\cdot \hat{n}\,dS$$

$$= \iint_A \frac{2z-1}{\cancel{\sqrt{3}}} \times \frac{dx\,dy}{\frac{1}{\cancel{\sqrt{3}}}}$$



$$\Rightarrow \iint 2(1-x-y)-1\,dx\,dy$$

$$\Rightarrow \iint 1-2(x+y)$$

$$\Rightarrow \iint 1 - 2\iint x+y \Rightarrow \frac{1}{2}\times 1\times 1 - 2\int_{x=0}^{1}\int_{y=0}^{1-x} x+y\,dy\,dx$$

$$\Rightarrow \frac{1}{2} - 2\int_{x=0}^{1}\left[xy+\frac{y^2}{2}\right]_0^{1-x} dx \Rightarrow \frac{1}{2} - 2\int_{x=0}^{1} x(1-x)+\frac{(1-x)^2}{2}$$

$$\Rightarrow \frac{1}{2} - \cancel{2}\int_{x=0}^{1} \frac{\cancel{2x}-2x^2+1+x^2-\cancel{2x}}{\cancel{2}} \Rightarrow \frac{1}{2} - \int_{x=0}^{1} 1-x^2\,dx$$

$$\Rightarrow \frac{1}{2} - \left[x-\frac{x^3}{3}\right]_0^1 \Rightarrow \frac{1}{2} - \left[1-\frac{1}{3}\right]$$

$$\Rightarrow \frac{1}{2} - \left[\frac{2}{3}\right] = \frac{3-4}{6} \Rightarrow \boxed{\frac{-1}{6}}\ \text{Ans}$$