1. $\iint_S (x-5y+z)\,dS$ $\quad S: z = 10-x \quad 0 \le x \le 10 \quad 0 \le y \le 10$

$g(x,y) = 10-x$

$f(x,y,g(x,y)) = f(x,y,10-x) = x-5y+10-x$

($x$, $y$, $z$) $= -5y+10$

$g_x = -1 \quad g_y = 0$

$$= \int_{x=0}^{x=10}\int_{y=0}^{y=10} (-5y+10)\sqrt{1+(-1)^2+0^2}\,dy\,dx$$

$$= \sqrt{2}\int_{x=0}^{x=10}\left[-\frac{5}{2}y^2+10y\right]_{y=0}^{y=10} dx$$

$$= \sqrt{2}\int_{x=0}^{x=10}\left[-\frac{5}{2}(10)^2+10(10)-\left(-\frac{5}{2}(0)^2+10(0)\right)\right]dx$$

$$= \sqrt{2}\int_{x=0}^{x=10}(-250+100)\,dx$$

$$= -150\sqrt{2}\int_{x=0}^{x=10} dx$$

$$= -150\sqrt{2}\left[x\right]_{x=0}^{x=10}$$

$$= -150\sqrt{2}\left[10-0\right]$$

$$= \boxed{-1500\sqrt{2}}$$