Question: Let $\mathcal{E} = (Init, KeyGen, Enc, Dec)$ is an encryption scheme. Define the security model (Semantic Security, CCA, CCA2). Are the following $\mathcal{E}$ schemes secure in the defined model. If not show attacks. If yes - show the intuition why.

m any positive integer, K any positive integer build with digits $\{1,\ldots,9\}$	
$c = Enc_K(m)$	$m = Dec_K(c)$
$c = m * K$	$m = c/K$

m any positive integer, K any positive integer.	
$c = Enc_K(m)$	$m = Dec_K(c)$
$c = m + K$	$m = c - K$

Question: Let $(sk, pk) = (x, y = g^x)$ in a well defined group, where assumptions: DLP, CDH, DDH hold. Define the security model (Semantic Security, CCA, CCA2). Are the following $\mathcal{E}$ schemes secure in the defined model. If not If not show attacks. If yes - show the intuition why.

$c = Enc_y(m)$	$m = Dec_x(c)$
$r_1, r_2 \in_R \mathbb{Z}_q^*$ $\alpha_1 = g^{r_1}$, $\alpha_2 = g^{r_2}$ $\beta = y^{r_1} y^{r_2} m$ $c = (\alpha_1, \alpha_2, \beta)$	$m = \beta/(\alpha_1^x \alpha_2^x)$

Function REV reverses the order of bits of its argument.	
$c = Enc_y(m)$	$m = Dec_x(c)$
$r \in_R \mathbb{Z}_q^*$ $\alpha = g^r$ $\beta = REV(y^r) \oplus m$ $c = (\alpha, \beta)$	$m = REV(\alpha^x) \oplus \beta$

$c = Enc_y(m)$	$m = Dec_x(c)$
$r \in_R \mathbb{Z}_q^*$ $\alpha = g^r$, $\beta = (y^r/2)\alpha^2 m$ $c = (\alpha, \beta)$	$m = \beta/((\alpha^x/2)(\alpha^2))$

$c = Enc_y(m)$	$m = Dec_x(c)$
$r \in_R \mathbb{Z}_q^*$ $\alpha = g^r$, $\beta = (y^r/2)(y^r)^2 m$ $c = (\alpha, \beta)$	$m = \beta/((\alpha^x/2)((\alpha^x)^2))$