4a)

$D'((k_1, k_2), c) = D\big(k_1, D(k_2, c)\big)$ if $D(k_2, c) \neq$ reject

Since adversary does not know k_2, he is unable to get any partial information, nor modify it, as the checksum is based also on k_2

4b)

$D'((k_1, k_2), c) = D\big(k_1, D(k_2, c)\big)$ if $D(k_2, c) \neq$ reject

Since adversary knows k_2 , he can get $d' \ = \ E(k_2, m')$

Decrypting m’ breaks integrity

4c)

$$E'' = \ E(E(k_1, m), E(k_2, m))$$

$$D'' = \ D(D(k_1, c), D(k_2, c))$$