Let $\Pi = (Gen, Enc, Dec)$ be a CPA-secure encryption scheme and let $\Sigma = (Gen, Mac, Vrfy)$ be a strongly unforgeable MAC. State whether the following authenticated encryption schemes are secure and justify your answer.

1. “Encrypt-and-Authenticate”: Encryption and message authentication are computed independently in parallel:
   \[
c \leftarrow Enc_{k_E}(m) \quad t \leftarrow Mac_{k_M}(m)
   \]
   Output: $\langle c, t \rangle$

2. “Authenticate-then-encrypt”: Mac tag $t$ is first computed, and then the message and tag are encrypted together.
   \[
t \leftarrow Mac_{k_M}(m) \quad c \leftarrow Enc_{k_E}(m||t)
   \]
   Output: $c$

3. “Encrypt-then-authenticate: The message $m$ is first encrypted and then a MAC tag is computed over the result.
   \[
c \leftarrow Enc_{k_E}(m) \quad t \leftarrow Mac_{k_M}(c)
   \]
   Output: $\langle c, t \rangle$