

Problem 3.1.

For 100 percent modulation, is it possible for the envelope of AM to become zero for some time t ? Justify your answer.

Solution

By definition, the envelope of AM signals is $A_c[1 + k_a m(t)]$, where A_c is the carrier amplitude, k_a is the amplitude sensitivity of the modulator, and $m(t)$ is the message signal. The envelope will assume the zero value if and only if

$$k_a m(t) = -1$$

So long as this condition is satisfied, then the envelope of the AM signal will assume the value zero.