Answer on Question #41373, Physics, Other

A message signal of frequency 10 kHz and peak voltage of 10 volt is used to modulate a carrier of frequency 106 Hz and peak voltage 20 volt. Then depth of modulation is :-

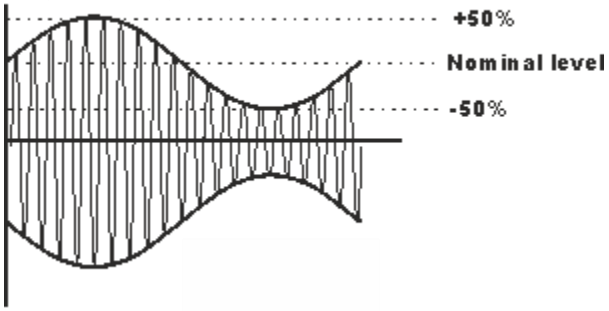
(1) 0.25 (2) 0.5 (3) 1 (4) 2

Solution:

The modulation index (or modulation depth) of a modulation scheme describes by how much the modulated variable of the carrier signal varies around its unmodulated level. It is defined differently in each modulation scheme.

The amplitude modulation depth is given by M/A, where M is peak amplitude of the message wave and A is the peak amplitude of the carrier wave.

Typically the modulation index of a signal will vary as the modulating signal intensity varies. However some static values enable the various levels to visualised more easily.



The amplitude modulation depth is

$$\mu = \frac{M}{A} = \frac{10\ \text{V}}{20\ \text{V}} = 0.5$$

Answer. (2) 0.5