A carrier wave with amplitude of 250 V is amplitude modulated by a sinusoidal base band signal of amplitude 150V. The ratio of minimum amplitude to maximum amplitude for the amplitude modulated wave is 50 : x, then value of x is

Explanation

Given, the amplitude of the carrier wave, $A_c = 250$ V

The amplitude of the message wave, $A_m = 150$ V

We know that,

The maximum amplitude, $A_{max} = A_c + A_m$

Substituting the values in the above equation, we get

$A_{max} = 250 + 150 = 400$ V

We know that,

$A_{max} = 250 + 150 = 400$ V

We know that,

The minimum amplitude, $A_{min} = A_c - A_m$

Substituting the values in the above equation, we get

$A_{min} = 250 - 150 = 100$ V

Thus, the ratio of the minimum amplitude to the maximum amplitude of the modulated wave is

$$\frac{A_{min}}{A_{max}} = \frac{100}{400} = \frac{1}{4}$$

Comparing with, 1 : x

The value of the x = 4.