Answer on Question#40536 – Physics – Mechanics

A radio-station broadcasts on wavelength 3 m. If velocity of radio-waves is 3 * 108 m/s,find out its frequency.

Solution:

$\lambda = 3\text{m} - \text{wavelength};$

$\text{v} = 3 \times 10^8 \frac{\text{m}}{\text{s}} - \text{velocity of the wave};$

Formula for the frequency of the wave (T-period of the wave):

$$\text{f} = \frac{1}{\text{T}} \quad (1)$$

The period of a wave is the time for a particle on a medium to make one complete vibrational cycle:

$$\text{T} = \frac{\lambda}{\text{v}} \quad (2)$$

$(2)\text{in}(1)$:

$$\text{f} = \frac{1}{\frac{\lambda}{\text{v}}} = \frac{\text{v}}{\lambda} = \frac{3 \times 10^8 \frac{\text{m}}{\text{s}}}{3\text{m}} = 10^8\text{Hz}$$

Answer: frequency of the wave is equal to 10^8Hz.