Answer on Question #59289, Physics / Mechanics | Relativity |

If light travels at $3 \cdot 10^8$ m/s and its frequency is $6 \cdot 10^{15}$ Hz, then its wavelength is:

$10 \cdot 10^7$ m

$5 \cdot 10^{-8}$ m

$5 \cdot 10^{-7}$ m

$10 \cdot 10^{-7}$ m

Solution:

$$Speed = Wavelength \bullet Frequency$$

The above equation is known as the wave equation. It states the mathematical relationship between the speed (v) of a wave and its wavelength (λ) and frequency (f).

Using the symbols v, λ, and f, the equation can be rewritten as

$$v = f \cdot \lambda$$

Hence,

$$\lambda = \frac{v}{f} = \frac{3 \cdot 10^8}{6 \cdot 10^{15}} = 5 \cdot 10^{-8} \text{ m}$$

Output: $5 \cdot 10^{-8}$ m