

NCERT Physics Chapter-15 Q7

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QUESTION 7:

A hospital uses an ultrasonic scanner to locate tumors in a tissue. What is the wavelength of sound in the tissue in which the speed of sound is 1.7 km/s? The operating frequency of the scanner is 4.2 MHz.

SOLUTION:

Using the wave equation of sound,

Input Parameter	Value
v	1.7×10^3
f	4.2×10^6

$$v = f\lambda$$

$$\lambda = \frac{v}{f}$$

$$\lambda = \frac{1.7 \times 10^3}{4.2 \times 10^6} \text{ m}$$

$$\lambda = 4.047 \times 10^{-4} \text{ m} \quad (1)$$