NCERT Physics Chapter-15 Q7

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QUESTION 7:

A hospital uses an ultrasonic scanner to locate tumours 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 relation between frequency, speed of sound, and wavelength:

$$v = f\lambda \tag{1}$$

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

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

$$\lambda = 4.047 \times 10^{-4} m \tag{2}$$