NCERT 11.15. Q10

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Question A radio can tune in to any station in the 7.5 MHz to 12 MHz band. What is the corresponding wavelength band?

Solution The wavelength (λ) of a radio wave is inversely proportional to its frequency (f).

Parameter	Description	Value
$f_{\max}$	Maximum Frequency	12 MHz
$f_{\min}$	Minimum Frequency	7.5 MHz

TABLE 1
GIVEN PARAMETERS LIST

For 7.5 MHz:

$$\lambda_{max} = \frac{c}{f_{min}} \tag{1}$$

$$= \frac{(3 \times 10^8)}{(7.5 \times 10^6)} \tag{2}$$

$$= 40 \text{ meters} \tag{3}$$

For 12 MHz:

$$\lambda_{min} = \frac{c}{f_{max}} \tag{4}$$

$$= \frac{(3 \times 10^8)}{(12 \times 10^6)} \tag{5}$$

$$= 25 \text{ meters} \tag{6}$$

Therefore, the corresponding wavelength band is from 25 meters to 40 meters.