Answer on Question#40534, Physics, Mechanics

Question:

The distance between 2 consecutive crests of waves of water colliding with a boat tied to an anchor is 100 m.If velocity of wave is 20 m/s,then after how much time would the wave collide with the boat? What would be the frequency of wave colliding with the boat?

Answer:

The frequency f of wave is equal to the phase velocity v of the wave divided by the wavelength λ of the wave:

$$f = \frac{v}{\lambda} = \frac{20\,\frac{m}{s}}{100\,m} = 0.2\,Hz$$

Therefore, the wave will collide with the boat after:

$$T = \frac{1}{f} = \frac{1}{0.2} = 5\,s$$

Answer: $T = 5s, f = 0.2\,Hz$