Date: 05-02-2025

Sem-2/ MJC (T) / Unit-3

Subject - Physics / By - Vinay K Singh

Continue Beats :-

The maximum value of the amplitude $A = \pm 2a$, then

$$\cos 2\pi \left(\frac{n-m}{2}\right) t = \pm 1$$

or, $\pi (n-m) t = K\pi$, where $K = 0, 1, 2, 3$, etc.

or, $t = \frac{K}{n-m} = 0, \frac{1}{n-m}, \frac{2}{n-m}, \frac{3}{n-m} \ldots\ldots$

and so on i.e t is an integral multiple of $\frac{1}{n-m}$

The time value ~~of~~ between two consecutive maxima $= \frac{1}{n-m}$.

The frequency of maxima $= n-m$

The maximum value of the amplitude $A=0$ when,

$$\cos 2\pi \left(\frac{n-m}{2}\right) t = 0$$

or, $\pi (n-m) t = K\pi + \pi/2$, where $K = 0, 1, 2, 3$ etc

or, $t = \frac{K}{n-m} + \frac{1}{2(n-m)}$

$$= \frac{1}{2(n-m)} + \frac{3}{2(n-m)} + \frac{5}{2(n-m)} \ldots$$

for $K = 1, 2, 3$, and so on i.e, t is the odd multiple of $\frac{1}{2(n-m)}$

The maxima are, therefore, regularly timed between the maxima. The time interval between consecutive minima $= \frac{1}{n-m}$

$\therefore$ The frequency of minima, $= n-m$

Since, one maximum and one minimum sound constitutes a beats, the no. of beats $= n-m$. The intensity of the resultant sound rises and falls $= n - m$ times per second.