6-20 Modern Language School Class 10
sics

Calculation of intensity of sound :-

According to Webes frechet law intensity and loudness are related as

$$L \propto \log I \quad \rightarrow (1)$$

$$L_0 \propto \log I_0 \quad \rightarrow (2)$$

(L_0 = Fainst audable sound)

Sub eq (1) and (2)

$$L - L_0 \propto \log I - \log I_0$$
$$L - L_0 = K \log I - \log I_0$$
$$L - L_0 = K \log \frac{I}{I_0}$$

$L - L_0$ is difference of loudness between unknown sound and fainest audioable sound and called sound level or intensity level

Intensity level $= K \log \frac{I}{I_0}$

Unit I_0 is always taken as $10^{-12}\ Wm^{-2}$

Suppse Intensity of unknown sound is 10 times I_0 i.e $I = 10 I_0$

then value of $K = 1$ and unit is called bell

intensity level $= \log \frac{I}{I_0}$ (bel)

Bell is bigger unit, we divide bell into ten equal parts then unit is called decibell (dB)

$$\text{Intensity level} = 10 \log \frac{I}{I_o} \text{ (dB)}$$

Q) What you know about reflection of sound? What are conditions of echo?

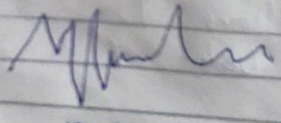
Ans When sound is incident on the surface of a medium it bounce back into the first medium. This phenomenon is called reflection of sound or echo.

Conditions of echo:-

To hear clear echo distance from source of sound and reflecting surface should be 17m and time to rehear sound should be 0.1 s

Q) Explain that noise is nuisance.

Ans Sound which has jarring and unpleasant effect on our ears is called noise



noise

Noise has negative effects on human health as it can cause hearing loss, sleep disturbances, aggression hypertension.

2) Explain the importance of acoustics.

The technique or method used to absorb undesirable sounds by soft and porous surfaces is called acoustic protection.

Importance:-

Reflection of Sound is less prominent when surface is soft and irregular. Therefore at noisy places and places where we want to remove unwanted sound we use soft and porous material on walls, celling. Lecture hall, meeting rooms are made noiseless by this method.

Secondly when hall and audience are large like in theaters halls multiple reflection reduce sound energy so we use curved surface to avoid multiple reflection and direct sound to audience.