

Environmental Engineering

Tutorial 4(b) – Sound Level

Answer all questions

- 1 A pneumatic drill, an air compressor and a concrete mixer individually create noise levels of 70dB, 67 dB and 68 dB respectively measured from a fix distance. Calculate the resultant noise level at this point when all three units are operating at the same time.
- 2 State the units in which sound pressure level is most commonly measured and explain why a doubling of sound pressure level causes a meter reading to rise by 6 units.
- 3 Calculate the sound pressure level in dB of a sound whose mean squared pressure is 2 N/m^2 (ref: $2 \times 10^{-5} \text{ N/m}^2$).
- 4 Determine the sound pressure level in dB of a sound whose intensity is 0.005 W/m^2 (ref : 10^{-12} W/m^2).
- 5 A noise has the following octave band analysis. Calculate the sound pressure level in dB.

Octave Band	SPL
<u>Centre frequency (Hz)</u>	<u>(dB)</u>
125	45
250	53
500	61
1000	58
2000	49

- 6 Calculate the total intensity in W/m^2 for the sound in Question 5.
- 7 Define Sound Power Level.
Calculate the sound pressure level at a distance 100 m over a flat non-absorbent ground of a sound of sound power level 110 dB.
- 8 Calculate the sound power level of a source which radiates uniformly over flat unobstructed ground and produces a sound pressure level of 62 dB at a distance 10 m.
- 9 A policeman measuring motor vehicle noise is exactly 7.5 m from the line of traffic on a straight road. The reading shown on his meter is 86 dB(A). An isolated house faces the road and is exactly 30 m from the line of traffic. The house was constructed to be able to reduce noise level by 25 dB.
What would you expect the sound of traffic to be inside the house :
 - a) The policeman's reading was from an isolated vehicle.
 - b) The reading was taken from a continuously closed packed line of identical cars.