

IT 760 Noise Monitoring & Control

Major Test

Time: 2 Hour
Attempt All Questions

Max Marks: 40

1. Answer the following very briefly. (10)

- i) At what frequency human ear is most sensitive?
- ii) Under what conditions a series of impulse noise can be considered as steady noise?
- iii) What are A and B-Durations in "CHABA" criteria for impulse noise?
- iv) What are the response times in Fast and Slow settings in sound level meters?
- v) Are the following quantities vector or scalar (a) Particle velocity (b) Sound intensity?
- vi) What is the purpose of evaluating field indicators in the case of sound power determination by sound intensity measurements?
- vii) What is the practical limit of noise attenuation by barriers?
- viii) Estimate the sound power that will be generated by a 10 MW steam turbine.
- ix) Which pipe bend will produce less noise - 90° or 120° and why?
- x) What is the noise frequency range in which diesel engine "knock" occurs?

2.

- i) A machine has two major noise sources producing 88 and 92 dB(A) noise levels. How much the noise of second source should be reduced so that the total noise of the machine is 90 dB(A)? (3)
- ii) A worker is exposed to 80 dB(A) noise level at his work place, but when he operates a noisy machine, he is exposed to 98 dB(A) level. If the noisy machine operation is for 20% of his total 8 hours working time a) Compute L_{eq} noise level to which he is exposed b) For how many hours he should operate the noisy machine if total 8 hours L_{eq} exposure is to be limited to 90 dB(A) only? (4)

3.

- i) What is Phase mismatch error in sound intensity measurements? (3)
- ii) Explain "Hanning" weighting used in FFT analysis. (3)

P.T.O.

4.

A 1500 rpm motor drives a shaft on which a gear with 15 teeth is mounted. Driven gear has 20 teeth. The driven gear shaft has two deep groove ball bearings – each having 8 balls of 4 mm dia. Pitch circle dia. of bearings is 72 mm. At what frequency a defect on the outer race of one of these ball bearings will appear in noise Cepstrum? (4)

5.

- i) Write a short note on “maintenance and noise reduction”. (3)
- ii) A noise source is at a distance of 6 m from a 4 m high barrier. What will be the noise attenuation at 500 Hz at the receiver position, which is 10 m from the barrier. Assume both the source & the receiver to be at a height of 2 m from the ground. (3)

6.

- i) Explain the “Feedback control” system of active noise control. (3)
- ii) List sources of noise in road vehicles. How is tyre noise generated? (4)