



AUBURN UNIVERSITY

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COLLEGE OF ENGINEERING

AEROSPACE

AERO 4970/7970

**Fundamentals of Aeroacoustics
Occupational Noise and Standards**

SET VIII

1. A room is 5 m by 8 m by 2.4 m high. The room has a carpet with an absorption $\alpha = 0.37$, the ceiling and two walls (one 5 by 2.4 m and the second 8 by 2.4 m) are sheet rock with an $\alpha = 0.04$, and the remaining two walls are concrete, $\alpha = 0.02$. What is the reverberation time for this room?
2. Consider a location where the following SPL versus time pattern may occur.

<u>Level (dBA)</u>	<u>Time</u>
45	midnight to 6 a.m.
50	6 a.m. to 8 a.m.
54	8 a.m. to noon
57	noon to 7 p.m.
50	7 p.m. to midnight

- a) Calculate the 24 hr equivalent sound level, L_{eq} .
 - b) Calculate the Day-Night sound level, L_{dn} .
 - c) Based on the community reaction data what would the community reaction be to this noise pattern?
3. It is predicted that a worker in a new plant will receive the following noise exposure during an 8 hr working day. Will this exposure exceed the OSHA standard? What is the percentage dose? What is the time weighted average exposure?

<u>Level (dBA)</u>	<u>Period (hrs)</u>
101	1.5
90	1.0
87	4.0
81	1.0
77	0.5

4. If the above data causes the worker to exceed the permissible exposure level, how could the levels be changed to reduce the exposure to an acceptable value? The time periods will remain fixed due to the tasks that must be accomplished, but the levels can be reduced by noise control.