**Applied Acoustics - 17/10/2014 In-class test - Lecturer: Angelo Farina**

Note: some input date are based on the 6 digits of Matricula number, assigned to the 6 letters A B C D E F.

If for example the matricula is 123456, it means that A=1, B=2, C=3, etc. .

Furthermore CD=34 (NOT 3x4), DE =45, EF =56.

**Warning: On-line compilation of this form warrants TWO additional score points.**

Top of Form

**Surname and Name**

F

E

D

C

B

A

**Matricula**

**What's the decay rate with distance for a point-like source ?**  (one answer only)

* 3 dB / octave
* 6 dB / meter
* 6 dB / doubling distance
* 3 dB / doubling distance
* DL2 = 3 dB

**What's the decay rate with distance for a line source ?**  (one answer only)

* 3 dB / octave
* 6 dB / meter
* 6 dB / doubling distance
* 3 dB / doubling distance
* DL2 = 3 dB

**The effect of air absorption :**  (multiple answers allowed)

* becomes large only at very low frequencies
* becomes large only at high frequency
* is proportional to distance (dB/km)
* is proportional to the logarithm of distance (dB / doubling distance)
* depends on air's temperature and humidity

**What happens in the near field of a point source (kr <<1) ?** (multiple answers allowed)

* Both sound pressure and particle velocity increase as 1/r
* Sound pressure increases as 1/r, particle velocity increases as 1/r²
* Both sound pressure and particle velocity increase as 1/r²
* Sound pressure and particle velocity get out of phase
* The acoustic impedance tends to zero
* The acoustic impedance tends to infinity

**A point source radiates in free field with a power of 1+F/10 W, and a directivity factor Q=1+E/4. Compute the value of SPL at a distance of 10+D meters.**  (write number and measurement unit)

**On a road the traffic is 1000+EF\*10 vehicles/h, with a speed of 100+CD km/h. If the sound power level of a single vehicle is 100 dB(A), what's the SPL at a distance of 50+F meters?** (write number and measurement unit)

**At 25m from a railway, the long-term averaged spectrum of noise is as follows: 80+F dB at 125 Hz, 75+E dB at 250 Hz, 80+D dB at 500 Hz, 82+C dB at 1 kHz, 84+B dB at 2 kHz, 80+A dB at 4 kHz. Compute the total SPL in dB(A)**

(write number and measurement unit)

**In the case of previous exercise, re-compute the total SPL in dB(A) after inserting a noise barrier at 5m from the railway with an effective height of 3+F/5 m**  (write number and measurement unit)