**Applied Acoustics - 28/11/2014 In-class test - Lecturer: Angelo Farina**

Note: some input data 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 EF=56 (NOT 5x6).

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

Top of Form

**Surname and Name
+ signature**

F

E

D

C

B

A

**Matricula**

1) The traffic along a road, measured during the day period (06-22), is of 10000+EF·100 cars, 1000+DE·100 motorbikes, and 2000+DE·100 trucks. Compute Leq,day knowing that the SEL of these three types of vehicles are respectively equal to 80+F, 90+E and 100+C dB(A).

*write number and measurement unit (with a space in between and no other spaces)*

2) In the case of previous exercise, recompute the value of Leq when the distance from the road axis is equal to 50+F m, instead of 7.5m.

*write number and measurement unit (with a space in between and no other spaces)*

3) In the case of previous exercise, compute the value of Lep for a worker which stays in that position for 2+E hours.

*write number and measurement unit (with a space in between and no other spaces)*

4) A reverberant room has a volume of 200+EF m³. The initial reverberation time is 6+F/2 s, and reduces to 2+E/5 s when a sample of absorbing material is inserted, having a surface of 10+D/2 m². Compute the sound absorption coefficent α of the sample according to ISO 354.

*write number and measurement unit (with a space in between and no other spaces)*

5) In the case of previous exercise, compute the SPL reduction caused by inserting the sample inside the reverberant room.

*write number and measurement unit (with a space in between and no other spaces)*

6) In a standing wave tube, the maximum SPL is 90+F dB and the minimum SPL is 80+E dB. Compute the sound absorption coefficent α of the sample according to ISO 10534.

*write number and measurement unit (with a space in between and no other spaces)*

7) In a standing wave tube, the Energy Density Level is 90+F/2 dB and the Sound Intensity Level is 85+E/2 dB. Compute the sound absorption coefficent α of the sample with the Sound Intensity method.

*write number and measurement unit (with a space in between and no other spaces)* 

8) An EN-1793-5 measurement is performed at 0° incidence angle with dsm=1+F/20 m and dm=0.2+E/100 m. The incident sound impulse has an SPL=90+F dB, the reflected sound impulse has an SPL=85+E/2 dB. Compute the sound absorption coefficent α of the barrier.

*write number and measurement unit (with a space in between and no other spaces)*

9) A linear sound source produces a free field SPL = 60+E dB(A) . A noise barrier with DLri=1+F/3 dB(A) is placed just behind the microphone. Recompute the new value of SPL taking into account the barrier's reflection.

*write number and measurement unit (with a space in between and no other spaces)*

10) Repeat the computation of previous exercise (new SPL including barrier reflection) in the case the microphone is at a distance of 10+F m from the line source and the barrier is 4+D/3 m behind the microphone.

*write number and measurement unit (with a space in between and no other spaces)*