**Applied Acoustics - 11/12/2017 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, during the day period (06-22), is of 10000+E·1000 cars. Compute the SEL of a single car pass-by, knowing that the total value of Leq is equal to 60+F dB(A) and that the background noise (when no car is passing) is 55+F dB(A).

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

2) In the case of previous exercise, re-compute 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 exercise 1), compute the value of Lep for the acoustician who attended the measurements, standing at the measurement position for the whole day period.

*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 coefficient 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 reduction of the level of reverberant field 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 Standing Wave Ratio (max pressure / min pressure) is 6+F. Compute the sound absorption coefficient 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 value of rE=I/(D·c) is 0.1+E/30. Compute the sound absorption coefficient α of the sample with the Sound Intensity method.

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

8) What is the correct definition of the new EC parameter called Lden?

*(a single answer)*

* The equivalent level averaged over the 24 hours
* The arithmetic average between Lday, Levening, Lnight
* The energetic average between Lday, Levening, Lnight
* The energetic average between Lday, Levening, Lnight, where Levening is increased by 5 dB and Lnight is increased by 10 dB
* The time-weighted energetic average between Lday, Levening, Lnight, where Levening is increased by 5 dB and Lnight is increased by 10 dB

9) What is the correct definition of differential noise limit according to Italian law?

*(a single answer)*

* The difference between Leq,day and Leq,night
* The difference between the SPL generated by a sound source and the background noise level
* The difference between environmental noise level and the residual noise level (which means the total Leq with and without a specific sound source switched on) both measured on short times (a few minutes).
* The difference between the SPL outside (at 1m from the closed window) and the SPL inside the room