**Applied Acoustics - 30/10/2015 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 CD=34 (NOT 3x4), DE =45, EF =56.

Top of Form

**Surname and Name**

F

E

D

C

B

A

**Matricula**

**What are the relations between** α **a, r and t ?**

* a + r + t = 1 *(multiple answers)*
* α is always smaller than a
* α = 1 - r = a + t
* a = 1 - r = α + t
* α can be larger than one, a is always smaller than 1

**At the critical distance dcr:** *(one answer only)*

* the direct sound becomes negligible
* the direct sound equals the reverberant sound
* the critical distance is the cubic root of the room's volume
* the source directivity becomes irrelevant
* above this distance, the SPL does does not change anymore

**What's the correct definition of reverberation time T20?** *(one answer only)*

* The time after the source is switched off required for a sound decay down to the background floor
* The time after the source is switched off for a decay down to 60 dB
* The time required for the sound level to reach a value which is 60 dB smaller than initial sound level
* 3 times the time required for the sound level to diminish from -5 to -25 dB re the initial sound level
* The value predicted by the Sabine's formula

**What’s the formula for computing environmental correction factor K2 for a Sabinian room?** *(one answer only)*

* K2 = Lw - Lp
* K2 = 10\*log10(S/A)
* K2 = 10\*log10(4\*S/A)
* K2 = 10\*log10(1+4\*S/A)
* K2 = 20\*log10(1+4\*S/A)

**Compute the average absorption coefficient α in a room which measures (10+F)x(6+E)x(3+D) meters, having a reverberation time of 2+F/10 s**

*write number and measurement unit*

**Compute the critical distance in the room of previous exercise, for a source with Q=5+F/2**

*write number and measurement unit*

**Compute the SPL at a distance of 2+F/5 m from an omnidirectional source (Lw=100dB) placed over the reflecting floor in the same room as the previous exercises**

*write number and measurement unit*

**An industrial building is 100m long, 50m wide, and the height is 4+F/3 m. The reverberation time is 3+E/5 s. Compute the difference between the real value of the environmental correction factor K2 with the Fornari/Farina formula for a machine having an enveloping surface S of 100+EF m2.**

*write number and measurement unit*