**Applied Acoustics - 23/11/2018 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).

Top of Form

**Surname and Name**

F

E

D

C

B

A

**Matricula Signature**

**1) 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

**2) What is the definition of Modulation Transfer Function ? (one answer only)**

* The reduction of modulation due to noise and echoes
* The ratio between the initial modulation and the modulation of the received sound
* The ratio between modulation of the received sound and the initial modulation
* The signal to noise ratio for a given modulation frequency
* The value of STI for a given octave band

**3) What is the definition of center time ts? (one answer only)**

* The integral of current time multiplied by squared pressure
* The integral of current time multiplied by squared pressure divided by the integral of squared pressure
* The integral of the ratio between current time multiplied by squared pressure divided by the squared pressure
* The time at which the previous energy equates the subsequent energy
* The time between the sound is emitted and the sound is received

**4) What is the definition of Lateral Fraction LF? (one answer only)**

* It is the ratio between the lateral sound and the total sound over the first 80 ms
* It is the ratio between the integral of the squared signal from a figure of 8 microphone and the integral of the squared signal of an omni microphone over the first 80 ms
* It is the cross correlation between the signals of an omni and a figure of eight microphones
* It is integral of the ratio of the squared signals coming from a figure of eight and an omni microphones, evaluated between 5 ms and 80 ms
* It is the ratio between the integral of the squared signal from a figure of 8 microphone evaluated from 5 to 80 ms and the integral of the squared signal of an omni microphone evaluated from 0 to 80 ms

**5) Compute the value of T20 in a room where the integrated Schroeder plot show a linear decay with a slope of 30+F dB/s**

*(write number and measurement unit)*

**6) In a cubic room, with a side of 5+F/2 m and an average absorption coefficient α=0.1+D/100, the SPL is too large. Compute the quantity of absorbing material, having an absorption coefficient of 0.3+E/30, to be inserted for getting an SPL reduction of the reverberant field of 5 dB**

*(write number and measurement unit)*

**7) An acoustic panel has a value of α =0.3+F/30 and of t=0.1. Compute the value of the sound absorption coefficient a.**

*(write number and measurement unit)*

**8) Compute the value of r for the acoustic panel of previous exercise.**

*(write number and measurement unit)*

**8) The sound reflected by a surface is attenuated by 10+E dB. Compute its absorption coefficient α.**

*(write number and measurement unit)*