**Applied Acoustics – Test 2/2020 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.

Top of Form

**Surname and Name**

F

E

D

C

B

A

**Matricula**

1. **What is the meaning of the Environmental Correction Factor K2A?**

*one answer only: 1 point if correct, -1 point if wrong, 0 point if "no answer"*

* It is the level caused by the reverberant sound field, which sums energetically to the level caused by the direct sound
* It is the boost in level caused by the noise created by other sources than the one being evaluated
* It is the boost in level caused by the room reflections, with reference to the level which would be measured at the same distance form the source, outdoors
* It is the difference between the sound power level (cause) and the sound pressure level (effect)
* It is the difference between the sound pressure level and the sound intensity level
* I do not know (no answer)

**2) Inside a factory which is "wide and short", how can you estimate the correct value of the Environmental Correction Factor K2A?**

*one answer only: 1 point if correct, -1 point if wrong, 0 point if "no answer"*

* With the standard formula K2A = 10\*log10(1+4\*S/A)
* With the Sabine formula, reversed: A = 0.16\*V/T
* With the Farina/Fornari formula
* Measuring directly the SPL around the sound source using a sound level meter
* As the room does not follow the Sabine's constraints, it is impossible to predict K2A.
* I do not know (no answer)

**3) What is the effect on increasing the amount of absorption (A) inside a room?**

*multiple answers allowed: for each answer, 1 point if correct, -1 point if wrong, 0 point if "not selected"*

* The SPL decreases everywhere by the same amount, as K2A reduces
* The SPL decreases significantly close to the source, and much less far away
* The SPL decreases significantly far from the source, and almost nothing close to the source
* The reverberation time increases
* The reverberation time decreases
* The value of DL2 increases, tending to 6 dB/doubling distance in case of a perfectly anechoic room

**4) Which kind of impulsive test source is better suited for measuring the impulse response in a large sport palace?**

*multiple answers allowed: for each answer, 1 point if correct, -1 point if wrong, 0 point if "not selected"*

* Balloons
* Firecrackers
* Clapping machine
* Loudspeaker
* Hand clapping
* Blank pistol

**5) A point source is placed on the floor inside a Sabinian room having a volume of 200+EF m3 and a reverberation time of 3+F/5 s. Compute the value of K2A at 2+E/10 m from the source.**

*write number and measurement unit*

**6) A sound treatment is added to the room of the previous exercise, which causes the reverberation time to reduce to 1.0 s. Compute the new value of K2A.**

*write number and measurement unit*

**7) In a Sabinian room, the SPL decays by 30+E dB during the second following the instant when the source is switched off. Compute the value of the reverberation time T20.**

*write number and measurement unit*

**8) An ESS measurement is performed with a signal sweeping from 20+E\*10 Hz to 20 kHz, 5+F s long, exponential. After convolution with the inverse sweep, the noise is attenuated significantly. What is the maximum theoretical attenuation (evaluated applying directly the inverse sweep to the test signal)?**

*write number and measurement unit*