**Applied Acoustics - 30/11/2021 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 you do not have yet a matricula number use your date of birth: DDMMYY.

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.

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**Surname and Name**

F

E

D

C

B

A

**Matricula**

1. **Check the sentences you think are always TRUE**  (multiple answers allowed)

* Environmental noise is mostly caused by vehicles
* Environmental noise is mostly caused by factories
* The differential noise limits should be verified outdoors (microphone outside the window)
* The differential noise limits should be verified indoors (both with open an closed windows)
* The Impact Noise limit is a maximum value (not to be exceeded)
* The Impact Noise limit is a minimum value (to be reached or surpassed)

1. **Along a road the traffic flow is doubled, but the speed is unchanged. The consequences are:**   
   (multiple answers allowed)

* The distance between vehicles, a, remains constant
* The distance between vehicles, a, reduces to half
* The distance between vehicles, a, doubles
* The maximum SPL occurring when a vehicle is just in front of the microphone does not change
* The maximum SPL occurring when a vehicle is just in front of the microphone increases by 3 dB
* The value of La,eq at the listener position does not change
* The value of La,eq at the listener position increases by 3 dB

1. **What is the correct definition of SEL?** (a single answer)

* It is the maximum level when a vehicle is passing in front of the microphone
* It is the equivalent level integrated over the duration of 1s
* It is the equivalent level integrated over the duration T of an event, La,eq, plus 10\*log10(T/T0),   
  where T0 is equal to 1s
* It is the equivalent level integrated over the duration T of an event, La,eq, plus 10\*log10(T/T0),   
  where T0 is equal to 8h
* It is a measure of the total acoustical energy associated with an event
* It is a measure of the total acoustical power associated with an event

1. **In a standing wave tube the difference between SPLmax and SPLmin is 3+F/4 dB. Compute the apparent absorption coefficient, α, of the sample inserted in the tube.**(write number and measurement unit)
2. **In a standing wave tube the difference between Ld and Li is 3+F/4 dB. Compute the apparent absorption coefficient, α, of the sample inserted in the tube.**(write number and measurement unit)

1. **A measurement according to EN 1793/5 is performed on a noise barrier, with dsm=1.5m and dm=0.5m. The difference between the incident SPL and the reflected SPL is 3+F/4. Compute the apparent absorption coefficient, α, of the barrier.**   
   (write number and measurement unit)

<<< FOLLOWS ON BACK >>>

1. **A reverberant room has a volume of 200+EF m3. The reverberation time of the room (empty) is 6+D/4 s. After inserting a surface S=10+E m2 of absorbing material, the new reverberation time reduces by 2s. Compute the apparent absorption coefficient, α, of the absorbing material.**(write number and measurement unit)

1. **Compute the Personal Exposure Level, Lep, of a worker having the following exposure profile:**

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(write number and measurement unit)