# **Applied Acoustics – 17 September 2019**

Name & Surname:

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Matricula:

**Exercise 1 (tolerance +/- 0.05, 0.5 dB)**

A plane wave impinges orthogonally against a planar surface, having an absorption coefficient  equal to 0.4+F/50. Compute the Reactivity Index (LD-LI) in dB and the reduction of the reflected SPL compared with the incident SPL.

* reactivity Index LD-LI dB (5 points)
* Reflected Sound SPL reduction dB (5 points)

**Exercise 2 (tolerance +/- 0.5 dB)**

An omnidirectional point source, radiating incoherent noise, is located inside a room, having dimension of m (6+F)x(4+E)x(2+D/2) and with an average value of the absorption coefficient α=0.3+F/50. The Sound Power Level Lw is equal to 100+D dB.

A microphone is located at a distance of 3+E/2 m.

Determine the following values of the SPL at the microphone.

* Direct Sound SPL dB (5 points)
* Reverberant Sound SPL dB (5 points)
* Total SPL dB (5 points)

**Exercise 3 (tolerance +/- 0.5 dB)**

A point-like sound source radiates a dominant pure tone at a frequency of 120+F\*20 Hz. For attenuating it, a noise screen is employed. At the listening point, without barrier, the source produces an SPL of 80+F dB. The barrier causes an increase of the path between source and receiver,  = 1+E/10 m. Compute the new value of SPL after installing the barrier.

* Total SPL dB (5 points)