# **Applied Acoustics – 19 February 2016**

Name & Surname:

E

D

C

B

A

F

Matricula:

**Exercise 1 (tolerance +/- 1 dBA)**

A plant for compacting domestic garbage consists in two machines, located close each other, over a smooth concrete pavement. A single acoustic measurement is performed, placing a sound level meter in a position which is equidistant from both machines, and this distance is 10+F meters. When only the first machine is operating, the measured SPL is 70+E dB(A); when only the second machine is operating, the measured SPL is 67+D dB(A). Estimate the power level of each machine and the total power level of the garbage-compacting plant.

* LW1 dB(A) (3 points)
* LW2 dB(A) (3 points)
* LWtotal  dB(A) (3 points)

**Exercise 2 (tolerance +/- 1 dB)**

A noise screen is employed for reducing the noise coming from a railway, for a receiver which is distant 10+F m from the center of the rail track. LA,eq is equal to 70+E dB(A) before installing the noise screen. The effective height of the screen is 3+D/4 m, and it is placed at 4+C m from the center of the rail track. Supposing that the railway noise has a dominant frequency of 1500 Hz, compute the attenuation of the noise screen and the LA,eq when the screen is installed

* Noise Screen Attenuation L dB (7 points)
* LA,eq with screen dB (3 points)

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

Two rooms are separated by a wall having a surface **S**=10+E/20 m2 and a sound reduction index of the wall, R, equal to 30+F dB at 100 Hz.

In the source room, an electric transformer produces an SPL = 80+E dB at 100 Hz.

The receiving room has a volume of 60+D·4 m3, and a reverberation time of 2+C/10 s.

Compute the SPL inside the receiving room, both in dB and in dB(A).

* SPL-LIN dB (6 points)
* SPL A-weighted dB(A) (4 points)