# **­Applied Acoustics – 21 February 2020**

Name & Surname:

E

D

C

B

A

F

Matricula:

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

The traffic along a road is 900+F\*10 cars/hour and 70+E trucks/h. It is known that the SEL due to the transit of one car is 85+D dB(A) at 7.5m, and the SEL of one truck is 95+C dB(A). Compute:

* SEL of one car at 30m dB(A) (3 points)
* SEL of one truck at 30m dB(A) (3 points)
* Leq at 30m dB(A) (4 points)

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

A sample of unknown absorption coefficient is placed at the end of a standing wave tube. At the opposite end, a loudspeaker generates wide band noise. Inside the tube the following values are measured: Sound Intensity Level LI = 70+F/2 dB, Energy Density Level LD = 80+E/2 dB. Compute the following unknown quantities:

* Absorption coeff. of the sample  dB (4 points)
* SPLincident dB (3 points)
* SPLreflected dB (3 points)

**Exercise 3 (tolerance +/- 1 dB)**

A noise screen is required for reducing the noise generated by a sound source (which can be either point or line). The distance between source and receiver is 10+F m, and the screen is in the middle. The ground is 100% absorbing, and the elevation above the ground of source, receiver and barrier are respectively 0.5m, 3m and 4+E/10 m. The dominant frequency of the source is 200+D\*20 Hz. Compute:

* Fresnel number N (3 points)
* Noise reduction for a point source dB (3 points)
* Noise reduction for a line source dB (4 points)