# **­Applied Acoustics – 19 July 2019**

Name & Surname:

E

D

C

B

A

F

Matricula:

**Exercise 1 (tolerance +/- 5%)**

A piston is radiating sound at the end of a circular duct, with anechoic termination at the other end. The value of SPL inside the duct is 80+F dB. The diameter of the duct is 80+E mm. Compute:

* Sound Pressure p Pa (4 points)
* Sound Intensity I W/m2 (4 points)
* Sound Power Level dB (re 1E-12 W) (4 points)

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

S

R

1+B/10

1+B/10

10+F

An omnidirectional point source, radiating wide band noise, is located outdoors, above an absorbing ground (=0.3+F/30), at a height of 1+B/10 m. The Sound Power Level Lw is equal to 100+D dB. A microphone is located at a horizontal distance of 10+F m, at the same height of the source.

Determine the values at the microphone of the direct SPL, of the reflected SPL and calculate the total SPL.

* Direct SPL dB (4 points)
* Reflected SPL dB (4 points)
* Total SPL dB (4 points)

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

A noise screen is required for reducing the noise generated by a point-like sound source. The distance between source and receiver is 10+F m, and the screen is in the middle, with an effective height of 2+E/5 m. Compute:

* Fresnel number N (4 points)
* Noise reduction in dB at 100 Hz dB (4 points)
* Noise reduction in dB at 1000 Hz dB (4 points)