# **Applied Acoustics – 22 February 2018**

Name & Surname:

E

D

C

B

A

F

Date of Birth:

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

Inside a standing wave tube a measurement with a Sound Intensity probe is performed, and the following value is found: the difference between the Energy Density Level and the Sound Intensity Level is equal to 4+F/2 dB.

Compute the absorption coefficient of the material placed at the end of the tube and the difference between maximum and minimum values of the Sound Pressure Level which are found if a standard pressure microphone is moved along the tube.

* Absorption Coefficient **** (5 points)
* Delta SPL (max-min) dB (5 points)

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

R

C+10

S

F/10+1

10+E

An omnidirectional point source, radiating a pure tone at 1000 Hz, is located outdoors, above the partially absorbing ground (α=0.3+F/50), at an height of B/10+1 m. The Sound Power Level Lw is equal to 100+D dB.

A microphone is located at an horizontal distance of 10+E m, and at an height of C+10 m above the partially absorbing ground.

Determine the following values of the SPL at the microphone.

* Direct Sound SPL dB (5 points)
* Reflected Sound SPL dB (5 points)
* Total SPL if the two waves are   
  in phase dB (5 points)
* Total SPL if the two waves are   
  in opposite phase dB (5 points)