**Applied Acoustics - 31/10/2014 In-class test - Lecturer: Angelo Farina**

Note: some input date are based on the 6 digits of Matricula number, assigned to the 6 letters A B C D E F.

If for example the matricula is 123456, it means that A=1, B=2, C=3, etc. . Furthermore CD=34 (NOT 3x4).

**Warning: On-line compilation of this form warrants TWO additional score points.**

Top of Form

**Surname and Name**

F

E

D

C

B

A

**Matricula**

**What is the sampling rate and resolution of the soundtrack of a normal DVD-video disc? (**one answer only)

* 44100 Hz, 16 bit
* 48000 Hz, 16 bit
* 48000 Hz, 24 bit
* 96000 Hz, 24 bit
* 192000 Hz, 24 bit

**How many spectral lines are obtained by means of the FFT of a segment of waveform which is 4096-samples long?**

* 1024 **(**one answer only)
* 1025
* 2048
* 2049
* 4096

**And what is the bandwidth of each spectral line, if the sampling rate is 24000+E\*1000 Hz?**

***(****write number and measurement unit)*

**How many of these spectral lines are included in the one-octave band centered at 1 kHz?**

*(write number and measurement unit)*

**Which is better truly-pulsive source for room acoustics measurements in terms of spectral flatness, shortness in time domain and omnidirectionality? (**one answer only)

* Starter pistol
* Balloon
* Firecracker
* Clapping machine
* Loudspeaker

**Which is the better test signal for electroacoustic impulse response measurements, and why? (**one answer only)

* MLS (white), for its excellent signal/noise ratio
* MLS (pink), for its immunity to distortion
* Linear Sine Sweep, for his flat spectrum
* Exponential Sine Sweep, for his immunity to time variance and nonlinearity
* IRS, for his immunity to nonlinearity

**An exponential sine sweep is convolved with the time reversal of itself. What will be the spectral slope of the resulting signal? (**one answer only)

* Flat
* -3 dB/octave
* -6 dB/octave
* -9 dB/octave
* -12 dB/octave

**What's the best anti-leakage window to be applied before the FFT operation? (**one answer only)

* Hanning
* Hamming
* Blackmann
* Triangular
* Rectangular

**Compute the disk space required for a 4-channels recording at 48 kHz, 32 bit(float) having a lenght of 30+F\*3 minutes (***write number and measurement unit)*

**The recording of a music piece is done at 44100 Hz, 16 bit, and is long 30+E s. The recording is convolved with the impulse response of a church, which is 5+F s long. Compute the length of the convolved signal in samples**

*(write number and measurement unit)*