**Applied Acoustics – Test 5/2020 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), DE =45, EF =56.

If L =100+E\*10 the results is 100+(5\*10) = 150 (the product has precedence over the addition).

Top of Form

**Surname and Name**

F

E

D

C

B

A

**Matricula**

1. **A generic microphone is partially sensitive to sound pressure, partially sensitive to particle velocity: which are the two percentages for a CARDIOID microphone?**

*one answer only: 1 point if correct, -1 point if wrong, 0 point if "no answer"*

* 100% pressure, 0% velocity
* 75% pressure, 25% velocity
* 50% pressure, 50% velocity
* 25% pressure, 75% velocity
* 0% pressure, 100% velocity
* I do not know (no answer)

1. **What is the geometrical layout for an ORTF stereo microphone pair?**

*one answer only: 1 point if correct, -1 point if wrong, 0 point if "no answer"*

* Two coincident cardioids, angled 60°
* Two coincident cardioids, angled 90°
* Two cardioids, spaced 170mm and angled 60°
* Two cardioids, spaced 170mm and angled 110°
* Two hypercardioids, spaced 300m and angled 90°
* I do not know (no answer)

**3) How many channels are required for transporting an Ambisonics 7th-order stream?**

*one answer only: 1 point if correct, -1 point if wrong, 0 point if "no answer"*

* 9 channels
* 16 channels
* 25 channels
* 34 channels
* 64 channels
* I do not know (no answer)

**4) Which of the following playback systems provide periphonic reproduction (sound coming also from above and below)?**

*multiple answers allowed: for each answer, 1 point if correct, -1 point if wrong, 0 point if "not selected"*

* 5.1 Dolby Digital Surround (DVD disc)
* 7.1 Surround (Blue Ray Disc)
* WFS (Wavefield Synthesis)
* Ambisonics
* SPS (Spatial PCM Sampling, for example Mach1)
* Dolby Atmos (sound objects)

**5) Compute the number of channels required for an Ambisonics stream of order 5\*F.**

*write number and measurement unit*

**6) Compute the beamwidth (angle from axis at which the level drops 3dB) for a virtual cardioid microphone of order 1+E.***write number and measurement unit*

**7) Two sound sources are separated by an angle of 60+F\*3 degrees. We aim at them with two virtual cardioids of order 1+E. Compute the attenuation in dB of source B for the microphone aimed on source A.**

*write number and measurement unit*

**8) In a stereo mix, a highly-pitched sound is panned with an amplitude gain of (70+F)% on channel Left, and (30-F)% on channel Right. Assuming that the playback is occurring on a standard stereo system (with loudspeakers spaced 60° apart), find the apparent azimuth of the sound (counting from an azimuth=0° in the Center-Front).**

*write number and measurement unit*