UNIVERSITA' DEGLI STUDI
ROMA TRE
CdS in ***Biomedical Engineering***

class of
Signal Processing for Biomedical Engineering

Written test of Jan. 28th 2020. .

note: This test is valid only for registered students. Test delivery implies that previous results (if any) are canceled.

Family and first names (in all CAPITALS): _____ _____

signature: _____

Roma3 registration number: _____ or ID card number: _____

born on (day/month/year): _____ / _____ / _____

In the academic year 2019/2020 registered for the ___ year of the MS course in

_____

e-mail (write legibly): _____ @ _____

Exercises:

1. Perform a digital FIR filter h(n) of 3 coefficients according to the MSE criterion to extract the useful signal s(n), made of one sinusoid with unknown phase and normalized frequency $\omega_o = \pi/2$, from a received signal r(n)=s(n)+w(n) where w(n) is a random white signal with the same power as s(n).

2. A random series is obseved for 6 samples:

   -1 -3 5 3 -2 -1

   Perform an optimum linear predictor with one coefficient (ZOP) and numerically predict the next sample of the series. In addition, evaluate the prediction error variance.