

- a) Now compensate the existing plant you have designed without changing the initial parameters in question no. 1(a) for the following specifications: **%OS=40%** and **Ts (2%) =4 seconds**. And the compensated system should be **error free**.

From Calculation:

Damping Ratio = 0.28

Natural Frequency = 3.571 rad/s

K= 12.755

New Pole = 1.9998

R1 = 343.64 K $\Omega$

R2 = 42.034 K $\Omega$

R3 = 50 K $\Omega$

R4 = 100 K $\Omega$

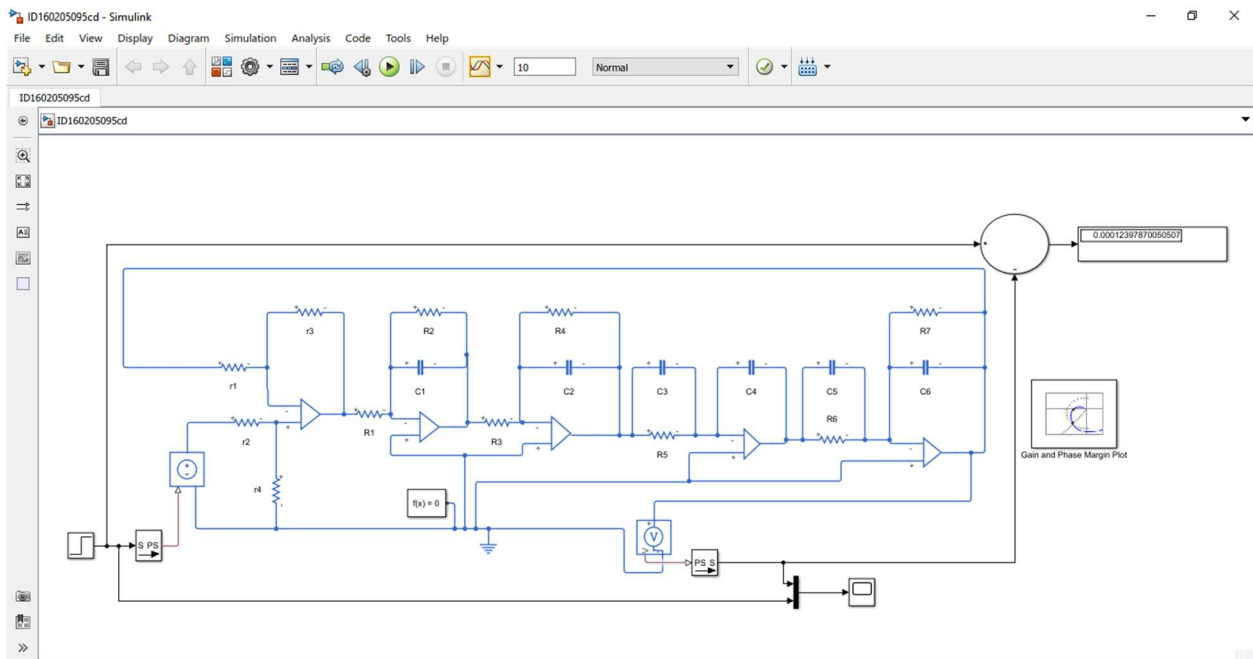
R5 = 42.034 K $\Omega$

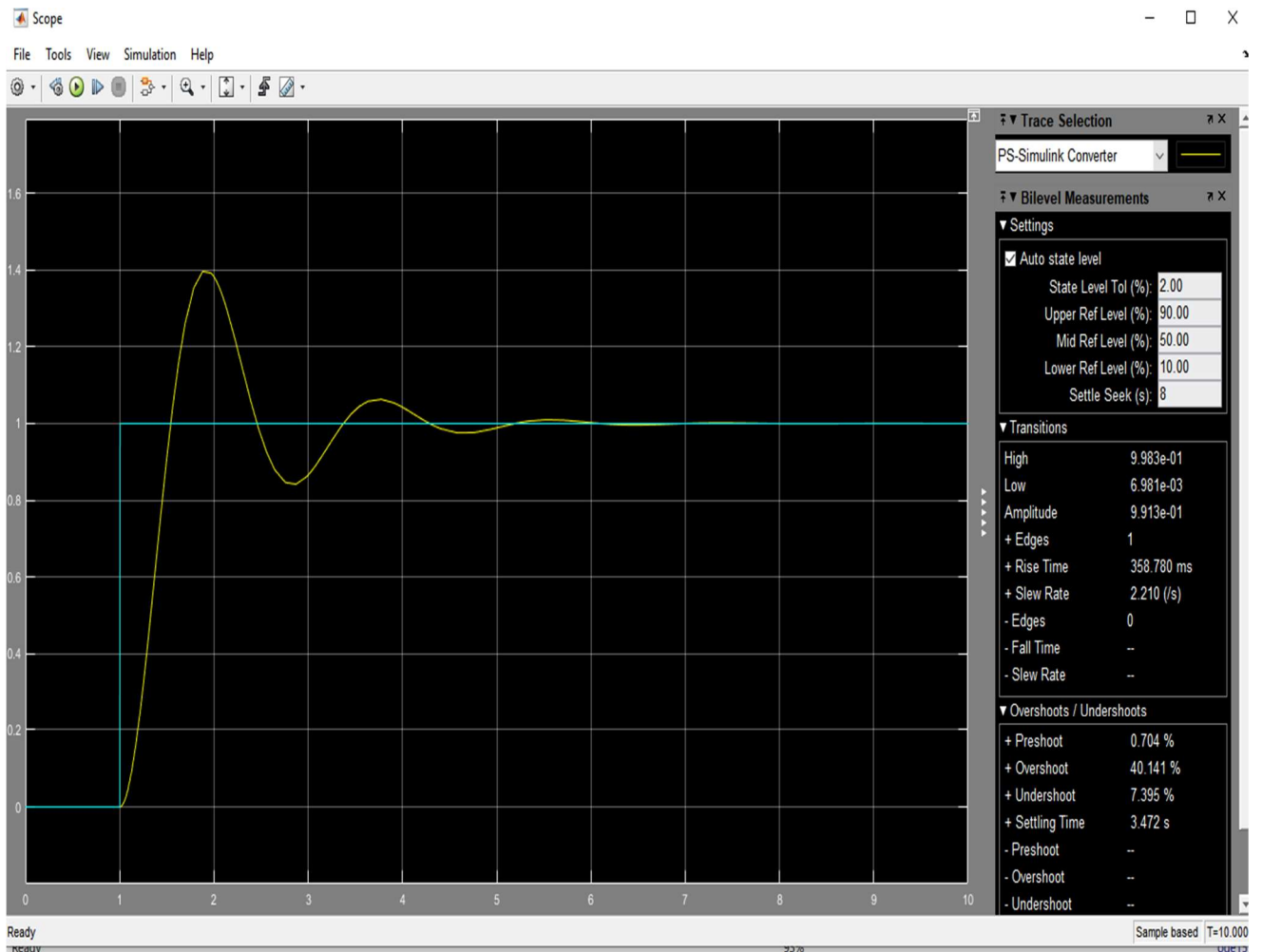
R6 = 7.84 K $\Omega$

R9 = 343.64 K $\Omega$

C = 10  $\mu$ F

So the Desired Design :





- b) Show the **open loop Nyquist plot** for the aforementioned system and specify all the stability margins in the same Simulink model for question no. 1(c).

