Quiz # 4, EE250 (Control System Analysis), Spring 2012*

DEPARTMENT OF ELECTRICAL ENGINEERING, IIT KANPUR

Name: **Roll No.:** **Section:**

A

Consider the transfer function (TF) $10/(s+10)$.

1. **[1 points]** Convert the TF into a state-space equation using the simulation diagram approach learned in the lectures.

2. **[1 points]** In how many time constants does the unit step response of this TF enter the 2% tube?

3. **[1 points]** Discretize this state-space equation using Euler's approximation with a step size of numerical integration equal to T.

4. **[1 points]** For what value of T does the discretized equation lose stability?

5. **[1 points]** From your experience with the m-file `ta08p3.m`, what should the value of T be for the numerical integration of the above continuous-time state-space equation to be completed in as few steps as possible, while the solution of this numerical integration is a good approximation to the closed-form solution of the continuous-time equation?

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