EE380 (Control Systems) Lab work of Experiment 4.

Student Name	Roll No.	Bench No.

Q1. Write a code to apply a step input to the motor. Run the setup in OL mode. Identify the system parameters K_m and τ_m by using the OL step response.

Q2 If K_m and τ_m are different from those you saw in Experiment 1, calculate the values of R_Σ and B as you did in Q1.

Else, in the following, use the R_Σ determined at home.

Q3 Control the motor in the following ways:

Q3.1 Using feedback of speed (as in Experiment 1).

Q3.2 Using feedback of current with $\hat{\omega} = \frac{u - R_\Sigma i_{sens}}{K_b}$, and

Q3.3 Using feedback of current with $\hat{\omega} = \frac{u - R_\Sigma \hat{\imath}}{K_b}$, where,

$\hat{\imath} = \frac{1}{1.8} i_{sens} - \frac{1}{30}$.

Q3.4 Using feedback of current with $\hat{\omega} = \frac{u - R_\Sigma \hat{\imath}}{K_b}$, where,

$\hat{\imath} = 2.5 i_{sens}$.

In each of the above cases, plot ω vs. t and $\hat{\omega}$ vs. t as subplots on figure, and ω vs. t and u vs. t as subplots on another figure. That is, you will show us two figures for each of Q3.2 through Q3.4.

In the control of motor speed, is the feedback of armature current an adequate substitute for the feedback of motor speed?