EE380 (Control Systems) Lab work of Experiment 5.

Student Name	Roll No.	Bench No.

Verify that your experimental setup is connected as shown in Figure 5.3. With the lead from the sensing resistor R_s connected to CN4 input pin 1. **The power supply needs to output 15 V for this experiment.**

Uncomment the following parts of `main-prog.c`
 	
``
// IV = AD_value(); // Read voltage across Rs=4.7ohm.
// IV = 5*(511 + IV)/1022; // Convert signed to unsigned.
``
 	
and
 	
``
// Is = IV/4.7;   // Convert voltage to current.
// IF = (1-5.0*T)*IF + 5.0*T*Is; // Low-pass filter.
``

There are other parts of `main-prog.c` that you will uncomment at your discretion.

Q8 Write the discretized version of the home-designed I controller into `main-prog.c` and below. **Note:** *You are free to explore the P and PI controllers too.*

Q9 Under the feedback control of Q8, obtain the plots of u and i vs. t for the below 2 cases.

Q9.a $i_d = i_{d1}$ without any load on the motor. Immediately after the motor shaft seems to be rotating at constant speed, hold the shaft tightly for about 2 s and release to see how well this control system rejects the disturbance.

Q	Var	Plot (versus t)	
Q9.a	i		$t_s =$
Q9.a	u		Max. $u =$

Q9.b $i_d = i_{d2}$. Use the lab-provided load. The motor needs to see the load $t = 0$ onwards.

Q	Var	Plot (versus t)	
Q9.b	i		$t_s =$
Q9.b	u		Max. $u =$

Q10 Are you satisfied with the disturbance rejection in Q9.a? Explain.

Q11 Write down the part of the C code that you wrote for this experiment.

You will use this code in the experiment on disturbance observer.