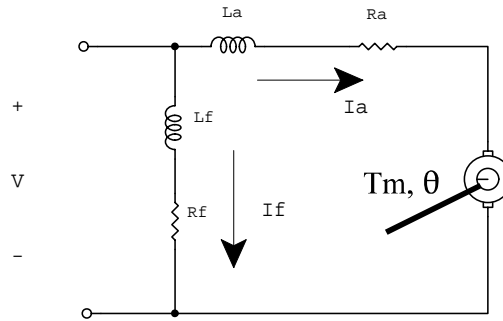


# EE 380 Control Engineering I, HW-1

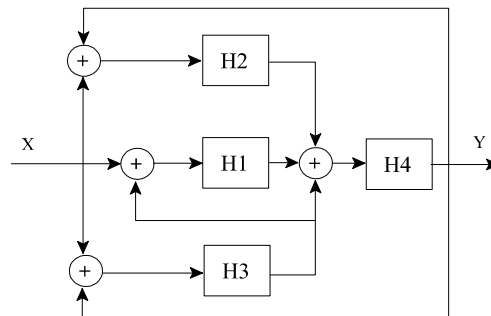
Q1:



A DC motor may be placed in a shunt configuration by connecting the field winding in parallel with the armature winding as shown in the above figure.

1- Derive the block diagram (BD) model of the motor when the input is  $V$  and the output is  $\theta$ . Show all the mathematical quantities needed to describe the BD.

2- Implement the model using Matlab-Simulink and obtain the speed - time plot when the input is unit step.



Q2: Use the block diagram reduction method to find the equivalent transfer function of the above block diagram.

Q3: Use the signal flow graph method to find the equivalent transfer function of the above block diagram