Lab Session 6
(4-8 March 2024)

Objectives:

On Simulink, perform the following activities:

1. In the simulink workspace, select the following components from the library: DC machine, DC Power Supply, Scope, Display, Sum, Step, Bus Selector, Gain and Powergui.
2. Select the preset model provided in the DC machine. [*Example:* 01 5HP 240V 1750RPM Field: 300V]
3. Connect DC power supply to Field and Armature windings. [Note: The value of DC voltage should be same as mentioned in the preset model of the DC machine]
4. To the Load Torque ($\tau_{\square}$) input marked as 'TL' in the DC machine, provide the variable load torque between No-Load Torque ($\tau_{\square\square} = 0$) to Full-Load Torque ($\tau_{\square\square} = \frac{\square_{\square\square\square h}}{\square_{\square}}$) using the components 'Step' and 'Sum'.
5. Now, connecting Bus Selector to the machine output marked as '*m*', observe the following parameters on the Scope & Display:
   (i) Speed $\omega_{\square}$ (rad/s) [Use $\square\square\square\square = \frac{60}{2\square}$ to convert the speed $\omega_{\square}$ into RPM]
   (ii) Electrical Torque $\tau_{\square}$ (N-m)
   (iii) Armature Current I_A (A)
   (iv) Field Current I_F (A)
6. Report the observations.
7. Plot the speed-torque ($\omega_{\square}$- $\square_{\square}$) characteristics of the DC machine.
8. Is there any difference in the values of $\tau_{\square}$ and $\tau_{\square}$.