

## Lab Session 06

### Exercise:

#### Question 1:

Create a Simulink model for a DC motor with following parameters,

$$\begin{aligned} J &= 10 \\ b &= 5 \\ R &= 5 \\ L &= 0.01 \\ K &= 1 \end{aligned}$$

Find the step response of the angular speed of the motor using Simulink model. Export simulation time and angular speed of the motor to workspace using To Workspace block present in the Simulink library. Plot the step response of the angular speed of the motor by using plot command and find the time constant of graph using data cursor. Comment on why the time constant of the angular speed curve is approximately equal to the mechanical time constant.

*Write only comments below this line. Attach properly cropped image of simulink model with this document along with graph.*

### COMMENTS:

As we know that mechanical time constant is the time required for a given motor to reach 63.2% of its maximum rated speed in a no-load condition. So if we find at a point of 0.025 on y-axis (Angular velocity) which is 63.2% of the output of step response we can find mechanical time constant and this constant basically measures a motor's responsiveness.



# SIMULINK MODEL



