Simulation of the given transfer function by assuming some initial conditions

Lets suppose the parameters as following in the transfer function of the given problem:

m=1kg;
M=10kg;
l=1.5m;
J_o=2.5 kgm^2;
g=9.8m/s;

Now we will open the Simulink in MATLAB and simulate our results by passing a sine wave through it. The Simulink model of the given transfer function will look like this:

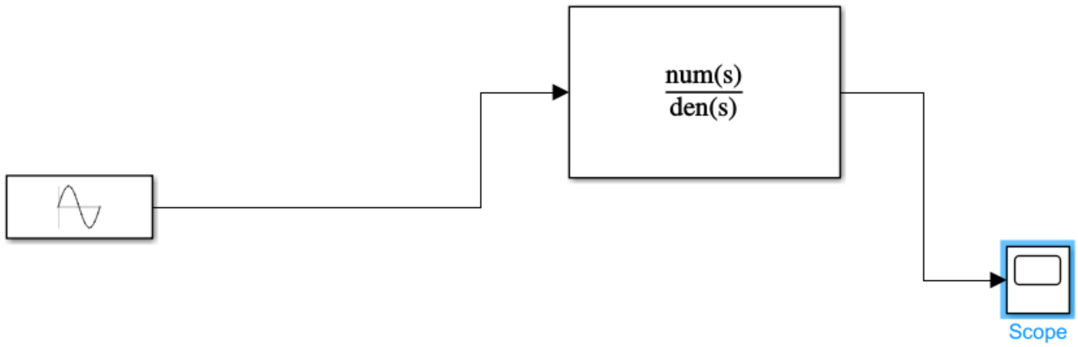

Figure 1.1(Illustrating the simulink model)

After some calculations the frequency of the pendulum is said to be 2.661 rad/s putting that in sin wave generator and plotting out the results yield the following graph:

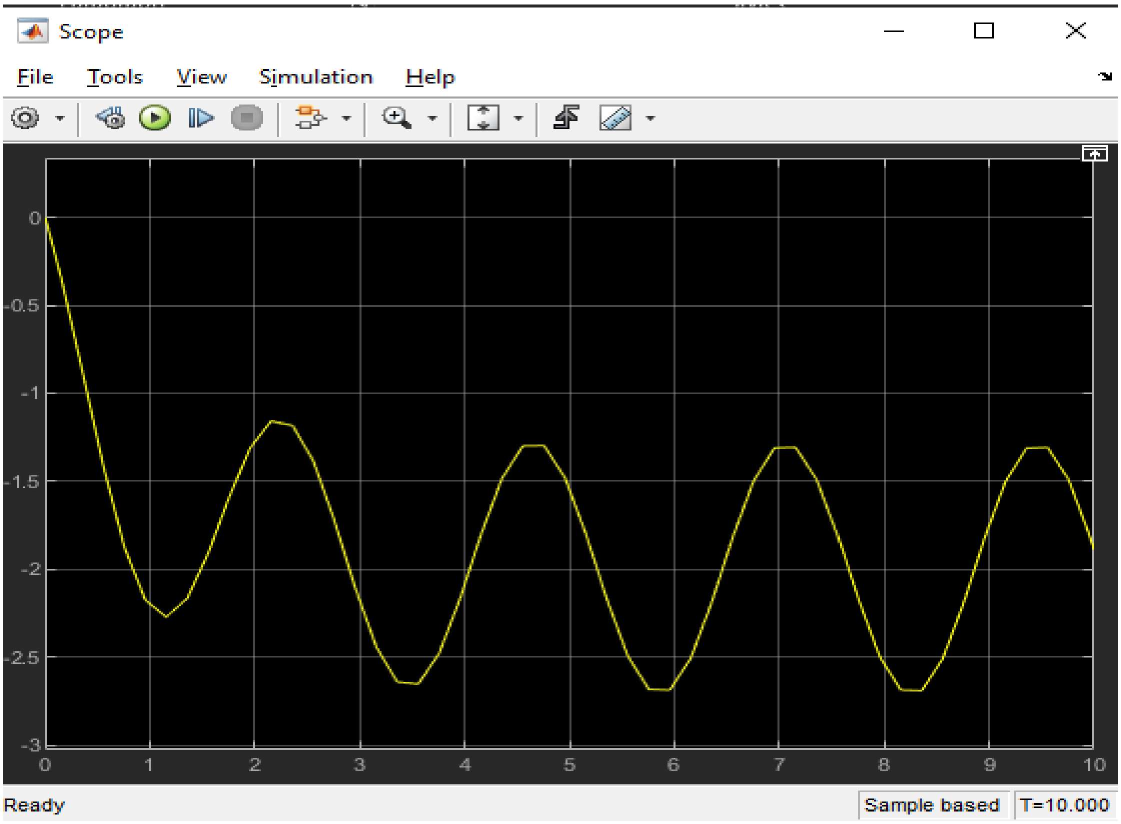

Figure 2.2 (illustrating the graph on simulink)

Discussion:

1. I calculated the transfer function of the given problem to be as:

2. Then I put some assumptions and took those assumptions into work in MATLAB IDE and then used Simulink to **generate** the **behavior** of the function.
3. As already stated in the problem that the pendulum is on a motor driven cart and is **unstable** and can fall anywhere our **graph illustrated** that unstable behavior over time which is the prove that the calculated laplace transform was in fact **correct.**