Model a two-spring mass damper system in Simulink according to the following problem statement.

Consider the following two mass-spring-damper system:

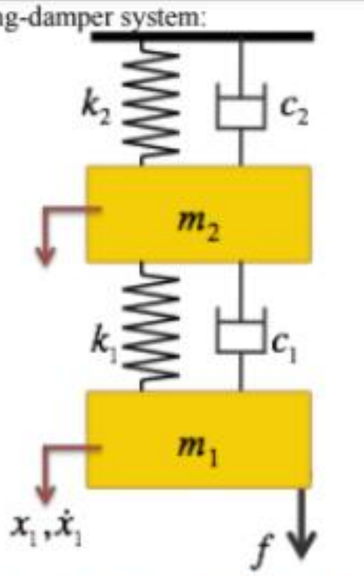

Figure 1 - System for Problem 2

The equations of motions for the system shown in Figure 1 are:

$$m_1\ddot{x}_1 + c_1\dot{x}_1 + k_1x_1 - c_1\dot{x}_2 - k_1x_2 = f$$
$$m_2\ddot{x}_2 + (c_1 + c_2)\dot{x}_2 + (k_1 + k_2)x_2 - c_1\dot{x}_1 - k_1x_1 = 0$$

a) Implement the system of equations above in Simulink using the following parameters:

```
m1 = 10;      % Mass 1 [kg]
m2 = 100;     % Mass 2 [kg]
c1 = 100;     % Damping Coefficient 1 [Ns/m]
c2 = 1000;    % Damping Coefficient 2 [Ns/m]
k1 = 1e4;     % Spring Coefficient 1 [N/m]
k2 = 1e5;     % Spring Coefficient 2 [N/m]

Tend = 10;    % Simulation Stop Time [s]
```

You can assume that the initial conditions are all zero.

Define the model parameters in a separate .m file and use the ode45 Solver. Make sure to decrease the maximum step size if the plots are not smooth.

b) Simulate the response of the system assuming that $f(t)$ is a step function of magnitude 5 N. Plot the response of the systems (the two positions $x_1(t)$ and $x_2(t)$) in two separate figures.

c) Simulate the response of the system assuming that $f(t)$ is a sinusoidal function: $f(t) = 3\sin(10t)$. Plot the response of the systems (the two positions $x_1(t)$ and $x_2(t)$) in two separate figures.