

Lab Session 02**Exercise:****Question 1:**

Obtain the state space representation for the system shown below. Solve the resulting state equations using MATLAB *ode45* function (write complete script). Plot the position $x(t)$ and velocity $v(t)$ of the system with respect to time for $t = 0$ to 50 sec considering the following cases and write in your words about what you observed by looking at different plots. (Attach plot under each case).

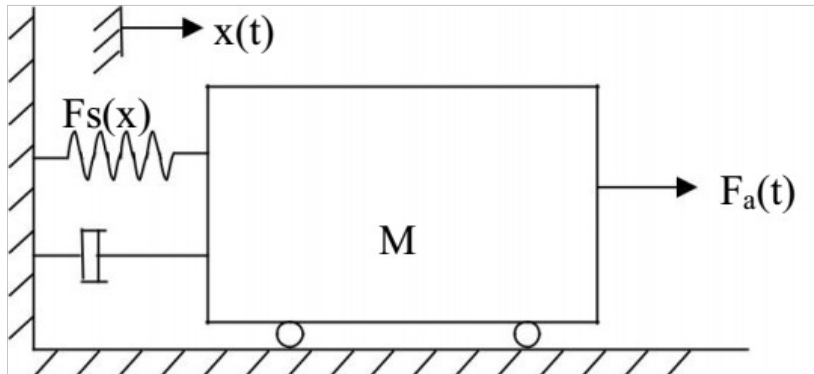
[Use separate A4 sheets for plots and attach it with this document]

Behavior upon changing Mass (M)			
<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>	<u>Case 4</u>
M = 10	M = 30	M = 50	M = 100
B = 30	B = 30	B = 30	B = 30
K = 15	K = 15	K = 15	K = 15
Fa = 300	Fa = 300	Fa = 300	Fa = 300

Behavior upon changing Friction Coefficient (B)			
<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>	<u>Case 4</u>
M = 10	M = 10	M = 10	M = 10
B = 5	B = 10	B = 20	B = 30
K = 15	K = 15	K = 15	K = 15
Fa = 300	Fa = 300	Fa = 300	Fa = 300

Behavior upon changing Stiffness (K)			
<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>	<u>Case 4</u>
M = 10	M = 10	M = 10	M = 10
B = 5	B = 5	B = 5	B = 5
K = 0.5	K = 5	K = 20	K = 30
Fa = 300	Fa = 300	Fa = 300	Fa = 300

Behavior upon changing Applied Force (Fa)			
<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>	<u>Case 4</u>
M = 10	M = 10	M = 10	M = 10
B = 5	B = 5	B = 5	B = 5
K = 15	K = 15	K = 15	K = 15
Fa = 50	Fa = 100	Fa = 200	Fa = 300



Write your answers below this line

