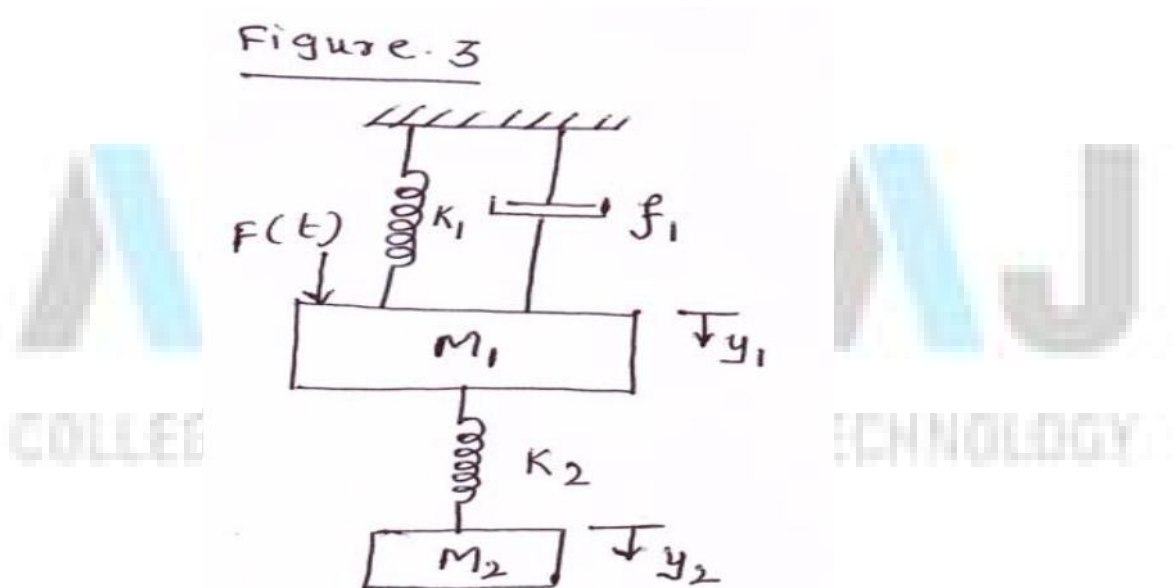


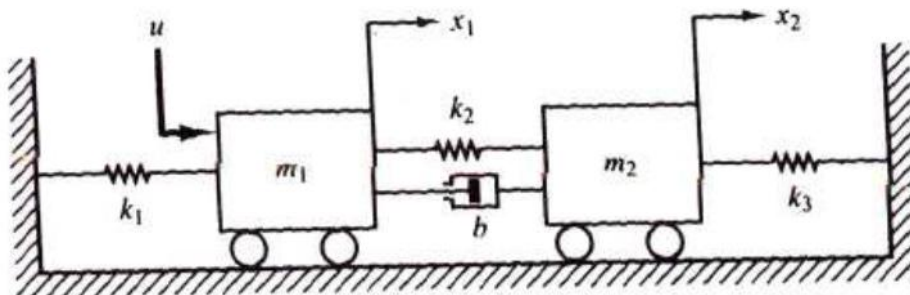
ASSIGNMENT 2

MATHEMATICAL MODELING OF DYNAMIC SYSTEMS

- (1) For a RLC circuit, derive the state model of the system.
- (2) Draw the equivalent mechanical system for the given system as per figure. Hence write a set of equilibrium equations and obtain electrical analogous circuit using (1) F-I analogy (2) F-V analogy.

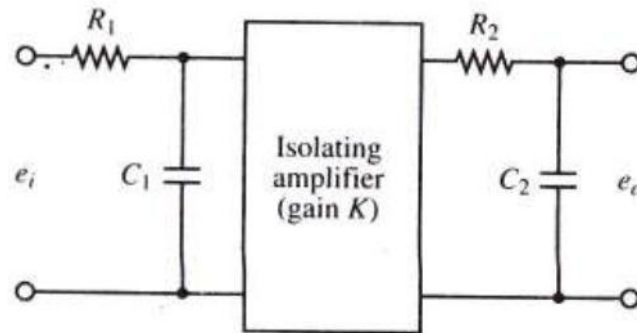


- (3) Obtain the transfer function $X_2(s)/U(s)$ of the mechanical system shown in figure.



- (4) Write a note on gear train.

(5) Find the transfer function of the given network

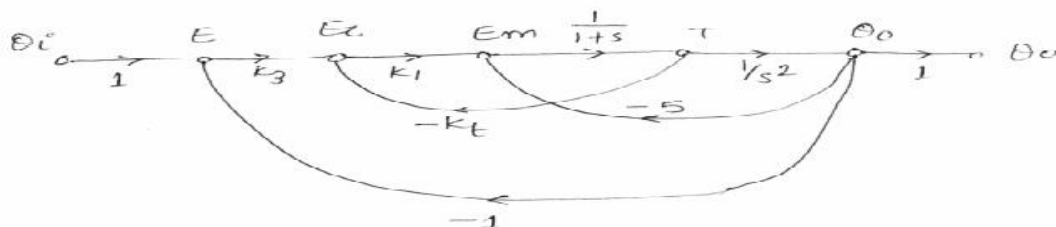


(6) Explain the concept of linearity and time invariance in the context of control systems. Give definition of transfer function and explain the same.

(7) Obtain mathematical model for one mechanical system and one electrical system. Obtain their transfer functions.

(8) Explain with suitable example, one method for linearization of nonlinear mathematical model.

(9) A servo system is represented by the signal flow graph shown in fig.3, the variable T is Torque and E as error. Determine The overall transfer function if $K_1 = 1$, $K_2 = 2$ and $K_3 = 5$.



(10) What is analogous system? Explain Force-Voltage and Force-Current Analogy With suitable Example

(11) Find Transfer Function of given network in Figure-3.

