

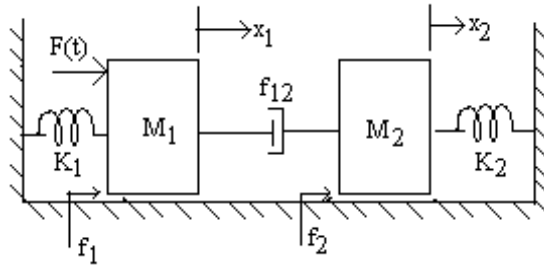
III B.Tech II Semester Supplementary Examinations, January 2005
CONTROL SYSTEM COMPONENTS
(Electronics & Control Engineering)

Time: 3 hours

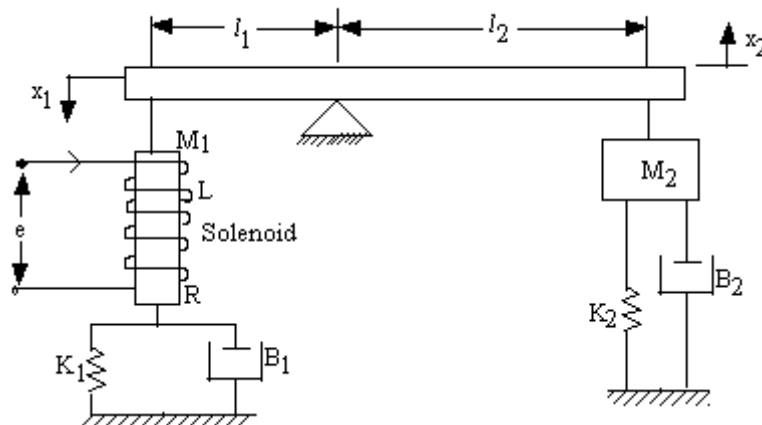
Max Marks: 70

Answer any FIVE Questions
 All Questions carry equal marks

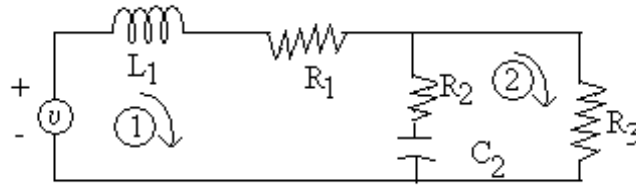
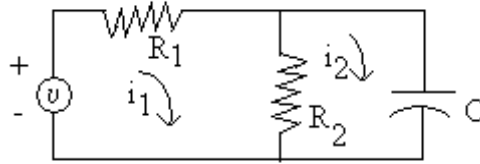
1. (a) Explain the Pivots and bearings.
 (b) Write the differential equations for the mechanical system shown below.



2. (a) Explain the pneumatic relays and write its relevant equations to describe the mathematical model.
 (b) Explain the Flapper nozzle and bellows.
3. An electromagnetic actuator contains a solenoid which produces a magnetic force proportional to the current in the coil, $f = K_i i$. The coil has resistance and inductance. Write the differential equations of performance and derive the transfer function $\frac{x_1(s)}{E(s)}$.



4. Write down the differential equation for the following networks given below. Find the transfer function of each network.
5. (a) With suitable diagrams explain the wall attachment phenomena and bistable fluidic amplifiers (flop-flops).



- (b) Derive the transfer function of AC servomotors.
6. (a) Explain the principle of UJT and Traic.
(b) Explain the applications of IC-741 and 555.
7. (a) Explain the principle of operation of optoelectronic devices.
(b) Explain the optical filters.
8. Write short notes on the following:
- (a) Stepper motors
 - (b) FETs
 - (c) Beam splitters.
