

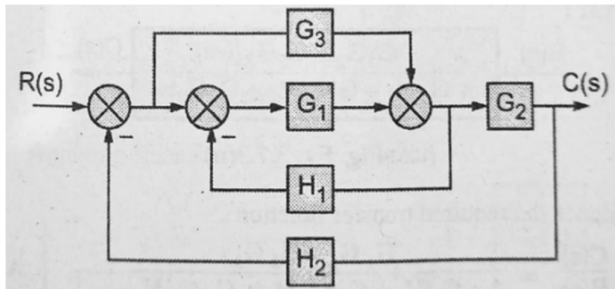
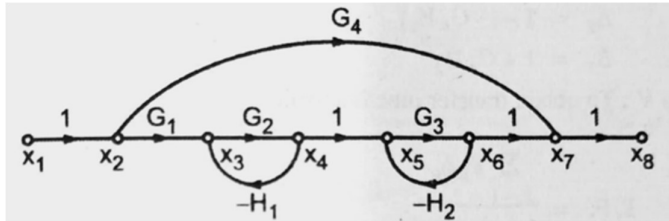
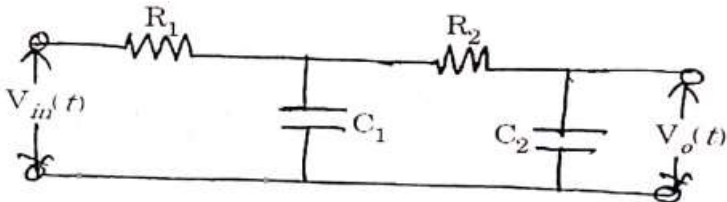
Sinhgad College of Engineering

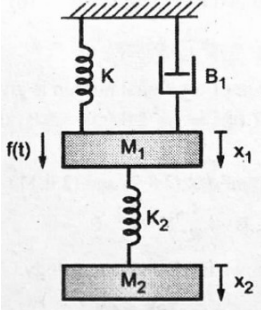
Department of Electronics and Telecommunication Engineering

SE E&TC(2019 Pattern) , SEM II

Question bank for Test 1 only

Subject: Control Systems

Que. No.	Question	Marks	CO	BTL
Q 1.(a)	Explain in detail the rules of Block diagram reduction technique with neat diagram.	8	1	R, U
(b)	For the given block diagram find the transfer function $C(s) / R(s)$ 	7	1	U
Q 2.(a)	Explain Mason's gain formula to derive Transfer Function from Signal Flow Graph.	8	1	R, U
(b)	For the signal flow graph find the transfer function using Mason's gain formula 	7	1	U
Q 3. (a)	Explain F to V and F to I analogy in mathematical modeling with suitable example.	8	1	R
(b)	Find the transfer function $V_o(s)/V_{in}(s)$ for the system shown in fig 	7	1	U
Q 4.(a)	Explain open loop and closed loop control systems with examples and also mention important points of comparison between them.	8	1	R, U

(b)	 <p>For the mechanical system shown in Fig. Draw the mechanical equivalent diagram and differential equation of system and Draw F-V analogy.</p>	7	1	U
Q 5.(a)	Explain the response of first order system to unit ramp input.	8	2	U
(b)	A feedback system is described by the following transfer function $G(s) = \frac{16}{s^2 + 4s + 16}$; $H(s) = Ks$, The damping factor of the system is 0.8, obtain the overshoot of the system and value of K.	7	2	An
Q 6.(a)	Sketch the transient response of second order underdamped system for Unit Step input. Define all time response specifications.	8	2	R, U
(b)	Second order system is given by $\frac{C(s)}{R(s)} = \frac{25}{s^2 + 6s + 25}$; calculate rise time, peak time, peak overshoot, settling time if subjected to unit step input.	7	2	An
Q 7.(a)	Derive the expression for steady state error $e_{ss}(t)$	8	2	U, An
(b)	The open loop transfer function of unity feedback system is given by $G(s) = \frac{50}{(1+0.5s)(s+10)}$; calculate the static error coefficients K_p , K_v , and K_a	7	2	An
Q 8.(a)	Give value of static error coefficients for Type 0, Type 1 and Type 2 systems.	8	2	U, An
(b)	A unity feedback system is represented by $G(s) = \frac{1000(s+6)}{(s+7)(s+10)}$; calculate K_p , K_v and K_a . Find steady state error for the input $2+6t$	7	2	An