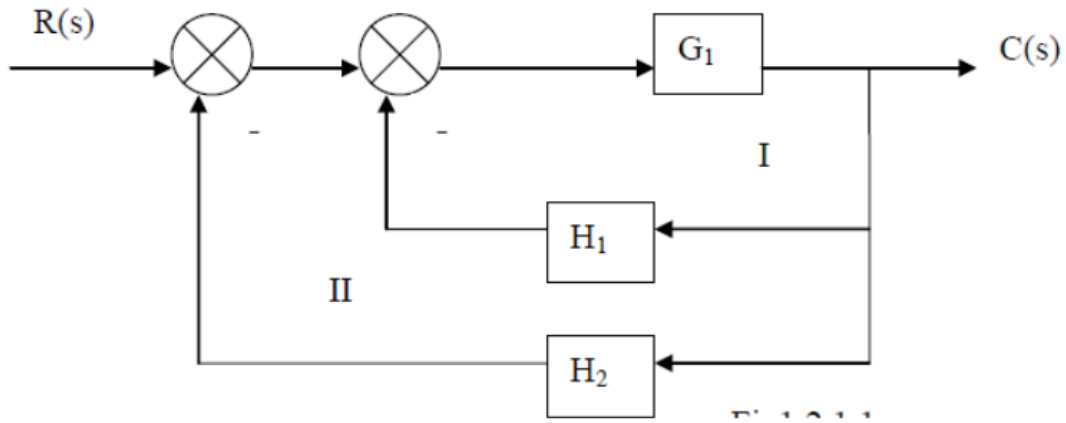
CSE461

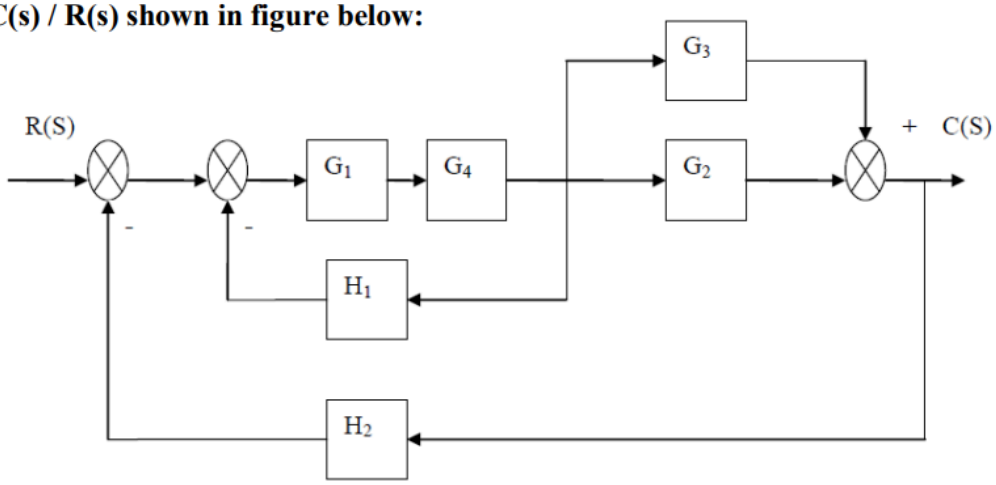
Chapter 3: Control Theory Practice sheet

Q1.



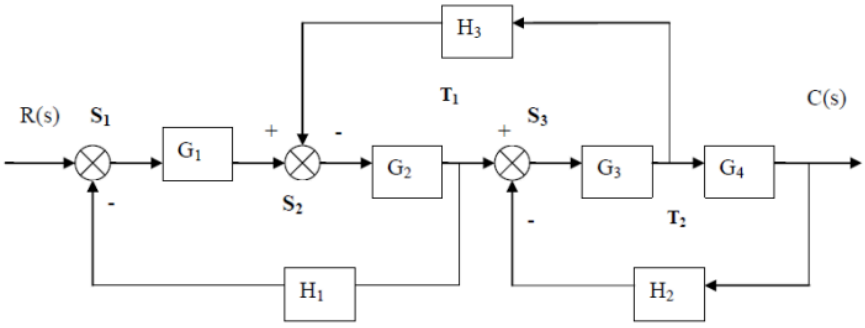
Q2.

Ex: Using block diagram reduction technique find closed loop transfer function C(s) / R(s) shown in figure below:

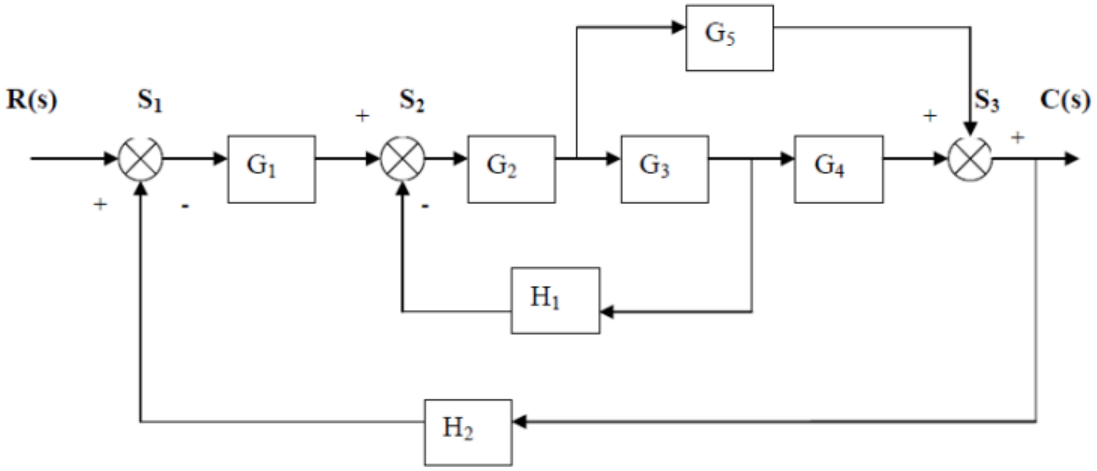


Q3.

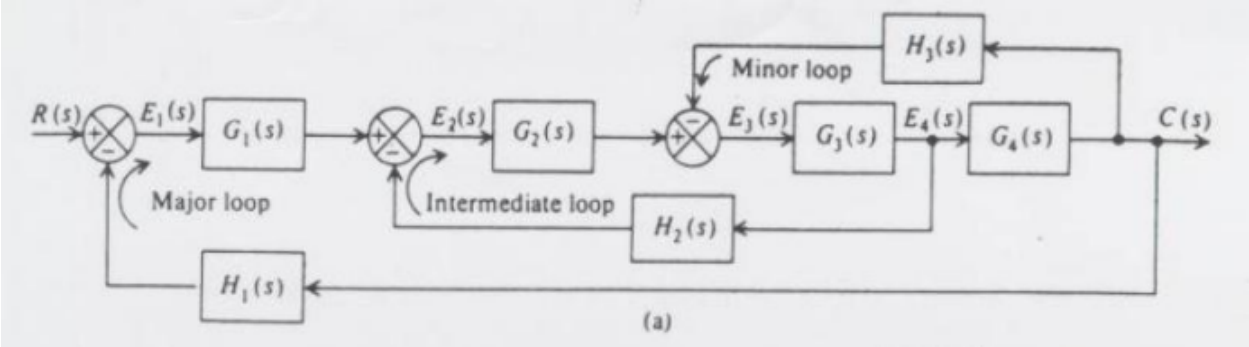
Ex: Determine the transfer function C(s) / R(s) of the system shown in Figure below by block diagram reduction method.



Q4.

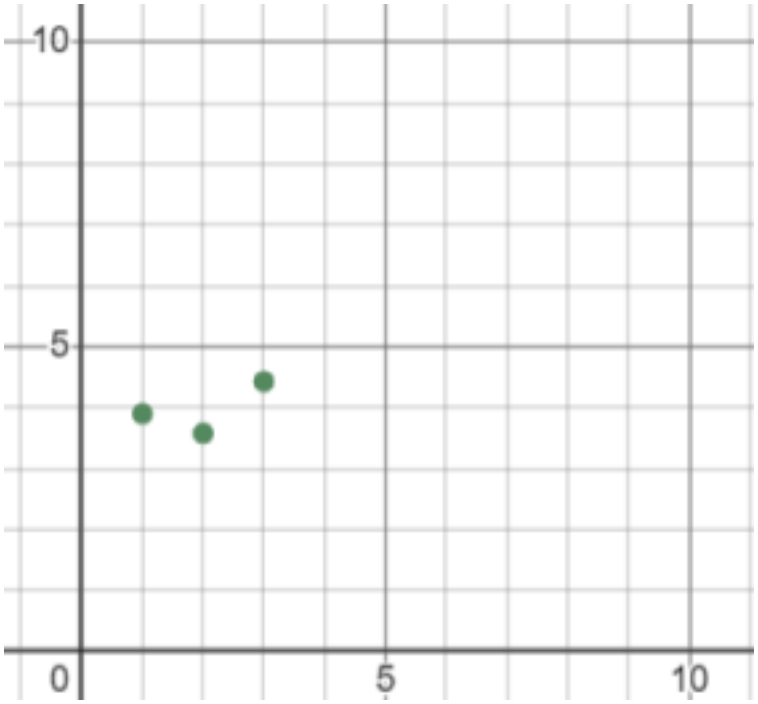


Q5.



Q6.

You are trying to control the rotational speed of a motor by using a PI controller. The goal of the controller is to maintain 10 rotation/s. You have measured the resulting gain and oscillation period of the system 0.6 and 10 respectively.
[error, e = required value - actual value]
Here the vertical axis represents the speed value of the motor and the horizontal axis represents the steps.



a. Calculate value of the Kp and Ki parameters of the given controller. [2] b. In the given diagram, speed values of the first three steps are given in the vertical axis by using the calculated parameters, and simulate the next three speed values of the motor step by step. You can plot on the question paper but the calculations should be shown in your answer script. [6]