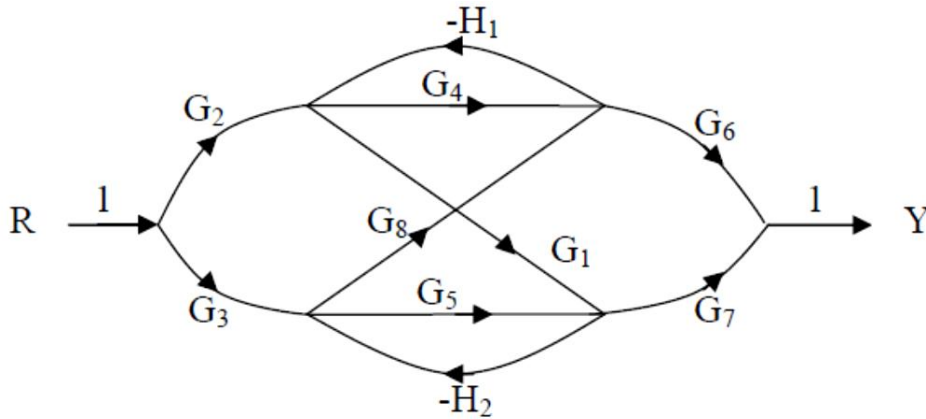
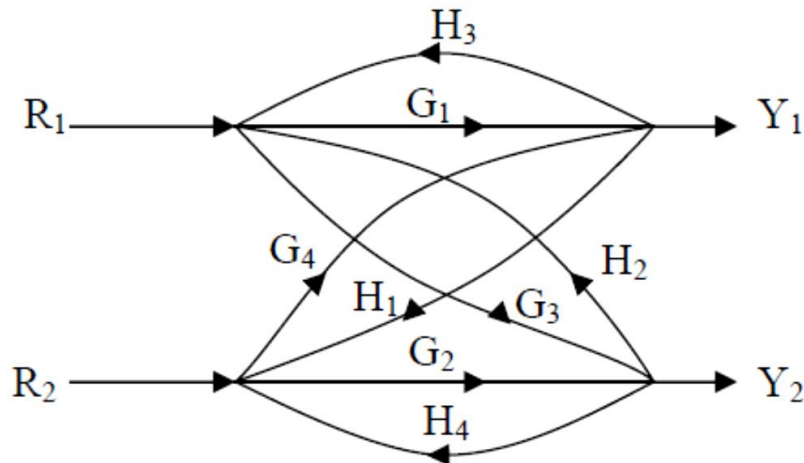


Sheet(4): Signal Flow Graph

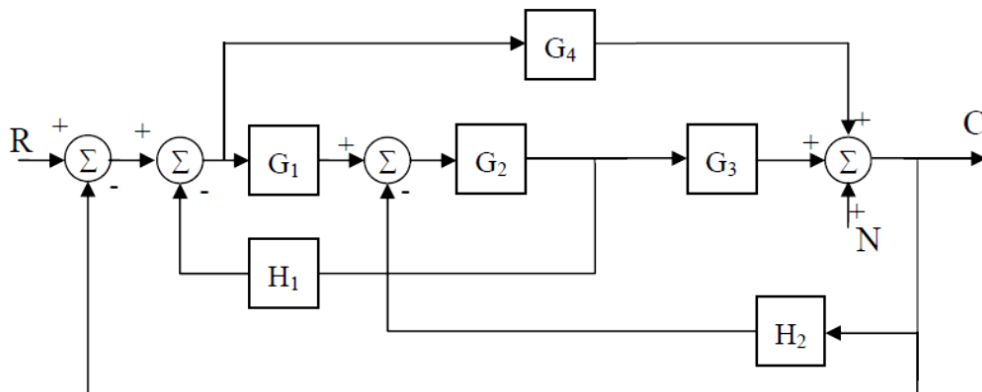
1. From the shown SFG obtain the TF of the system Y/R .



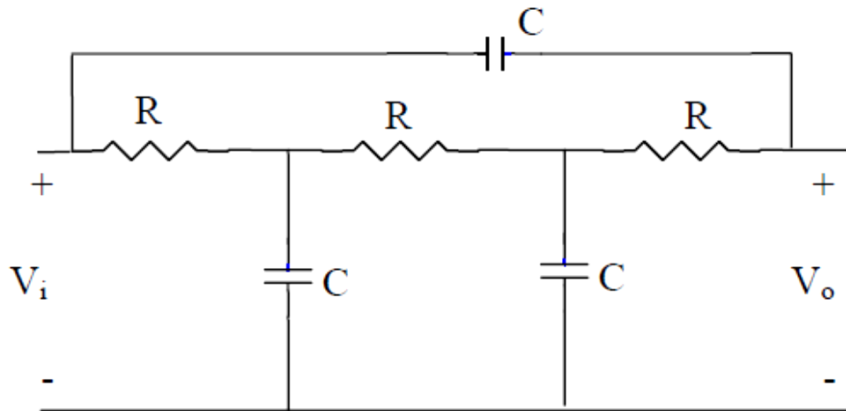
2. The shown figure gives the SFG of a MIMO system with two inputs and two outputs. Find expressions for the outputs Y_1, Y_2 in terms of the inputs R_1, R_2 .



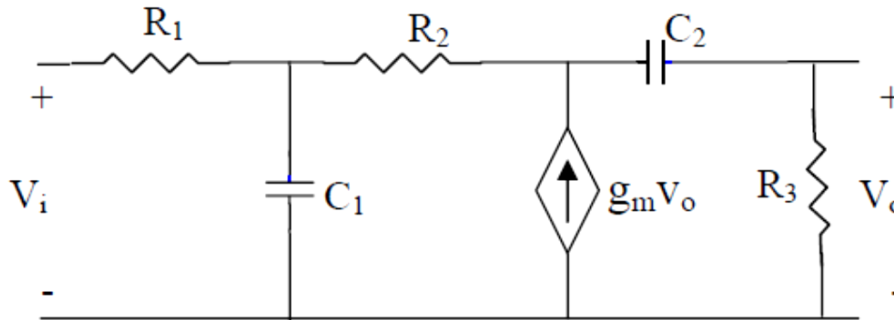
3. Construct an equivalent SFG for the shown block diagram then
 a. Evaluate the transfer function C/R .
 b. Determine the relation among the transfer functions $G_1, G_2, G_3, G_4, H_1,$ and H_2 so that the output C is not affected by the disturbance signal N .



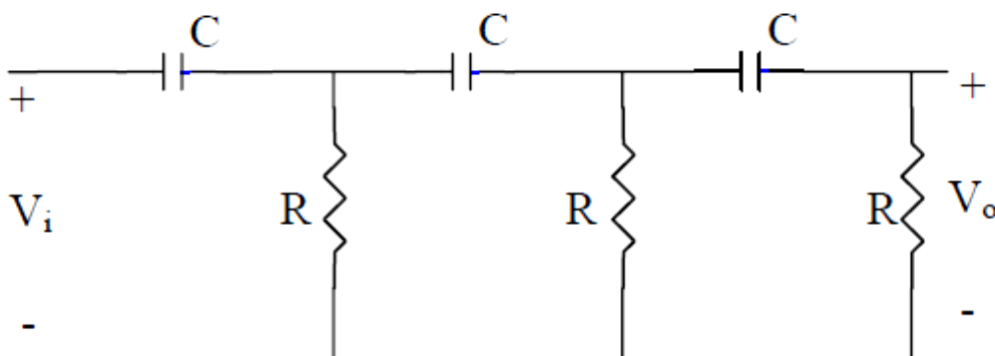
4. For the shown circuit find the TF using SFG.



5. Construct the SFG representing the shown circuit. Hence, find V_o/V_i . Then find the value of g_m that makes V_o/V_i independent of R_2 and find V_o/V_i at this value of g_m .



6. For the shown circuit determine
 a. V_o/V_i using SFG method.
 b. The frequency at which V_o/V_i is real.
 c. $|V_o/V_i|$ at the frequency obtained in part b.



7. For the control system represented by the following block diagram, where $U(s)$ and $F(s)$ are the system inputs and $P(s)$ is the system output:
- Draw the signal flow graph for the system.
 - From the graph find the transfer functions: $P(s)/U(s)$ and $P(s)/F(s)$.

