

Time: 1 Hour 30 Minutes

Max Marks : 30

- Note: 1. Answer all questions.
2. Symbols and notations carry their usual meanings.
3. Assume missing data, if any.

1. Obtain the transfer function C/R for the system shown in Fig. 1 using rules of block diagram algebra. 6
2. Obtain the transfer function C/R for the signal flow graph shown in Fig. 2. using Mason's Gain Formula. 6
3. Compare negative feedback systems and non feedback systems in terms of:
 - i. Sensitivity to variations in parameter values of forward and feedback path elements 6
 - ii. Control over system dynamics 6
4. The open loop transfer function of a unity feedback system is $\omega_n^2/[s(s+2\xi\omega_n)]$. Find its response to unit step input. 6
5. For the mechanical System shown in Fig.3.
 - (i) Write the equations of motion in terms of given mechanical quantities. 6
 - (ii) Draw the f-v analogous electrical circuit. 6

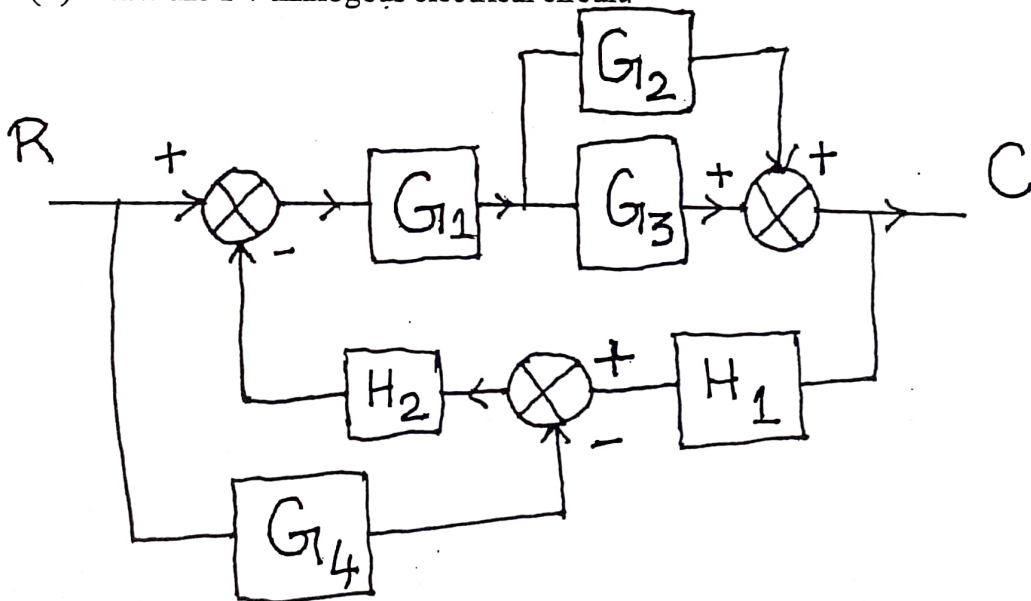


FIG. 1.

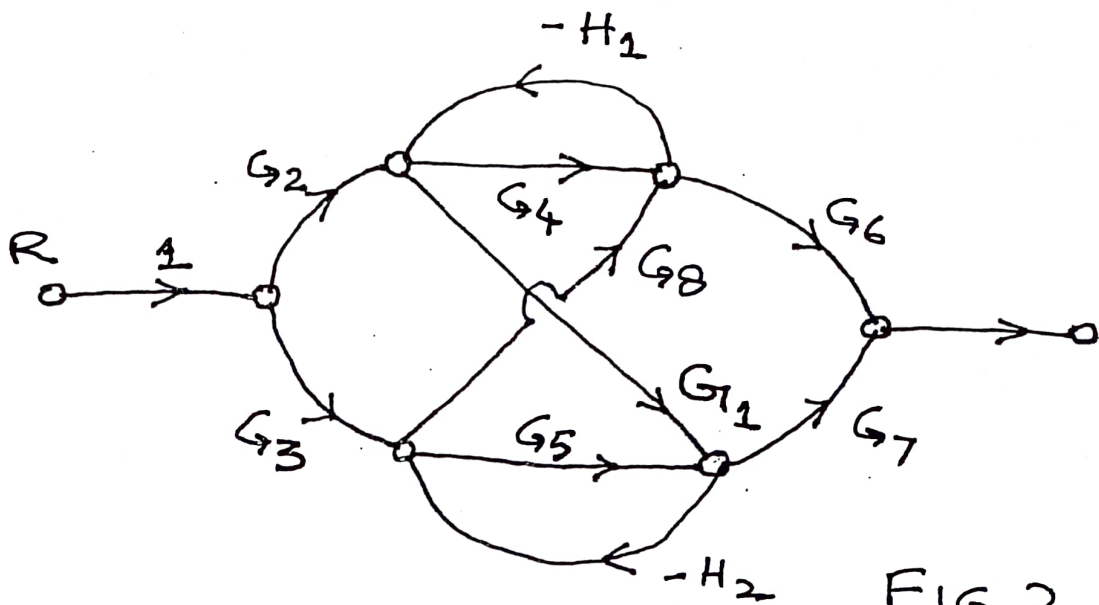


FIG. 2.

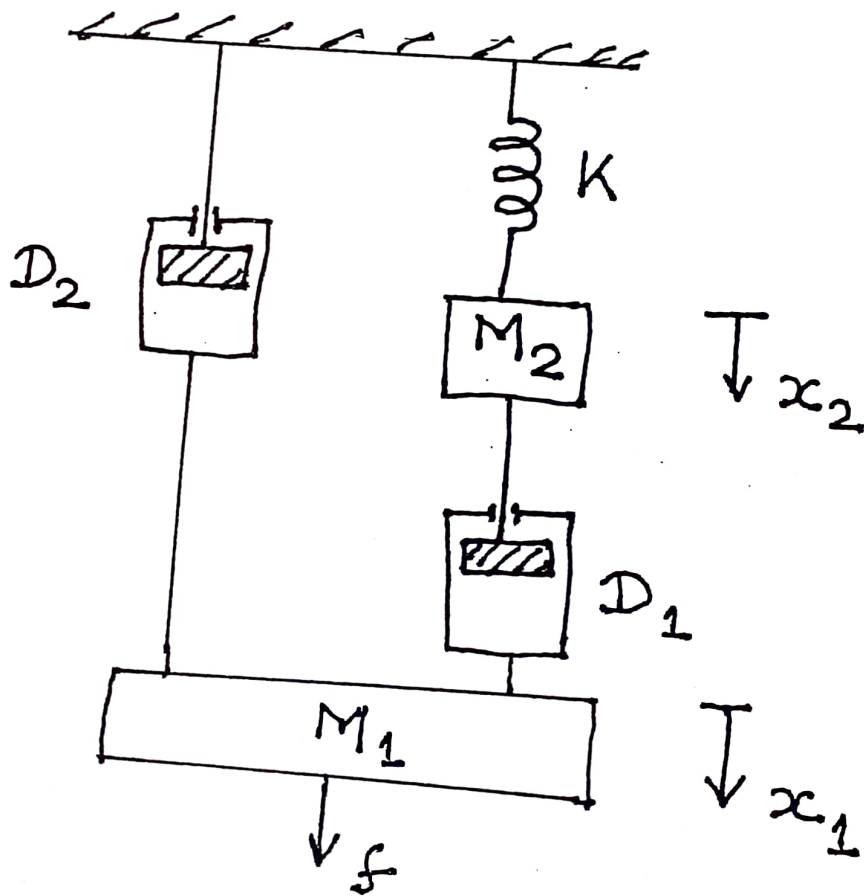


FIG. 3.