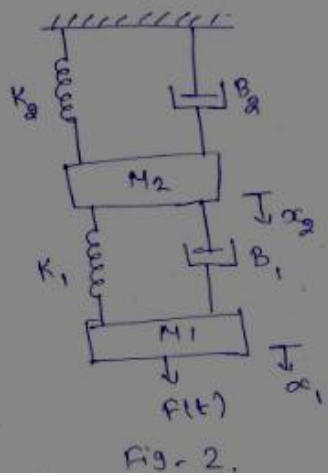
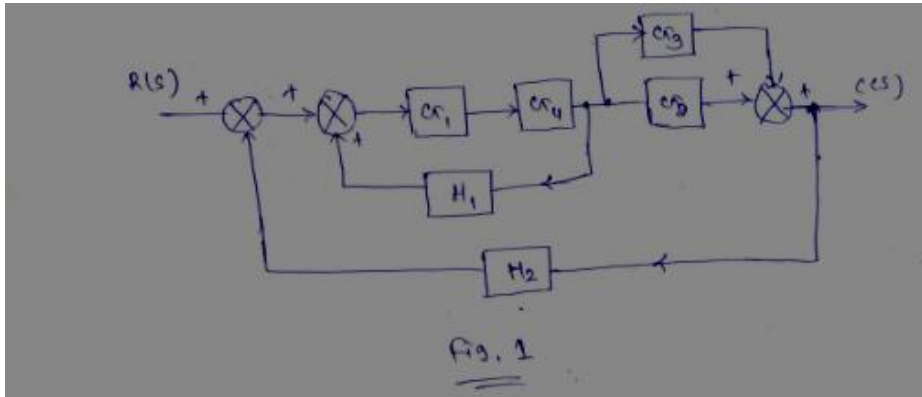


- m) State space analysis is applicable even if the initial conditions are _____.
 (a) Zero (b) Non-zero (c) Equal (d) Not equal
- n) Phase margin of a system is used to specify which of the following?
 (a) Frequency response (b) Absolute stability (c) Relative stability (d) Time response

Attempt any four questions from Q-2 to Q-8

- Q-2 Attempt all questions (14)**
- (a) Define the Term (07)
 i) Time Response ii) Transient Response iii) Steady state response iv) steady state error
 v) Delay time vi) Rise time vii) Peak Time.
- (b) Explain the difference between Open loop and Close loop control system with examples. (07)
 Compare their merits and demerits.
- Q-3 Attempt all questions (14)**
- (a) Using the block diagram reduction techniques, find the closed loop transfer (07)
 Function of the system whose block diagram is given in Fig.1.
- (b) Draw free body diagram and write the differential equation for the given mechanical (07)
 system for Fig 2.
- Q-4 Attempt all questions (14)**
- (a) Define the term (1) Transfer function (2) state (3) Self loop (4) Source node (5) Sink (05)
 node.
- (b) Write a short note on Standard Test Signal. (05)
- (c) What is analogous system? Establish force voltage and force current analogy. (04)
- Q-5 Attempt all questions (14)**
- (a) Obtain overall transfer function C/R of the system whose signal flow graph shown in (07)
 Fig.3.
- (b) Derive the expression for static error coefficient. (07)
- Q-6 Attempt all questions (14)**
- (a) Discuss the stability for the given characteristics equations using Routh-Hurwitz criteria: (08)
 i) $2s^4 + s^3 + 3s^2 + 5s + 10 = 0$
 ii) $s^5 + 4s^4 + 8s^3 + 8s^2 + 7s + 4 = 0$
- (b) Derive the transfer function of simple liquid level system. (06)
- Q-7 Attempt all questions (14)**
- (a) For a Unity feedback system $G(s) = \frac{K}{s(s+2)(s+10)}$. Find Marginal Value of 'K' for which (10)
 system will be marginally stable, using Bode Plot.
- (b) What are advantages of Bode Plots? (04)
- Q-8 Attempt all questions (14)**
- (a) Sketch the Root Locus for the system having $G(S)H(S) = \frac{K}{s(s^2 + 2s + 2)}$ (10)
- (b) What are advantages of Root Locus Method? (04)





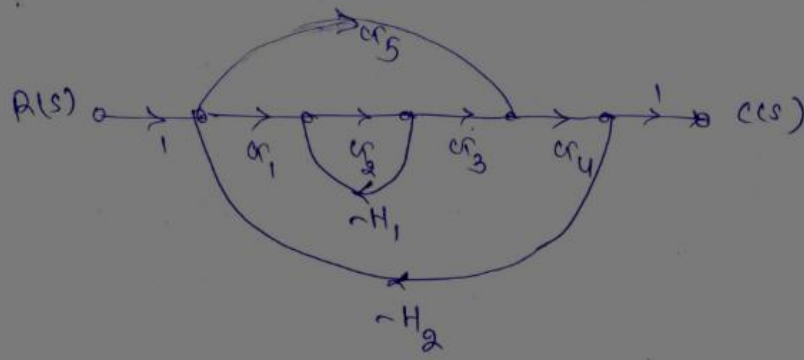


Fig - 3

