

(a)2 (b)3 (c)4 (d)0

n) Signal will become zero when the feedback signal and reference signs are equal.

(a) Input (b) Actuating (c) Feedback (d) Reference

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

Q-2 Attempt all questions (14)

(a) Explain the difference between Open loop and Close loop control system with examples. (07)
Compare their merits and demerits.

(b) Derive the expression for static error coefficient. (07)

Q-3 Attempt all questions (14)

(a) Using the block diagram reduction techniques, find the closed loop transfer Function of the system whose block diagram is given in Fig.1. (07)

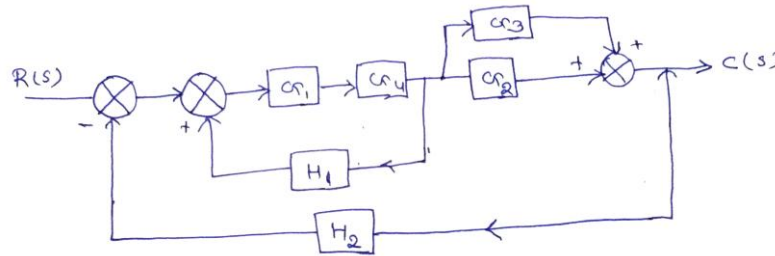


Fig.1

(b) Obtain overall transfer function $C(s)/R(s)$ of the system whose signal flow graph shown in Fig.2. (07)

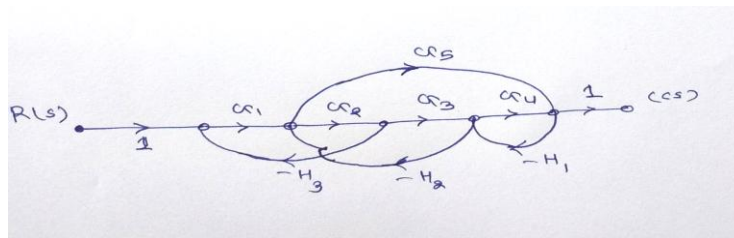


Fig.2

Q-4 Attempt all questions (14)

(a) What is analogous system? Establish force voltage and force current analogy. (07)

(b) Obtain the state model of the given electrical system. (07)

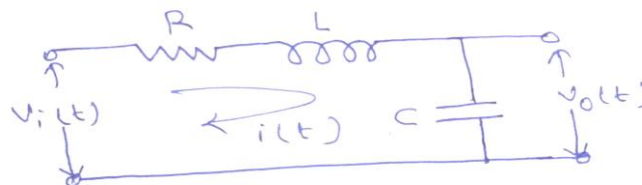


Fig 3

Q-5 Attempt all questions (14)

(a) Draw equivalent diagram and write the equilibrium equation for the given mechanical system. Fig 4 (07)



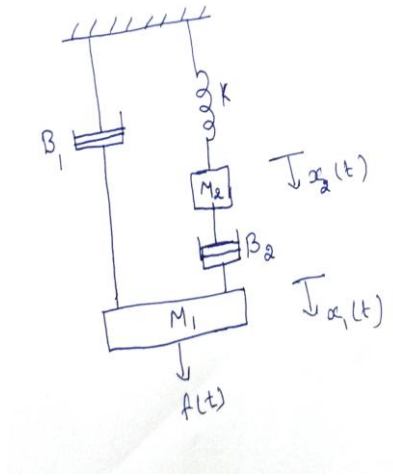


Fig 4

- Q-6**
- (b) Derive the transfer function of simple Liquid level system. (07)
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) For system $s^4 + 22s^3 + 10s^2 + s + K = 0$, find K_{mar} and ω at K_{mar} . (07)
- Q-7**
- Attempt all questions** (14)
- (a) For a unity feedback system, $G(s) = \frac{K}{s(s+2)(s+10)}$. Find the Marginal Value of 'K' for which system will be marginally stable, using bode plot. (10)
- (b) What are Advantages of Bode Plots? (04)
- Q-8**
- Attempt all questions** (14)
- (a) Sketch the Root Locus for the system having $G(S) H(S) = \frac{K}{s(s+1)(s+3)}$. (10)
- (b) What are Advantages of Root Locus Method? (04)

