Question Bank

Subject-Feedback Control System Class-TE

Chapter 1 INTRODUCTION

Short ans Questions

1)What is control system?

2)write the analogous electrical elements in force voltage analogy for the elements of mechanical translational system. (Nov-09)

3)Define open loop and closed loop systems

4)Write the analogous electrical elements in force voltage analogy for the elements of mechanical translational system.

5)Define transfer function

6)Electric hand drier is a example of -----loop system

7) What is source and sink?

8)Define poles and zeros of a transfer function.

Long Ans Questions

1) Determine the transfer function Y2(S)/F(S) of the system shown in fig.



2) Write properties of Transfer Function

3) Diffrentiate Between open loop and closed loop system

4)Write the differential equations governing the mechanical systems shown below. Draw the force-voltage and force-current electrical analogous circuits and verify by writing mesh and node equations.



Chapter 2 Transfer Function Representation

Short ans Questions

- 1)What is block diagram?
- 2) What is source and sink?
- 3)What is servomechanism?
- 4) What are the basic properties of signal flow graph?

Long Ans Questions

1)Obtain the closed loop transfer function C(S)/R(S) of the system whose block diagram is shown in fig



- 2)Compare Open loop and Closed Loop System
- 3) What are Properties of Transfer Function(T.F)
- 4) Derive the Expression for transfer function equation of Armature controlled of DC servomotor
- 5) Derive the Expression for transfer function equation of field controlled of DC servomotor
- 6) Diffrentiate between AC servomotor and DC servomotor.
- **7)** Find the overall gain C(s) / R(s) for the signal flow graph shown below.





Chapter 3 Time Domain Analysis

Short ans Questions

- 1) What are different standard test signal ?
- 2) Define steady state error?
- 3) What are type of system?
- 4) What is time response of feedback control system?
- 5) What are time domain specifications?

Long Questions

- 1) Discuss the various time domain specifications of the second order system with response.
- 2) For unity feedback G(S) =100(S+5)/S2(S+2)(S+6)

Find type of system, error coefficent, ESS

3) What is meant by second order system ? Derive time domain unit step response of underdamped second order system

4)What is time response of feedback control system? Derive the expression for error coefficent and steady state error.

5) Problems on time domain specification

Chapter 4 Stability Analysis

Short ans Questions

- 1) write in detail the relative stability of the system.
- 2) Define the terms gain margin and phase margin
- 3) explain R-H Criterion
- 4) what is critical stability?
- 5) What is cetriod?

Long Questions

1) Check the following system is stable or unstable using R-H criterion $s^{6}+3s^{5}+9s^{3}+8s^{2}+6s+4=0$

- 2) Explain the rules to sketch the root locus.
- 3)The characteristic equations for certain feedback control systems is given as. Determine the range

of values of k for the system to be stable $s^4+4s^3+13s^2+36s+k=0$

4)Find the number of roots in the right half of the s-plane using R-H criterion, for the characteristic equation given below : $s^{5} + s^{4} + 2s^{3} + 2s^{2} + 3s + 5 = 0$

5)Write short note on (any three)

- mason gain formula a)
- b) properties of z transform.
- Stepper motor c)
- d) PID controller

Chapter 5 Frequency Response Analysis

Short ans Questions

- 1)Define the terms gain margin and phase margin
- 2)What is bode plot ?
- 3) what is corelation between time and frequency domain?
- 4) What is polar plot?
- 5) what are advatages of bode plot ?
- 6) what is wgc and wpc?

Long Questions

1) The open-100p transfer function of a unity feedback system is $G(S) = \frac{K}{S(S+1)(S+2)}$

Draw the bode plot and find GM, PM, Wge, WPC and comment on stability

- 2) Draw the Nyquist plot and decide the stability of unity feedback control system having open-100 p transfer function also obtain gain and phase margin G(S)-H(S)=k/s(s+3)(s+4)
- 3) Problems on bode plot and Nyquist plot

Chapter 6 State variable Analysis and design

Short ans Questions

- 1) Define the terms state, state variables ,state factor, state space, state trajectory.
- 2)What do you mean by ' Natural Network '
- 3)What is meant by controllability
- 4) Explain sensor and releys
- 5) What is PLC

Long Question

- 1) Evaluate controllability and observability of the system represented in state space model with,
- 2) what is Electronic controller
- 3) what is Fuzzy logic control system
- 4) What is concept of controllability and observability
 - 5) Explain in brief PLC