1. Control systems
2. Input and output signals of the Control systems
3. Feedback signals of the Control systems
4. Transfer function of the Control system
   1. Pole zero form
   2. Time constant form
5. Unity feedback
6. System gain and root locus gain of the control systems
7. Conversation of transfer function from pole zero form to time constant form and vice versa
8. Forward and feedback path gains
9. Unity feedback
10. +ve and -ve feedback
11. Open loop transfer function and closed loop transfer function
12. Open loop poles and closed loop poles
13. Zeros of the system
14. Location of poles and zeros in s-plane
15. Identification of voltage and current variables of the circuit
16. Writing V and I equations of the electrical network
17. Writing SFG of the circuit from V and I equations
18. Masson’s gain formula of SFG
19. Forward paths, loop, path and loop gain
20. Two non- touching loops and their gains
21. Delta and delta I of the Mason’s formula
22. Roots of numerator and denominator of the transfer function (poles and zeros)
23. Prediction of poles and zeros, DC and high frequency gain of the electrical network.
24. Effect of adding R and C to the Electrical network
25. Identification of ‘take-off’ and ‘summing ‘ points in the block diagram
26. Writing the SFG of the block diagram
27. Time response of control systems
28. Laplace transform of V, I, R, L and C of the electrical network
29. Laplace transform of standard inputs
30. Dominant poles
31. Time response for unit impulse of control systems with closed loop poles at
    1. Left half of the Real axis of s plane
    2. Right half of the Real axis
    3. Complex conjugate poles
    4. Imaginary poles
    5. Repeated poles on the Imaginary axis
    6. At the origin
    7. Repeating poles at the origin
32. Stability of the system
33. Order and type of the system
34. Open loop poles at the origin
35. Conditions for stability of the system
36. Stable, critically/oscillators/marginally stable, unstable system
37. Relatively stability of system
38. Error signal e(t)
39. Steady state Error ess
40. Error coefficients Kp, Kv and Ka
41. Ess of the system for various inputs
42. II order system, standard form of the transfer function
43. Characteristic equation of a system
44. Location of closed loop poles of 2 nd order system for damping factor value between 0 and 1
45. Zeta damping ratio, Wn Wd
46. Expression for output C(t) of under damped system for unit step input
47. Typical output response of II order system for unit step input ( under, over and critically damped conditions)
48. Expression for Mp, tr, tp, ts of II order under damped system for unit step input
49. Impact of system gain on the time response of the system
50. P, PD, PI and PID controllers
51. Movement of open loop poles upon closing the feedback loop and changing the K value
52. Root locus of a control system
53. Origin and termination points of closed loop poles as k changes from 0 to infinite
54. Asymptotes, breakaway, meet in points
55. Routh’s array
56. Auxiliary equation
57. Intersection of Root locus on Imaginary axis
58. Frequency of oscillations
59. Frequency response of control systems
60. Bode plots
61. Magnitude and phase plots
62. Magnitude at the origin
63. Cut off Frequencies, slope of the Magnitude plots
64. Gain and phase cross over Frequencies
65. Gain and phase margins
66. Absolutely stability and Absolutely unable systems
67. Polar plots
68. Nyquist stability criterion
69. Enclosed, not enclosed
70. Encirclement of Nyquist plot
71. Compensation of system
72. Phase lead, lag and lead-lag network