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 Control system and PLC (17536)-Question Bank

1. State Routh’s criterion. Define stability in control system.
2. Define transient response and steady state response, give their significance.
3. Find transfer function for second order R-L-C circuit fig.



1. solve examples on block diagram reduction techniques.
2. Determine stability of system whose characteristic equation is given as s6+ 4s5+ 3s4– 16s2– 64s – 48 = 0.
3. Compare AC servomotor and DC servomotor (any four points).
4. For unity feedback system G(s) =k/s(1+0.4s)(1+0.25s). Find range of values of ‘K’. Calculate marginal value of ‘K’.
5. For given differential equation

$$\frac{d^{2}c(t)}{dt^{2}}+5\frac{dc(t)}{dt}+8c\left(t\right)=2\frac{dr(t)}{dt}+r(t)$$

Determine its transfer function. Here c (t) – output and r (t) = input.

1. Explain ON-OFF controller. State significance of neutral zone.
2. Explain PI control action with mathematical equation. Also state its significance.
3. For given closed loop transfer function

$$\frac{C(s)}{R(s)}=\frac{10(s+8)}{s\left(s+3\right)\left(s+5\right)(s^{2}+12s+35)}$$

Determine :

1. poles ii) zero iii) characteristic equation iv) pole-zero plot.
2. For system characteristic equation is s4+ 22s3+ 10s2+ s+ K = 0. Find Kmar.
3. T.F of second order system is given by

$$\frac{C(s)}{R(s)}=\frac{25}{(s^{2}+6s+25)}$$

Find Tr, Tp, Tsand %Mp for unit step input.

1. Define Transfer Function. State its advantages.
2. Describe servo mechanism with position control system.
3. Explain PID controller with mathematical equation. State any two advantages of PID controller.
4. Describe the working of synchro control transformer as an error detector.
5. A unity feedback system has

$$G(s)=\frac{20(s+2)}{s\left(s+3\right)(s+5)}$$

Determine :

i) Type of system

ii) Kp, Kv, Ka

1. Define linear, nonlinear, time invariant and time varying control system.
2. Why ‘D’ control action is not used alone ? Justify.
3. Compare between stepper motor and DC servo motor. (any four points)
4. State advantages of ‘P’ controller over ON-OFF controller.
5. Find Kp, Kv, Ka and steady state error for a system with open loop T.F.

$$G(s)=\frac{10\left(s+2\right)(s+3)}{s\left(s+1\right)\left(s+5\right)(s+4)}$$

where input is $r\left(t\right)= 3+t+t^{2}$

1. State w.r.t PLC i. System memory. Ii. Application memory

Iii Program files iv .Data files

1. Draw Ladder diagram for 2 motor operation for following conditions: i) Start push button starts motors M1 and M2

ii) Stop push button stops motor M1 first and after 10 seconds

motor M2

1. Draw labelled block diagram of PLC
2. Describe the classification of I/O modules in PLC
3. Differentiate between Fixed PLC and Modular PLC
4. Draw the BD of AC discrete input module of PLC

Note: Also refer sample question Papers