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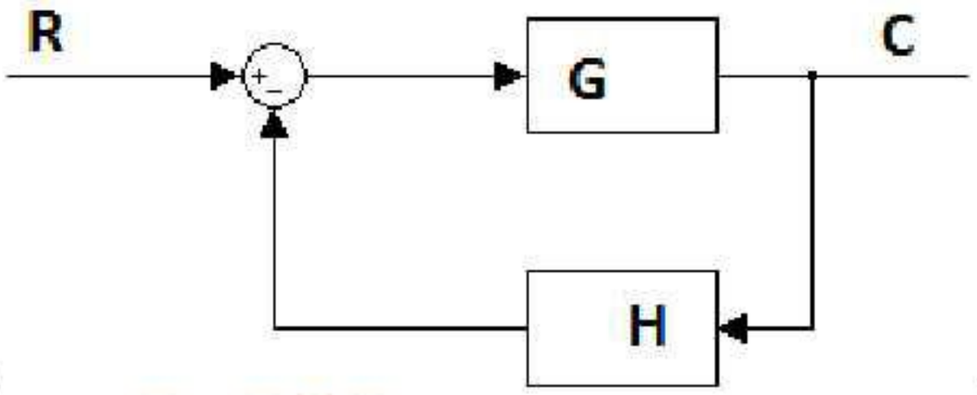
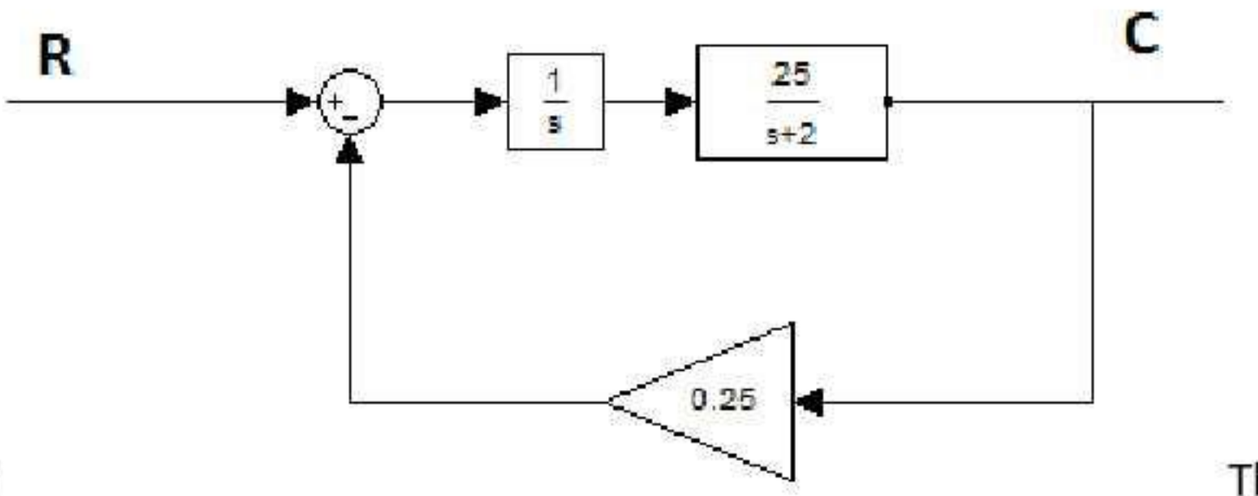
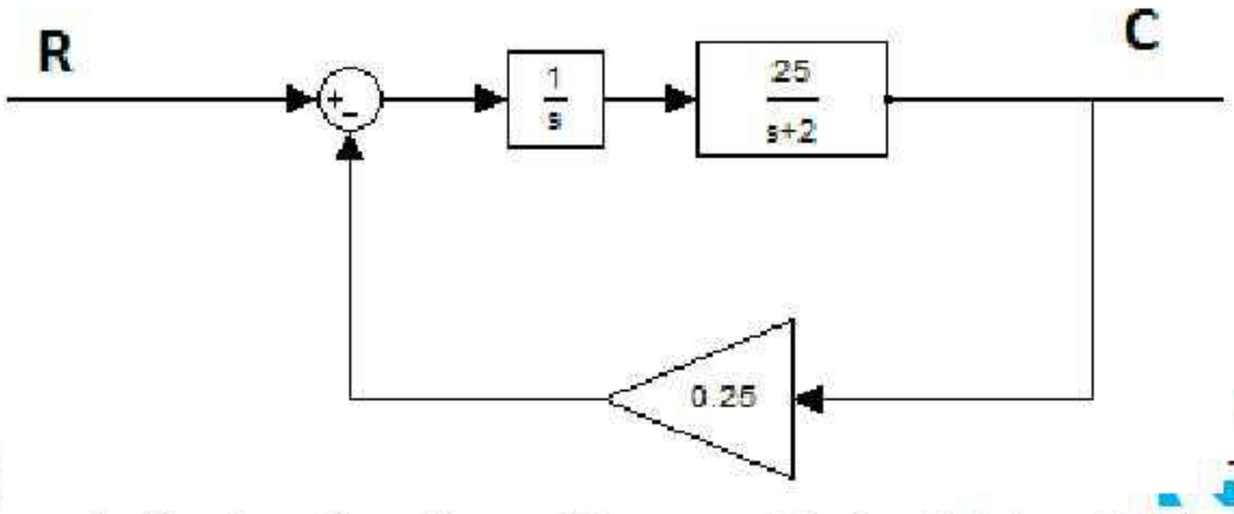
Q)A traffic signal operated on a time basis is an example for--> **open loop control system**
Q)If the disturbance is produced within the system , it is termed as--> **internal disturbance**
Q)The actual response that is obtained from a control system with the application of reference signal is called--> **Output**
Q)Error signal may be defined as--> **it is the difference between the reference input and the feedback signal**
Q)The parameter of system are varying with respect to time then it is called--> **Time variant control system**
Q)A system is know as linear if it satisfies the principle of--> **Super position addition to additive and homogenous**
Q)A closed loop system can be defined as--> **system with a measurement of the output signal and a comparison with the desired output to generate an error signal that is applied to the actuator**
Q)A negative feedback control system is the one where--> **the output signal is fed back as it subtracts from the input signal to reduce the output response**
Q)The change in variables due to variations of the parameters in control system expressed in terms of--> **sensitivity**
Q)Compared to open loop control system, the change in the output of closed loop system due to variation G(S) is reduced by a factor of--> **1+G(S)*H(S)**
Q)Disturbance in the forward path of closed loop system can be minimized by using--> **higher values of G(S)**
Q)A system sensitivity can be expressed as--> **the ratio of the change in the transfer function to the change of process transfer function for a small incremental change**
Q)Resister is example for--> **linear control system**
Q)A space vehicle leaving the earth is an example for--> **time varying control system**
Q)The following system is more economic--> **open loop control system**
Q)In Closed loop control system, the negative feedback the overall gain of the system--> **decreases**
Q)The sensitivity of the open loop control system with respect to G is--> **1**



Q) The sensitivity of closed loop system with respect to forward path is--> **1/1+GH**



Q) The sensitivity of closed loop system shown in fig at w=1 rad/sec with respect to forward path transfer function--> **0.398**



Q) The sensitivity of closed loop system shown in fig at w=1 rad/sec with respect to feedback path is--> **-1.11**

Q)For a feedback control system transient response and steady state response respectively means--> **response that disappears with time and that exists after a long passage of time**

Q)Due to use of feedback, the time constant--> **gets reduced**

Q)The effect of introducing the feedback can be expressed as--> **reducing the sensitivity , improving the transient response and introducing the possibility of instability**

Q)Due to the use of feedback, the steady state error--> **gets reduced**

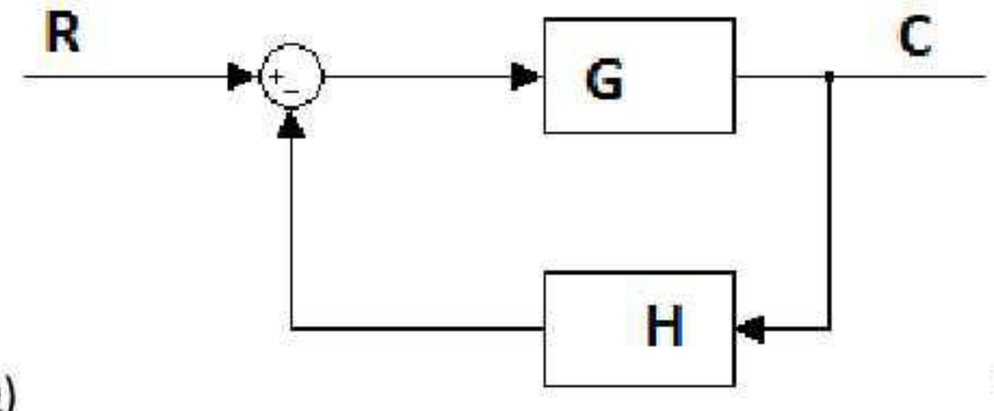
Q)The transfer function of the system described by $\ddot{y}+\dot{y}=\dot{u}+2u$ with u as input and y as output is--> $\frac{(s+2)}{s^2+s}$

Q)A system said to be linear time invariant if--> **the system parameters doesnt vary with time**

Q)A LTI system, initially at rest when subjected to a unit step input gave a response C (t) = t e^{-t} (t>=0), the transfer function of the system is--> $\frac{s}{(s+1)^2}$

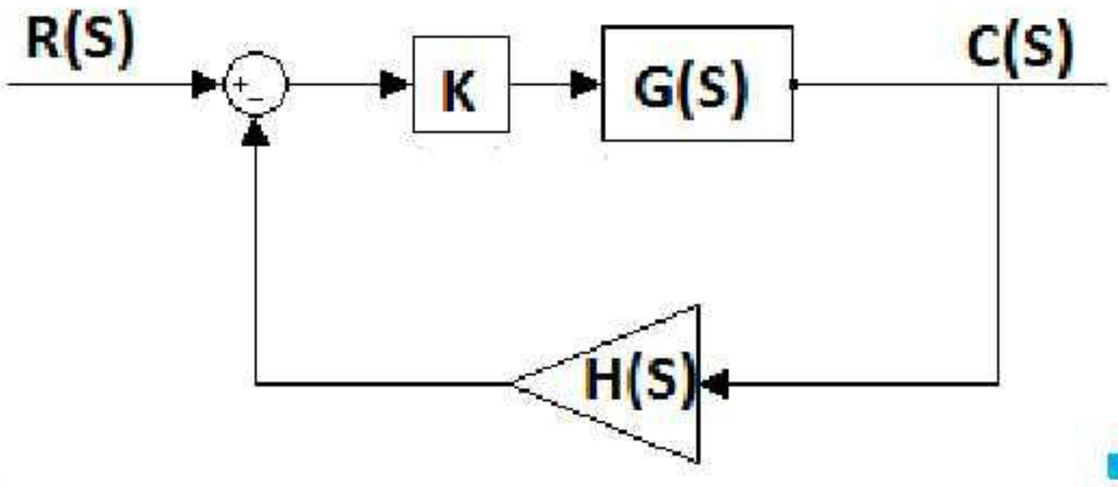
Q)Consider the following statements , feedback in control system can be used 1) to reduce the sensitivity of the system to parameter variations and disturbance 2) to change time constant of the system 3) to increase loop gain of the system which of the statements given above are correct--> **1 and 2**

Q)Input is δ(t) and output is $10e^{-2t}$ u(t), The Transfer function of the system is--> $\frac{10}{s+2}$



Q) The sensitivity of closed loop system with respect to feedback path is--> **GH/1+GH**

Q)A feedback control system with high gain K, is shown in the figure



below Then the closed loop transfer function is--> **sensitive to perturbations in H(S) and but not to perturbations in G(S)**

Q)A control system with impulse response $0.5(1+e^{-2t})$ is cascaded to another control block which has impulse Response e^{-t}. the transfer function of the cascaded combination is--> $\frac{1}{s(s+2)}$

Q)The transfer function of a control system depends only on--> **system parameters**

Q)The impulse response of an initially relaxed linear system is e^{-2t} u(t), to produce a response of te^{-2t} u(t), the input must be equal to--> **e^{-2t} u(t)**

Q)The output of a feedback control system must be a function of--> **reference input &error signal**

Q)Output of a linear system for a unit step input is given by t^2e^{-2t} its transfer function is--> $\frac{2s}{(s+2)^3}$

Q)The transfer function of a system is G(S)= $\frac{K(S+1)}{S^3(S+5)}$ the type and order of the system are--> **3 and 4**

Q)Compared to a 2-phse induction motor an ac servo motor will have--> **low X/R ratio**

Q)The error detector element in a control system gives--> **sum of the reference & feedback signals**

Q)Which of the following is an open loop control system ?--> **Field controlled D.C. motor**

Q)Which of the following statements is not necessarily correct for open control system?--> **Presence of non-linearities causes malfunctioning**

Q)A car is running at a constant speed of 50 km/h, which of the following is the feedback element for the driver?--> **Needle of the speedometer**

Q)A control system working under unknown random actions is called--> **stochastic control system**

Q)Based on F-I analogy, Moment of inertia and spring elements of mechanical systems are analogous to--> **capacitance and reciprocal of inductance**

Q)What are the basic elements of rotational system--> **Moment of inertia, dash pot, spring**

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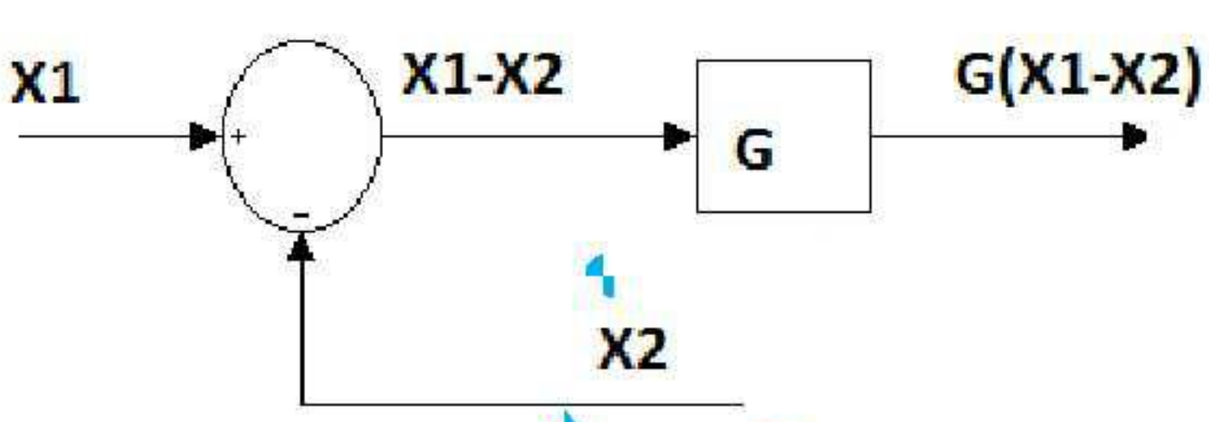
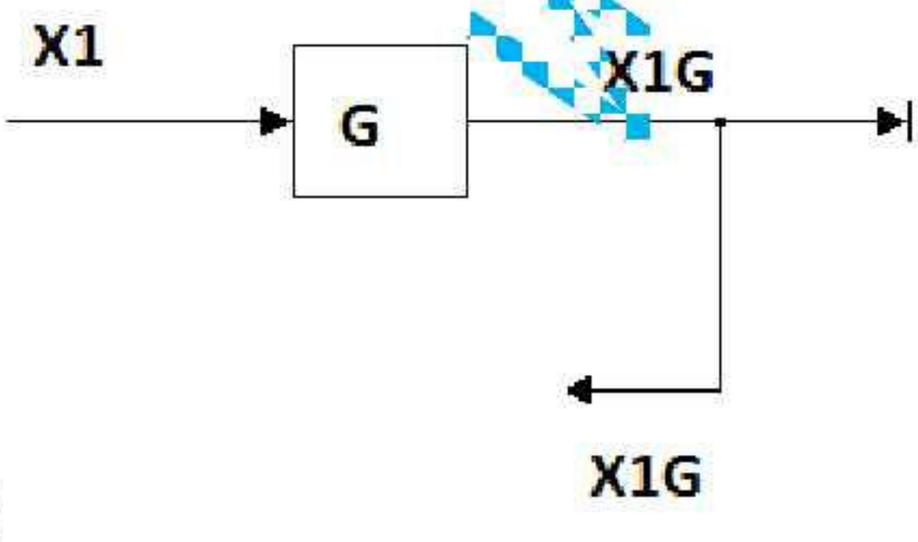
Q)What is the impulse response of the system 1/(s(s+1) for t>0?--> **1-e^{-t}**
Q)Based on F-V analogy, Mass and Dash pot elements of mechanical systems are analogous to--> **inductance and resistance**

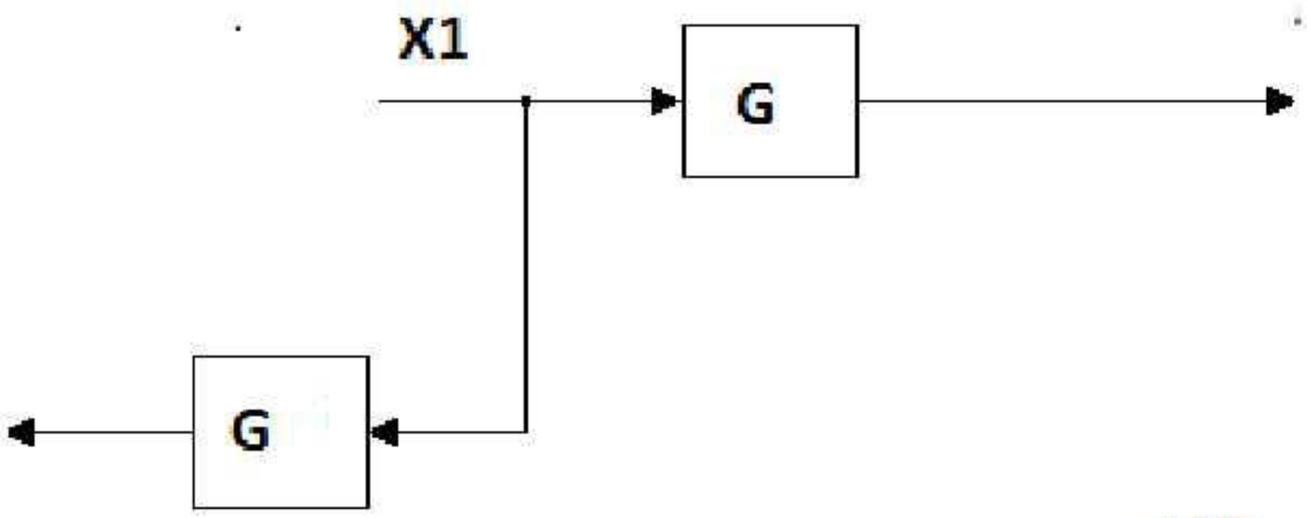
Q)DC servo motors are now constructed with permanent magnets resulting in..--> **higher torque/inertia ratio, higher efficiency**
Q)Which of the following is the non-linearity caused by servomotor?--> **Saturation**
Q)The ---- type of rotor used in ac servo motors--> **drag cup type rotor**
Q)Another name for synchro is--> **autosyn**
Q)A.C. servomotor resembles--> **two phase induction motor**
Q)The second derivative input signals modify which of the following--> **The time constant and suppress the oscillations**
Q)Regenerative feedback implies feedback with--> **positive sign**
Q)The temperature, under thermal and electrical system analogy, is considered analogous to--> **voltage**
Q)Which of the following is the output of a thermocouple?--> **D. D. voltage**
Q)The block diagram reduction processes is--> **tedious and more time consuming**



Q) The rule for block diagram algebra for moving a summing point after a block is-->



Q) The rule for block diagram algebra for moving a take off



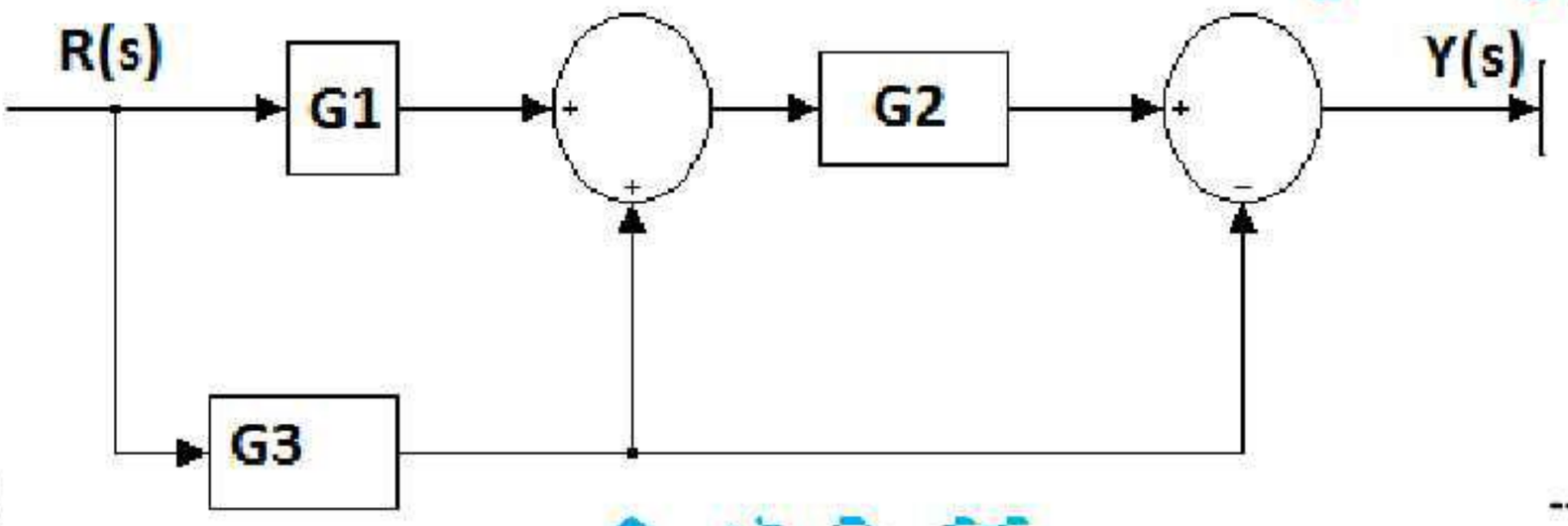
point ahead of a block is-->

Q)The construction of synchro is similar to that of a--> **3 phase alternator**

Q)Synchro is also called as--> **error detector**

Q)In AC servo motors , the torque generated by motor is a function of--> **voltage and speed**

Q)Why the Conventional induction motor are not used as servomotors--> **because of negative damping**

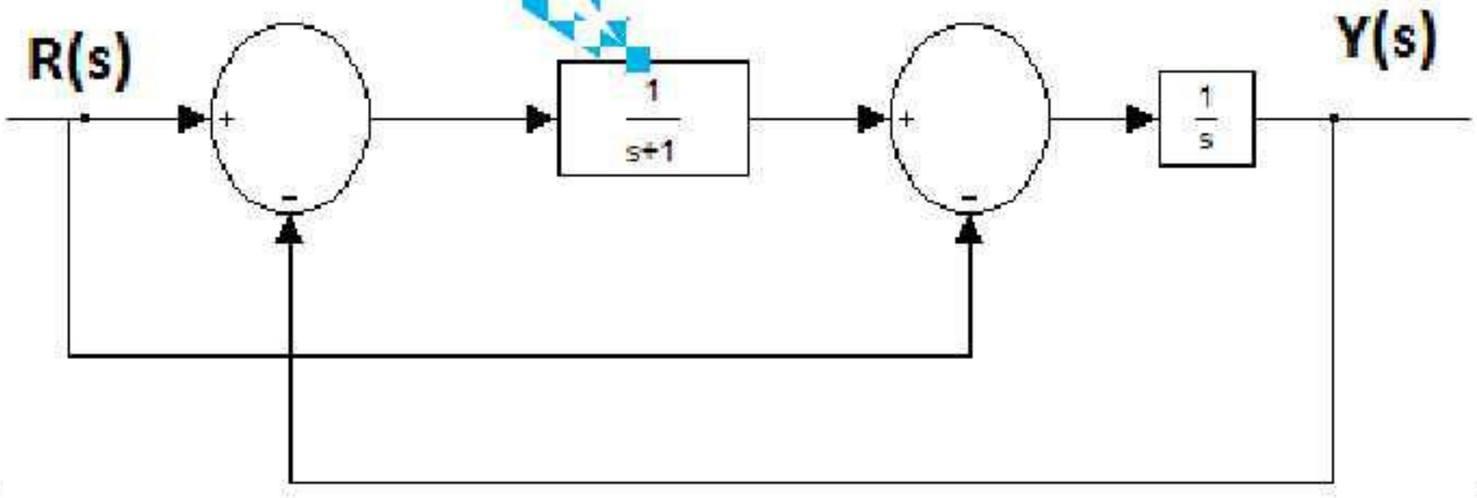


Q) --> **G1G2+G2G3-G3**

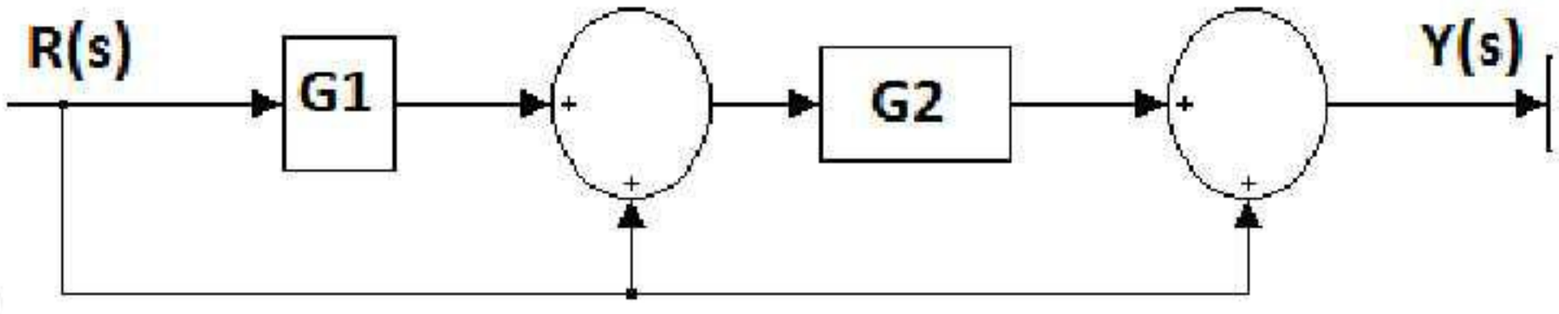
Q)Block diagram approach is not suitable for--> **complex control systems**

Q)A synchro transmitter consists of a--> **3-phase balanced stator winding excited by 3phase balanced ac & rotor connected to dc voltage**

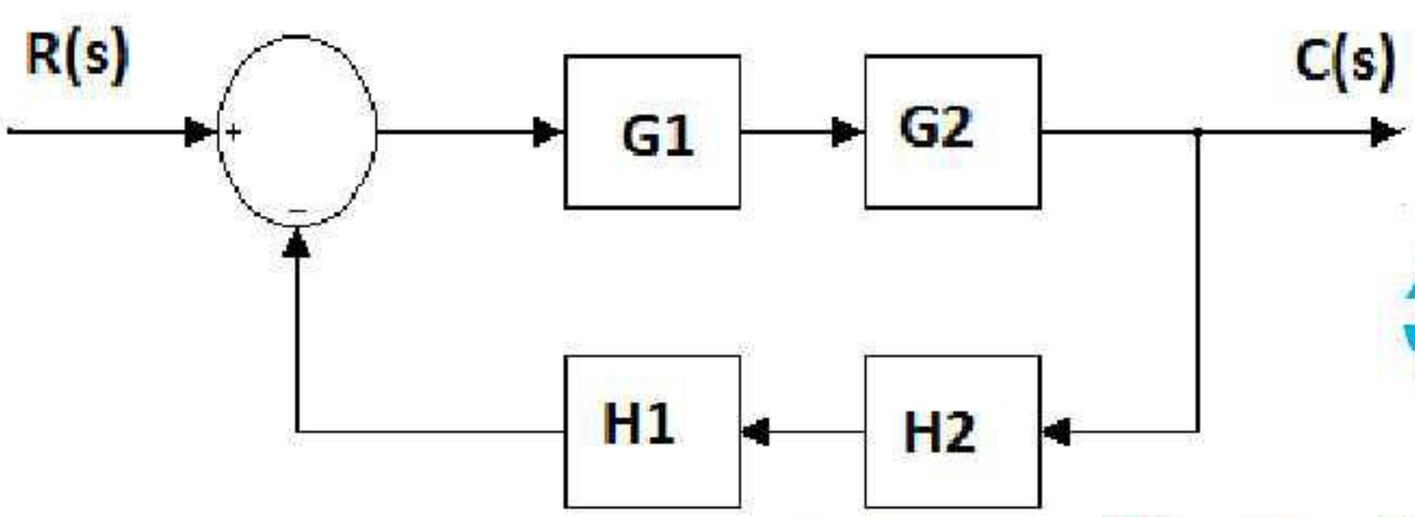
Q)A signal flow graph is a--> **A topological representation of a set of differential equations**



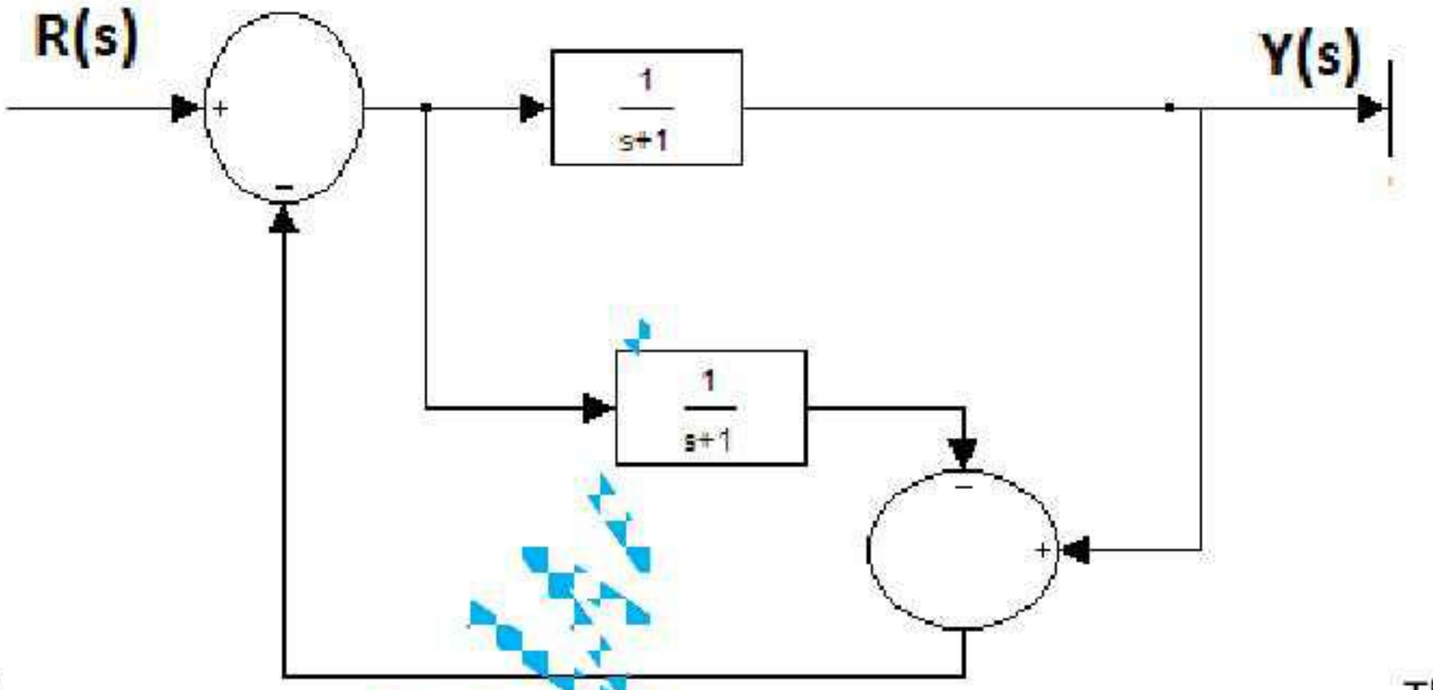
Q) The transfer function Y(s)/R(s) of the system shown in fig--> $\frac{-s}{s^2+s+1}$



Q) The transfer function Y(s)/R(s) of the system shown in fig--> **G1G2+G2+1**



Q) The transfer function of the feedback control system shown fig--> $\frac{G1G2}{1+G1G2H1H2}$

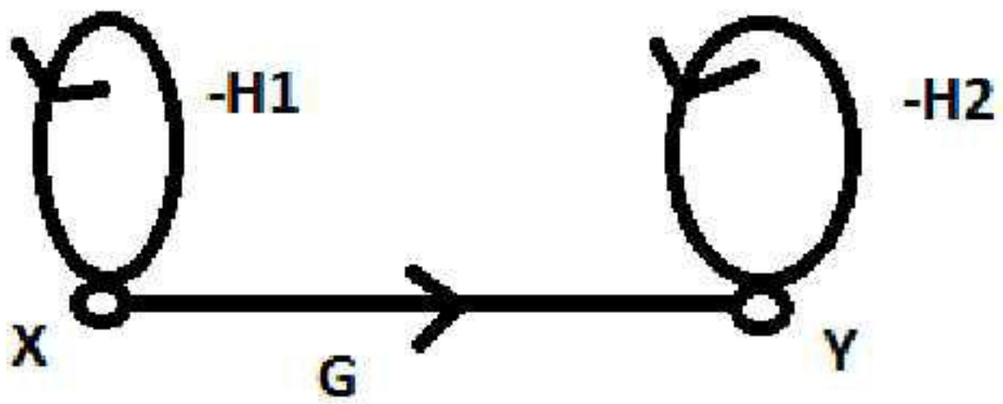


Q) The transfer function Y(s)/R(s) of the system shown is--> **1/(s+1)**

Q)Loop gain is equal to--> **product of all branch gains in a loop**

Q)The direction of signal flow through a block is --> **unidirectional**

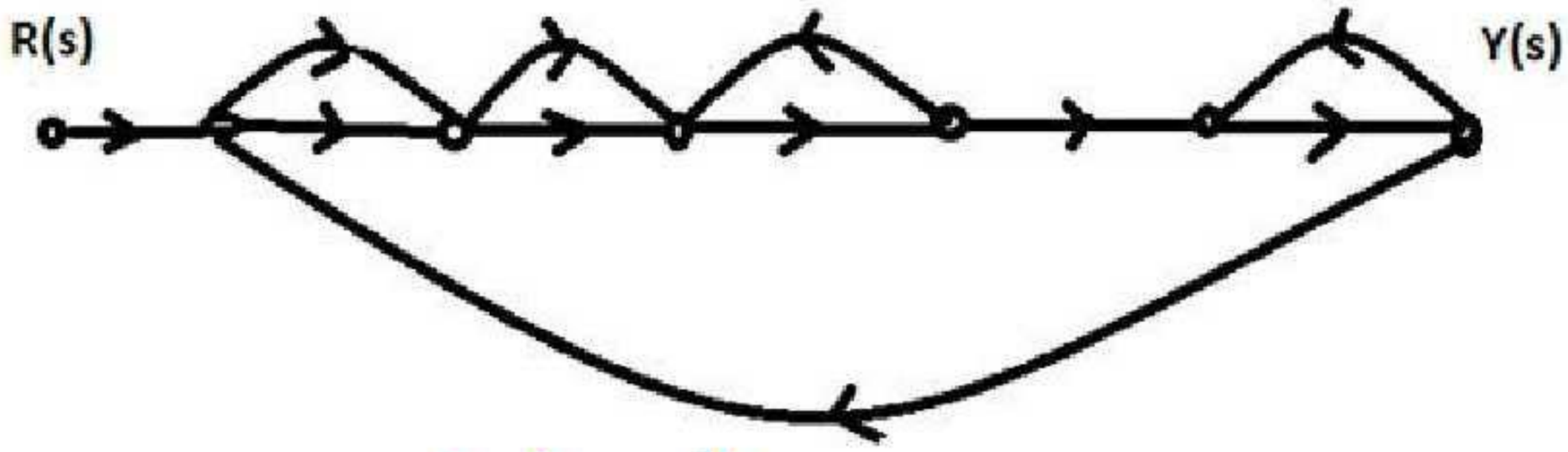
Q)From which of the following transfer function can be obtained?--> **Signal flow graph**



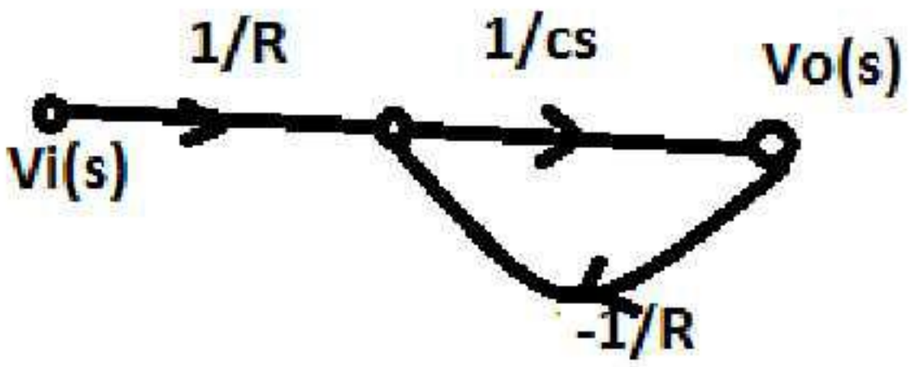
Q) The transfer function of given signal flow graph is--> **G/1+H2**

Q)In a signal flow graph loops are said to non touching if--> **they do not posses any common node**
Q)Signal flow graphs are primarily useful for--> **feedback control systems because feedback theory is primarily concerned with the flow and processing of signal in systems**

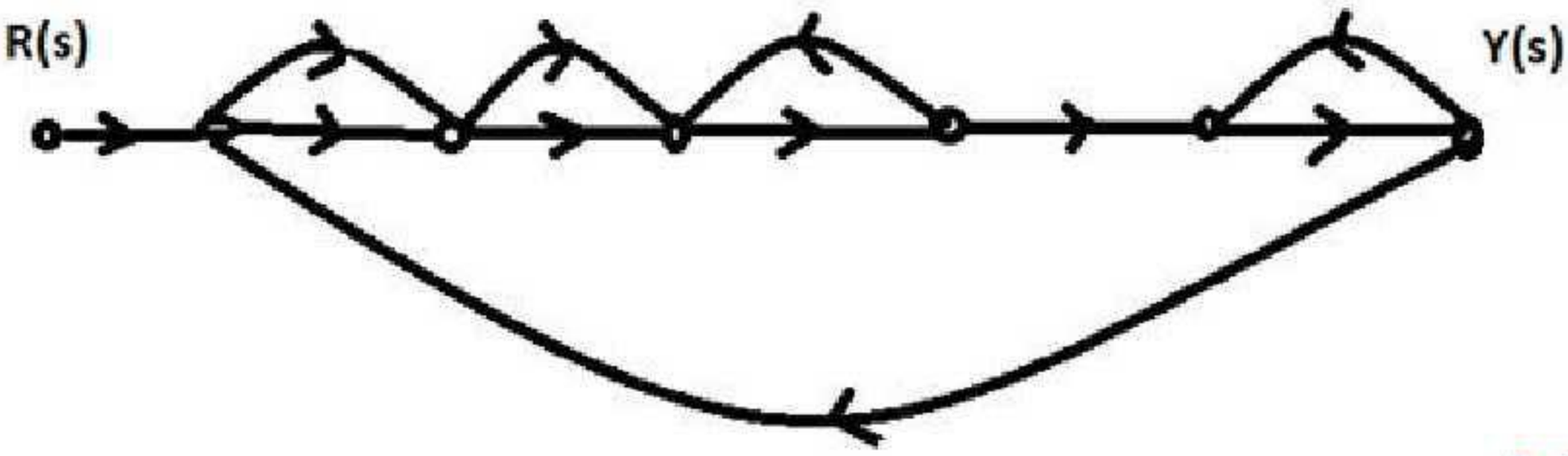
Q)In a signal flow graph, the nodes represent--> **the system variables**
Q)In a signal-flow graph forward path is a--> **path from the input node to the output node**



Q) Number of forward paths in signal flow graph--> **4**

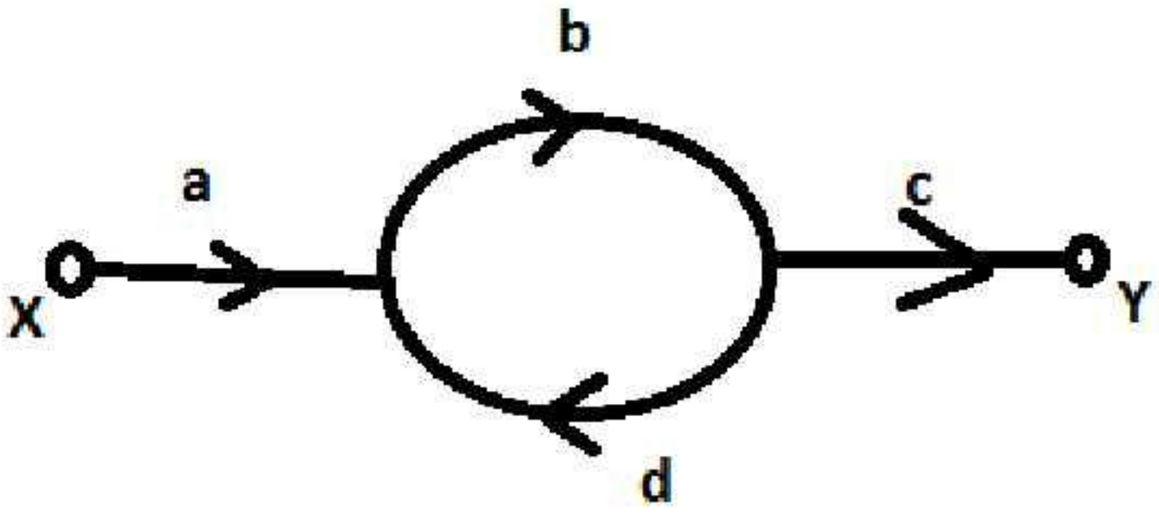


Q) The overall transfer function of given signal flow graph is--> **1/(CSR+1)**



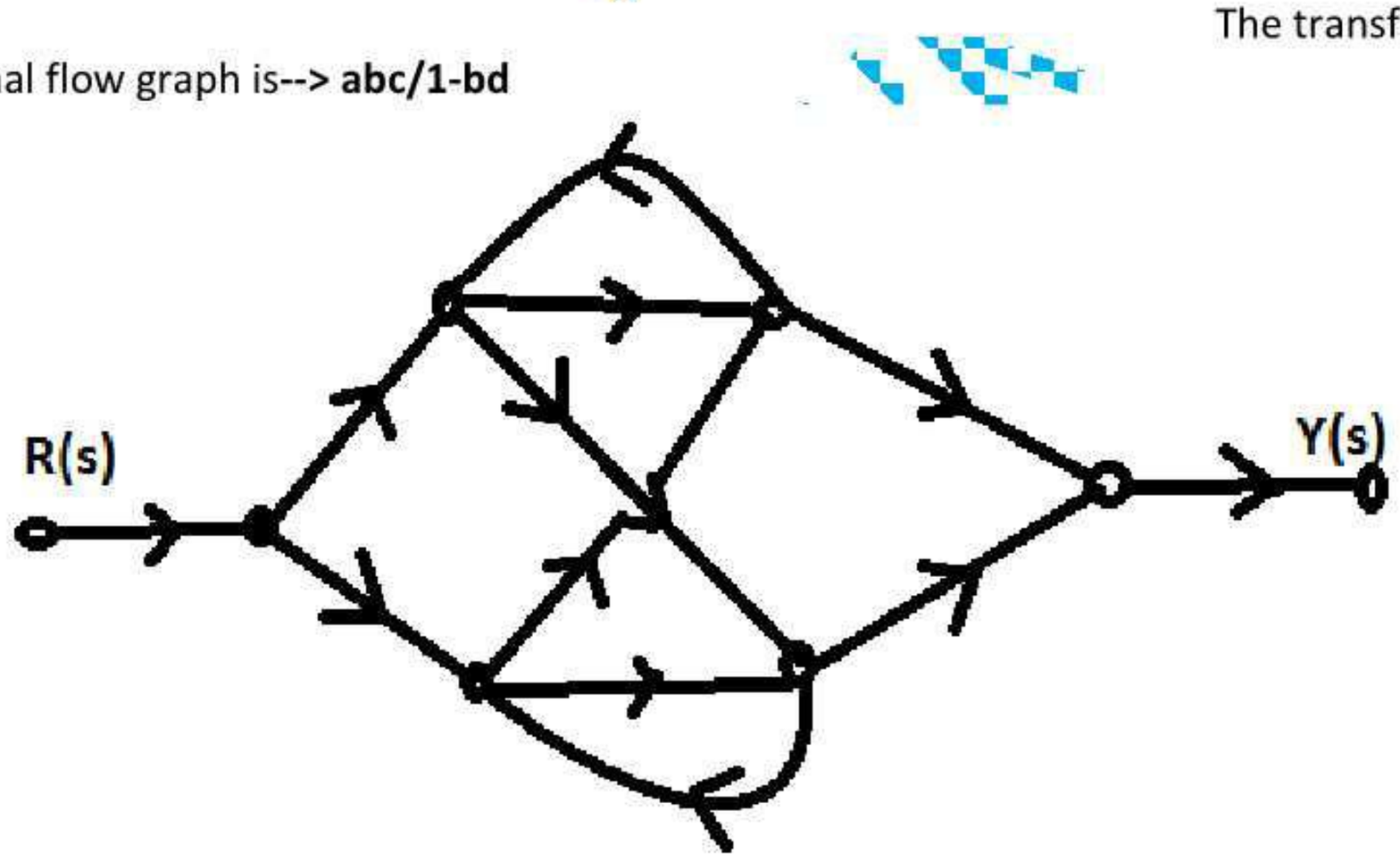
Q)
loops in given signal flow graph are--> **6**

Number of



Q)
signal flow graph is--> **abc/1-bd**

The transfer function of given



Q)
in signal flow graph--> **6**

No of forward paths

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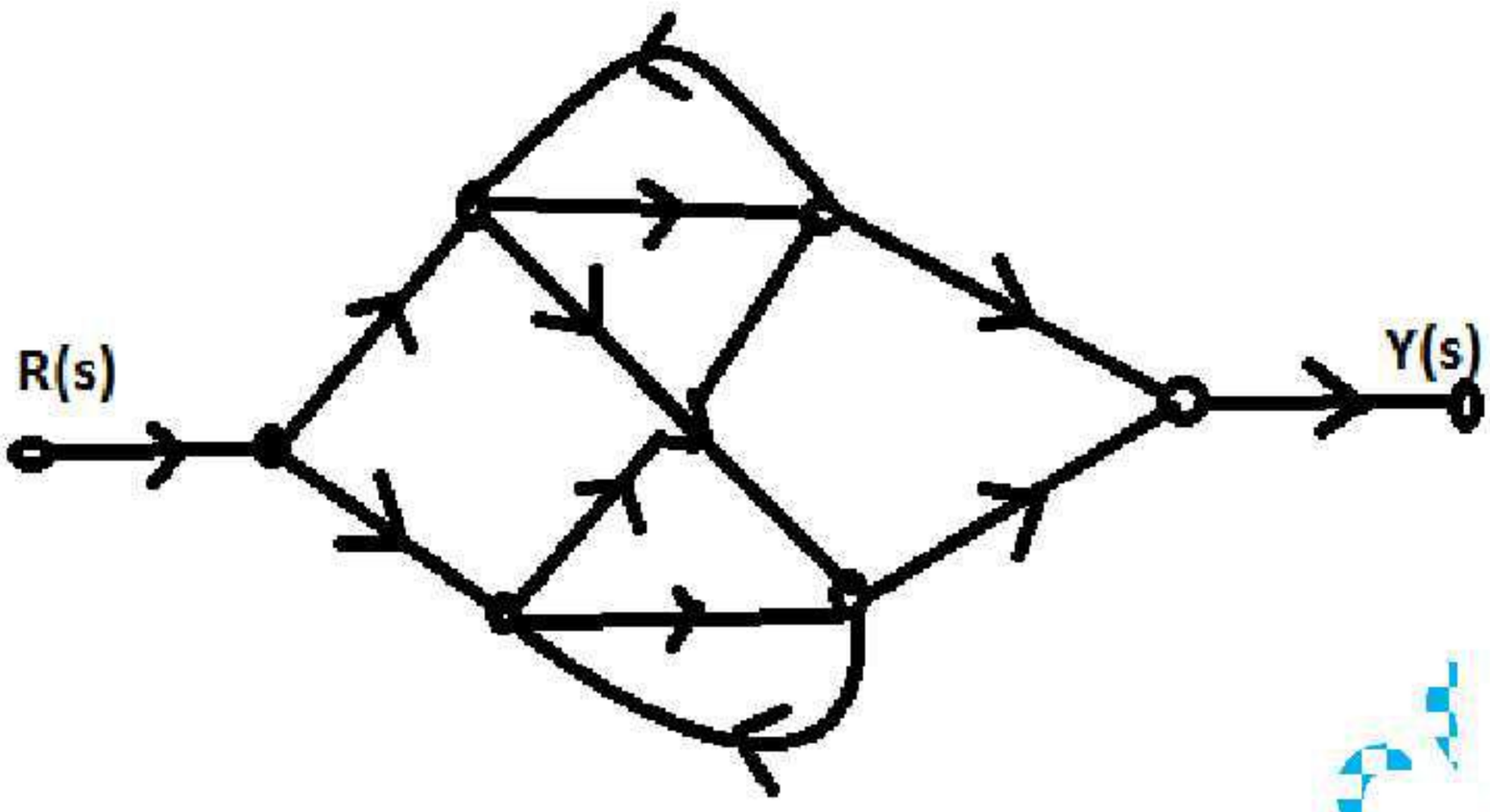
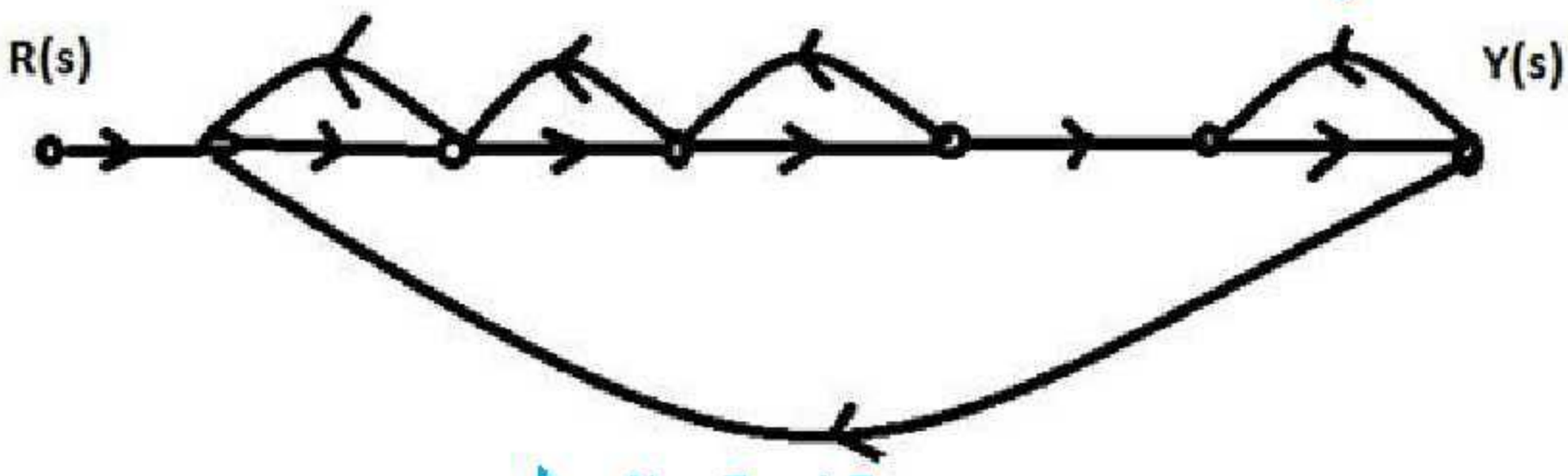


Q)
signal flow graph are--> **3**



Q) Number of loops in given signal flow graph are--> **3**

Q)The forward path transfer function of a unity feedback control system is G(s) = 1000/(1+0.1S)(1+10s), The respective step, ramp and parabolic error constants are--> **1000, 0, 0**

Q)What is the order of transfer function of armature controlled dc motor--> **3**

Q)For the standard 2nd order system the overshoot is 10% and if the input is doubled the magnitude of overshoot and percentage overshoot respectively--> **0.2& 10%**

Q)Masons gain formula for overall gain T can be expressed as$T = \frac{1}{\Delta}\sum_{K}^{N} P_K \Delta_K$ The value of Δ is calculated as--> **1-(Sum of all different loop gains)+(sum of gain products of all possible combinations of two non touching loops)-(sum of gain products of all possible combinations of three non touching loops)+.**

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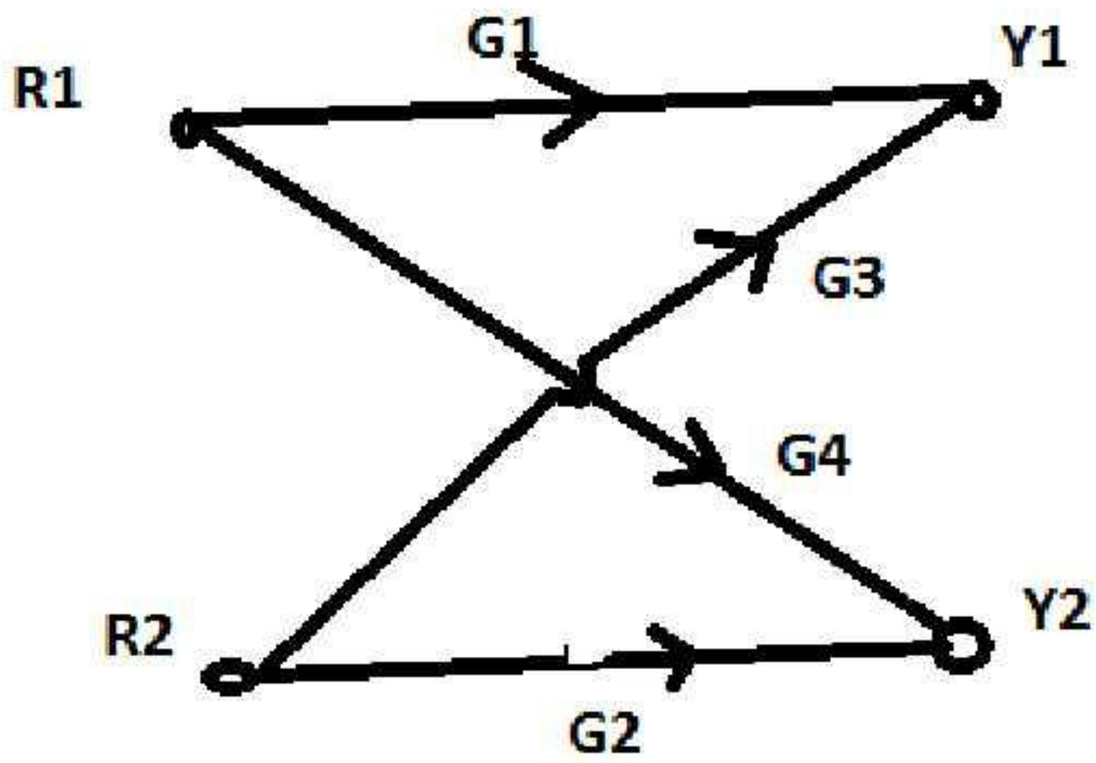


Q) The corresponding algebraic equations are written as--> **Y2= G3R1-G2R2**

Q)A Large time constant and small time constant of a system corresponds respectively to--> **sluggish system and fast response system**

Q)A System with transfer function 1/TS+1, is subjected to a step input takes 10 seconds to reach 50% of the step height. The value of T is--> **14.4 s**

Q)A controller, essentially, is a--> **comparator**

Q)The step and ramp test input signals can be expressed as--> **R(s)= A/S , R(s)=A/S^2**

Q)In an automatic control system which of the following elements is not used?--> **Oscillator**

Q)What type rotor is used in synchro transmitter--> **dumbbell type**

Q)The time constants of Un damped, under damped, critically damped and over damped systems are--> **infinite, lowest, medium, largest respectively**

Q).Increases the steady state accuracy,--> **Integrator**

Q)The transient response, with feedback system,--> **decays quickly**

Q)The Laplace transform of $(t^2-2t)u(t-1)$ is--> $\frac{2}{s^3}e^{-2s}-\frac{2}{s^2}e^{-s}$

Q)k/S^N(Ts+1), The power of S^N determines the system--> **type**

Q)If the unit step response of a system is a unit impulse function, the transfer function of such a system is--> **S**

Q)For a system with process transfer function G(s)= K/TS+1 , the steady state error for the closed loop system will be zero when--> **K=∞**

Q)For a system with process transfer function G(s)= K/TS+1 , the steady state error for the closed loop system will be zero when--> **K=1**

Q)The impulse and parabola test input signals can be expressed as--> **R(s)= 1, R(s)= A/S^3**

Q)Which input yields natural response of a system?--> **impulse input**

Q)Settling time taken by the response to reach 5% tolerance band is--> $\frac{3}{\xi\omega}$

Q)The steady state error for type -2 system for unit ramp input is--> **0**

Q)The time required to rise from 0% to 50% of final value for over damped system is its--> **delay time**

Q)A Control system having unit damping factor will give--> **critically damped response**

Q)The type of the system , G(s) = $\frac{3}{S^2+3S=8}$ is--> **0**

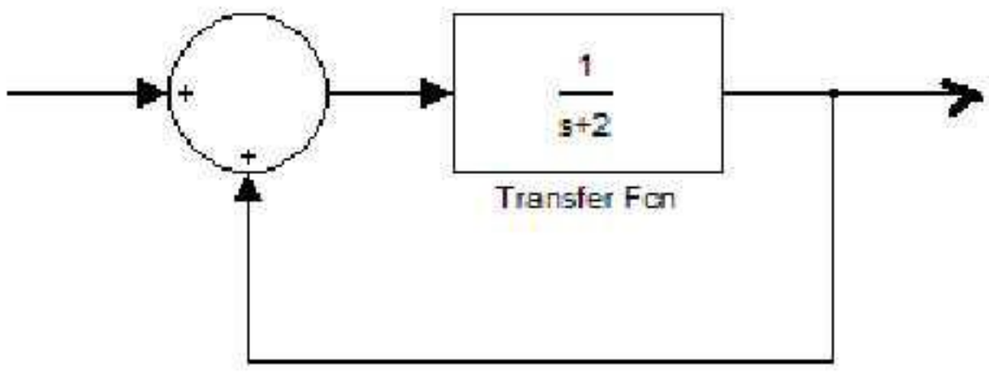
Q)The time required for the response to reach half the final value the very first time is called--> **delay**

time

Q)The time required to rise from 10% to 90% of final value for over damped system is its--> **rise time**

Q)TF= $\frac{100}{(S+10)(S^2+2S+2)}$ using the dominant pole concept the 2nd order approximation of the above TF is--> $\frac{10}{S^2+2S+2}$

Q)The ratio of time constants of the open loop to closed TF of the following system is



--> **3:2**

Q)For a unity feedback system having an open loop transfer function , G(s)= $\frac{k(S+2)}{S^2(S^2+7S+12)}$, The error constants $K_p, K_v \text{ and } K_a$ respectively are--> **∞ ∞ k/6**

Q)Velocity error is--> **an error in position due to ramp input**

Q)The values of static error constants K_p for type 0,1 and higher systems are respectively--> **finite, infinite, infinite**

Q)The steady state error for type -0 system for unit step input is--> **1/1+** K_p

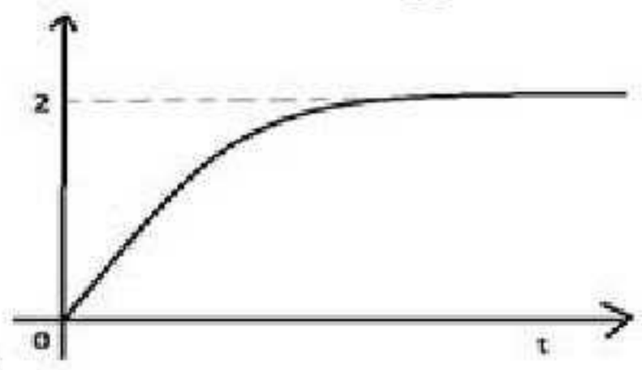
Q)The values of static error constants K_a for type 0,1 and higher systems are respectively--> **∞, ∞, 1/** K_a

Q)What is the value of ξ for under damped system--> **0 ≤ ξ ≤ 1**

Q)The OLTF of an unity feedback control system is given by G(s) = K/S(S+2) , If k is increased to ∞ then the damping ratio of the system becomes--> **0**

Q)The transient response of the system is mainly due to--> **stored energy**

Q)TF= $\frac{10}{(S+1)(S+5)}$ the step response of a system is-->



Q)For the system 2/(s+1), the approximate time taken for a step response to reach 98% of its final value is--> **4 s**

Q)The initial value of f(t), with transform F(s) = s+1/(s+2)(s+3) is--> **1**

Q)The rise time for c(t)=1-e^{-t} --> **2.2 s**

Q)If the type of the system increases, the steady state error of the system is ..--> **decreases**

Q)If the type of the system increases, the accuracy of the system is ..--> **increases**

Q)Which one of the following is the steady state error of a unity feedback system with TF = $\frac{10}{S^2+10S+10}$--> e_{ss} **= 1**

Q)In the derivation of expression for peak percent overshoot, which one of the following condition is

not required?--> **there is no transportation delay in the system**

Q)The poles of a standard /proto type 2nd order system is at -2+j3. Its damped frequency is--> **3.61 rad/sec**

Q)Static velocity error constant K_v *is*--> $K_v = \lim_{s-0} sG(s)$

Q)Static acceleration error constant $K_a$is--> $K_a = \lim_{s-0} s^2 G(s)$

Q)The proportional controller of a system will--> **either increase or decrease maximum over shoot**

Q)The PD controller of a system will--> **decrease steady state performance only**

Q)The steady state error of a system with P controller is--> **inversely proportional to K_p**

Q)If the type of the system increases, the stability of the system is--> **decreases**

Q)When the gain K of a system is increased , the steady state error of the system--> **decreases**

Q)The transfer function of a system is G(s) = 100/(S+1)(S+100). For a unit step input to system the approximate settling time for 2% Criterion is--> **4 s**

Q)R-L-C circuit shown in

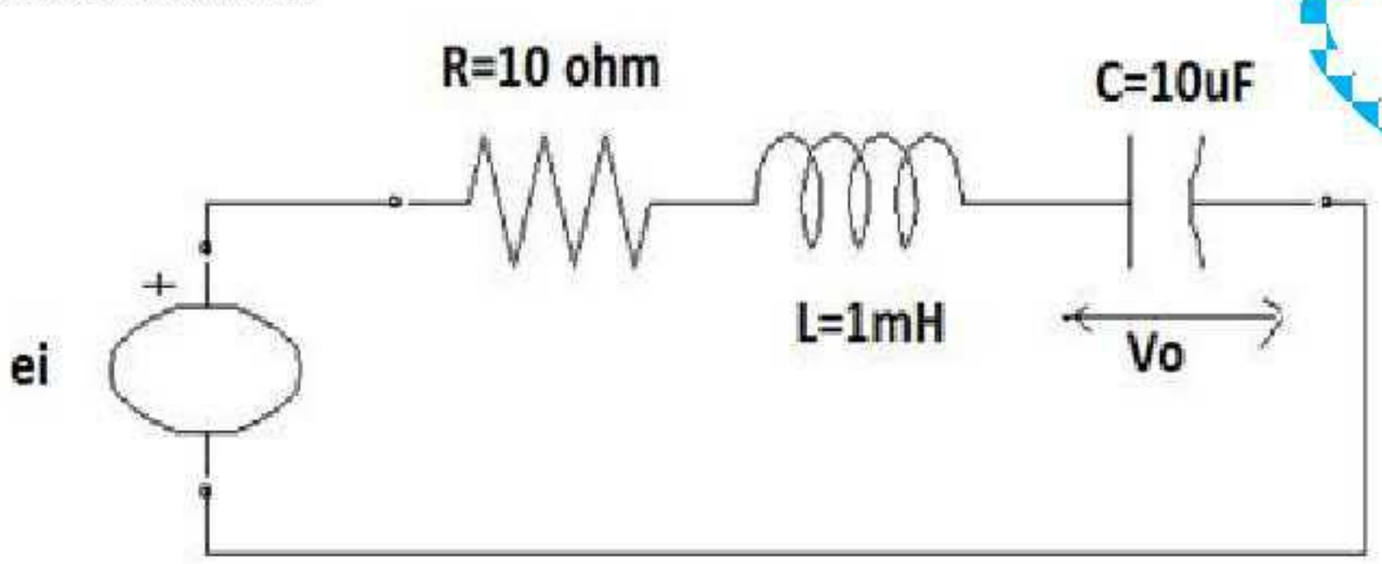


figure For a step input ei, the overshoot in the output eo will be--> **16%**

Q)The addition of PD controller in forward path of a closed loop system will--> **increase the damping ratio & decrease the maximum over shoot**

Q)The addition of PI controller in forward path of a closed loop system will--> **increase the order of overall system by 1 & reduce the steady state error**

Q)The proportional controller of a system will--> **increase maximum overshoot & reduce steady state error**

Q)The PD controller of a system will--> **improve steady state performance only**

Q)The PID controller of a system will--> **improve transient & steady state performance**

Q)The addition of PI controller in forward path of a closed loop system will--> **increase the order of overall system by 1**

Q)The addition of PD controller in forward path of a closed loop system will--> **neither increase nor decrease the order of overall system**