

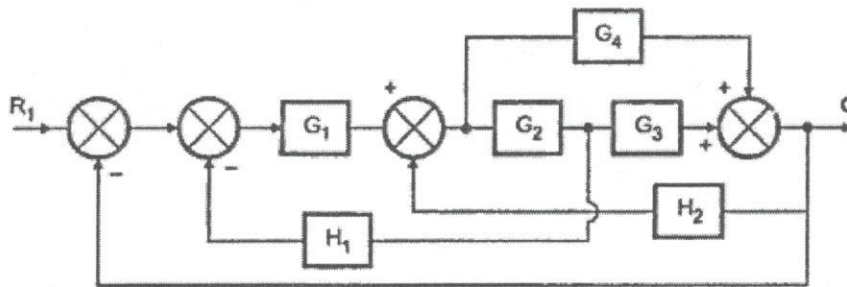
SE (ECS) sem IV 'C' scheme Summer 2015 Exam Date - 19/5/25

Duration: 3hrs

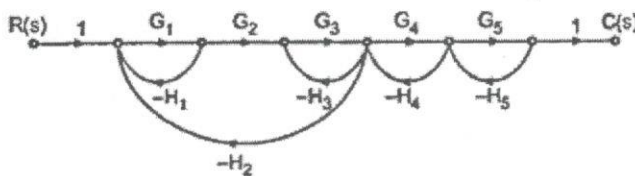
Max Marks:80

- N.B.: (1) Question No 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required and state it clearly.

- 1 Attempt any Four. [20]
 a Explain advantages of digital Control system. [5]
 b A unity feedback system has $G(S) = \frac{K}{s(s+2)(1+0.5s)}$. Determine steady state error [5]
 if $r(t)=3t$ and $k=4$ also calculate K for $ess=0.4$.
 c Explain fiber optic instrumentation. [5]
 d Explain MODBUS protocol [5]
 e Explain working of strain gauge. [5]
- 2 a Using block diagram reduction technique find close loop transfer function of [10]
 given system.



- b Using meson's gain formula find transfer function $\frac{C(S)}{R(S)}$ of given System. [10]



- 3 a Draw the root locus of a unity feedback control system with $G(S) = \frac{K}{s(s+4)(s+6)}$. [10]
 Comment on the stability of the system.
 b Using Routh Harwitz's criterion for the unity feedback system with open loop [10]
 transfer function $G(S) = \frac{K}{s(s+1)(s+2)(s+4)}$ Find
 1) The range of k for stability
 2) The value of k for marginally stable system.

- 4 a A unity feedback system is characterized by an open loop transfer function $G(S) = \frac{K}{s(s+10)}$. Determine the gain k so that the system will have damping ratio of 0.5. For this value of k determine, setting time, peak overshoot and time to peak overshoot for unit step input. [10]
- b Construct the bode plot for given Transfer function $G(S)H(S) = \frac{10(S+10)}{S(S+2)(S+5)}$ [10]
- 5 a Explain Construction and Working of LVDT. Also list applications of LVDT. [10]
- b Explain different types of temperature transducers in detail with suitable diagram. [10]
- 6 a Explain HART communication protocol.. [10]
- b Explain Telemetry system and list types of telemetry system. [10]
