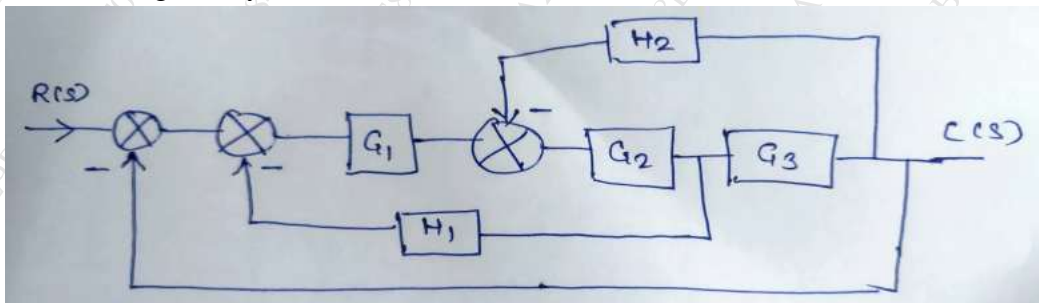


Duration: 3hrs

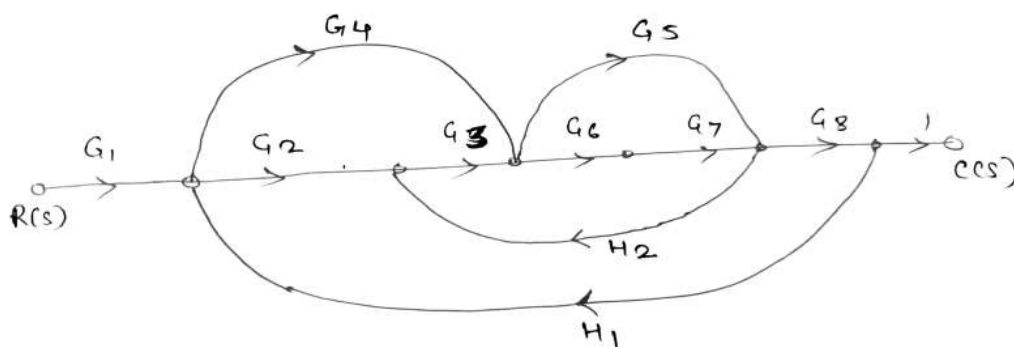
[Max Marks:80]

- 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 the Criteria for the selection of transducers. [5]
 b A unity feedback system has $G(S) = \frac{40(s+2)}{s(s+1)(s+5)}$. Determine [5]
 1. Type of system
 2. All error coefficients
 c Explain HART communication protocol. [5]
 d Differentiate between open loop system and close loop system. [5]
 e Explain the advantages of the digital control system. [5]
- 2 a Using the block diagram reduction technique find the close loop transfer function of given system. [10]



- 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 $G(S) = \frac{K}{S(S+5)(S+10)}$. Comment on the stability of the system. [10]

- b Using Routh Harwitz's criterion for the unity feedback system with open loop transfer function $G(S) = \frac{K}{S(S+1)(S+2)(S+5)}$ Find [10]
- 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 Architecture of SCADA System. [10]
- b Explain Telemetry system and list types of telemetry system. [10]
