



- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Diagrams and Chemical equation should be given wherever necessary.
 5. Illustrate your answers wherever necessary with the help of neat sketches.
 6. Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.

1. a) Enlist various methods of correcting of undesired inputs? Discuss any one method with suitable example. 8
- b) Explain the term: 8
- | | |
|------------------|---------------|
| i) Accuracy | ii) Precision |
| iii) Sensitivity | iv) Linearity |

OR

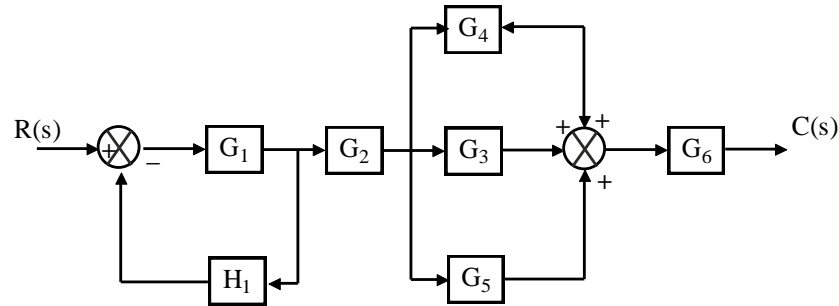
2. a) Draw the response curve for the first order instrument subjected to ramp input. Describe the terms steady state error and transient error. How much is the steady state time lag for the first order systems subjected to ramp input. 8
- b) What is the significance of measurement? What are the various methods of measurement? 8
3. a) Define steady state error. Derive an expression for the steady state error. 8
- b) A system has $G(s)H(s) = \frac{K(s+2)}{s(s^3 + 7s^2 + 12s)}$ 8
- Find:
- | | |
|-------------------|------------------------|
| i) Type of system | ii) All static errors. |
|-------------------|------------------------|

OR

4. a) Find steady state response and error constant for the system whose. 8
- $$G(s) = \frac{40}{s(s+1)(s+4)}$$
- And $H(s) = 1$.
- b) Discuss briefly PID controller. 8
5. a) Sketch and explain working of McLeod gauge. 8
- b) Explain construction and working of LVDT with its advantages. 8

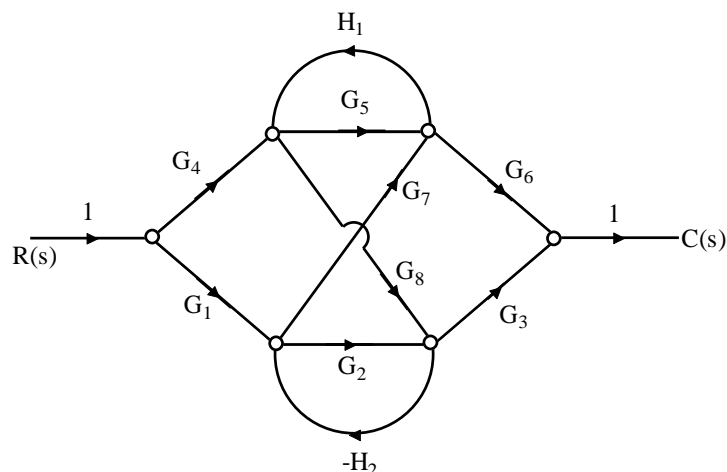
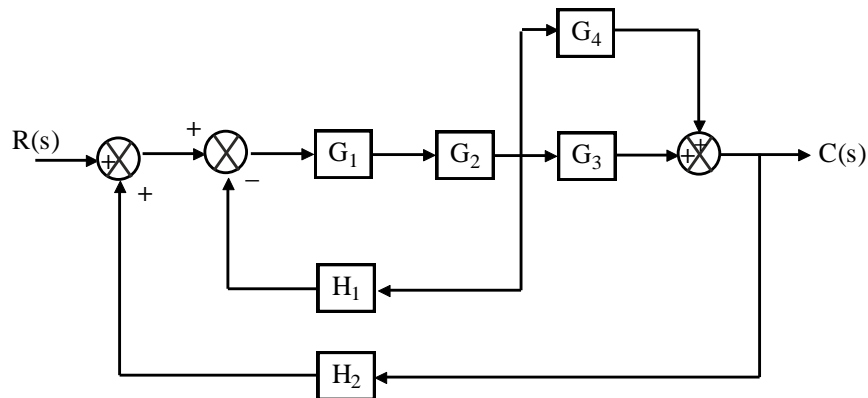
OR

6. a) What do you mean by stroboscope? Explain its working. 8
- b) The 3 cm region between the two plates of a parallel plate capacitor is filled by two 8 dielectric layers. (a) 1 cm thick with dielectric constant 5. (b) 2 cm thick with dielectric constant 10 What would be the relative permittivity (dielectric constant) of a material which given same capacitance if it completely fills the region between the plates? 8
7. a) Differentiate between open loop and closed loop system. 8
- b) Find out Transfer function $C(s) / R(s)$. 8



OR

8. a) Find out Transfer function $C(s) / R(s)$. 8
- b) Find out Transfer function using Mason gain formula. 8



9. a) A unity feedback system has the open loop transfer function $G(s) = \frac{k}{s(s+3)(s+6)}$ plot the Root locus. **10**
- b) Comment on the stability of the system using Routh's criterion for stability **6**
 $s^5 + 2s^4 + 3s^3 + 6s^2 + 2s + 1$

OR

10. For unity feedback system, $G(s) = \frac{80}{s(s+2)(s+20)}$ sketch the Bode plot. Find PM and GM of the system and comment upon the stability of system. **16**
