



# **SNS COLLEGE OF TECHNOLOGY**

**Coimbatore-10**  
**An Autonomous Institution**



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## **DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

### **19ECT212 – CONTROL SYSTEMS**

**II YEAR/ IV SEMESTER**

### **UNIT III – FREQUENCY RESPONSE ANALYSIS**

### **TOPIC 5- SERIES AND PARALLEL COMPENSATORS**



# OUTLINE



- REVIEW ABOUT PREVIOUS CLASS
- WHAT IS COMPENSATORS
- SERIES & PARALLEL COMPENSATORS
- NECESSARY OF COMPENSATION
- ACTIVITY
- METHODS OF COMPENSATION
  - SERIES COMPENSATOR
  - FEEDBACK COMPENSATOR
- SUMMARY



# WHAT IS COMPENSATORS?

## COMPENSATORS:

"A device inserted into the system for the purpose of satisfying the specification is called compensator."

\* Compensators basically introduce pole and/or zero to the system.

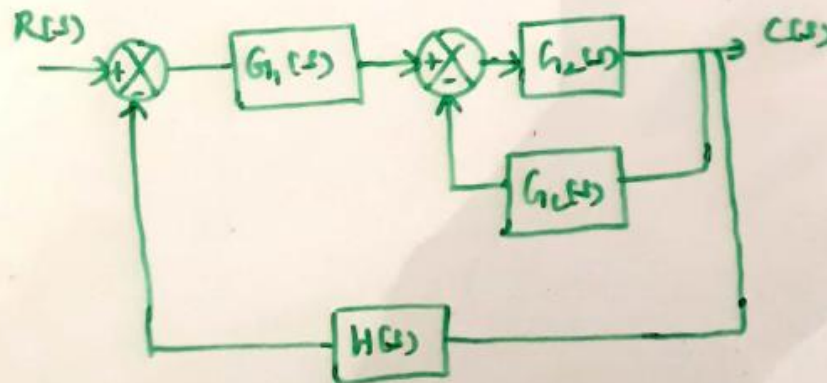
"The design problem is "When a set of specifications are given for a system, then a suitable compensator should be designed so that the overall system will meet the given specification."



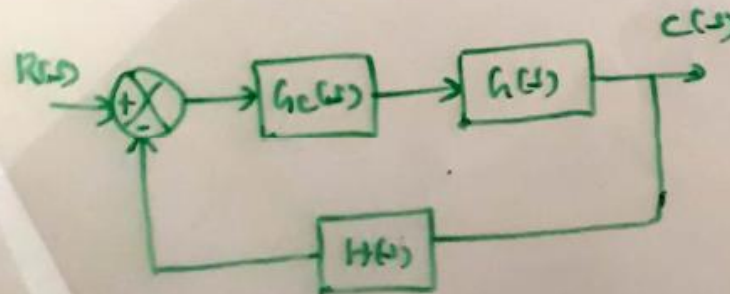
# SERIES & PARALLEL COMPENSATORS?



\* Parallel Compensation + Series Compensation



- Lag Compensator
- Lead Compensator
- Lag-Lead Compensator.





# NECESSARY OF COMPENSATION



1. To obtain the desired performance of the system, we use compensating networks.
2. Compensating networks are applied to the system in the form of feed forward path gain adjustment.
3. Compensate a unstable system to make it stable.
4. A compensating network is used to minimize overshoot.
5. To increase the steady state accuracy of the system.
6. increase in the steady state accuracy brings instability to the system.
7. To introduce poles and zeros in the system thereby causes changes in the transfer function of the system. Due to this, performance specifications of the system change.



# ACTIVITY-IAS QUESTIONS



**Question 1:** If 2 is a company and 3 is the crowd, then what will be 4 and 5?

**Question 2:-** What looks like half an apple?

**Question 3:-** A killer was sentenced to death. Shown three rooms. The first room is on fire, second guns with the killer and the third Tiger-who had not eaten for three years. What should he choose?

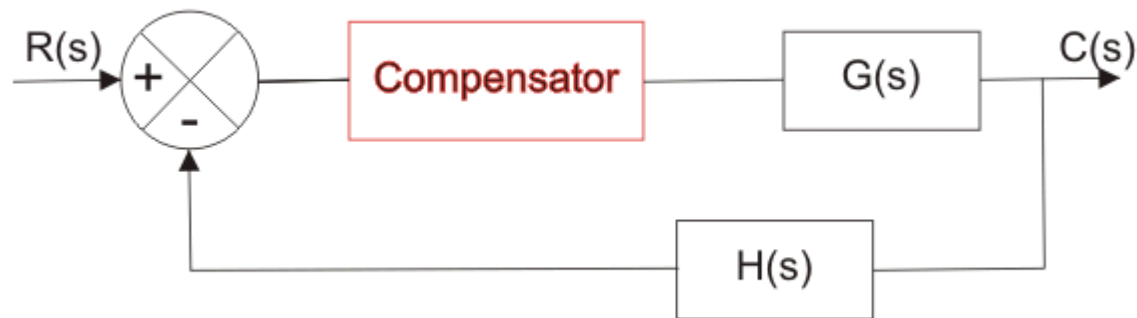
**QUESTION 4:** In which State is the Bay of Bengal?

**QUESTION 5:** Interviewer ordered a cup of coffee for the candidate. Coffee arrived and was kept before the candidate. what is before you?



# METHODS OF COMPENSATION

Connecting compensating circuit between error detector and plants known as **series compensation**.



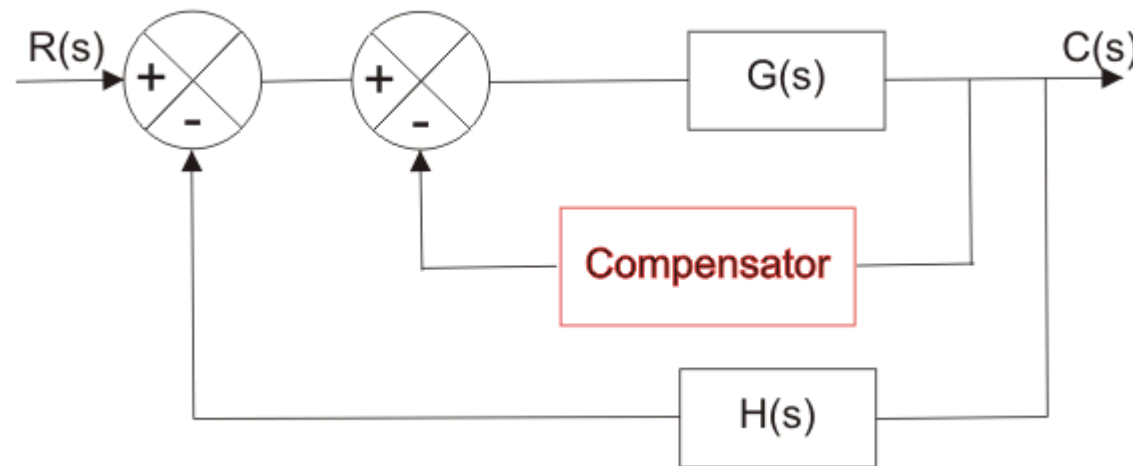
Series Compensator



# METHODS OF COMPENSATION



When a compensator used in a feedback manner called **feedback compensation**.



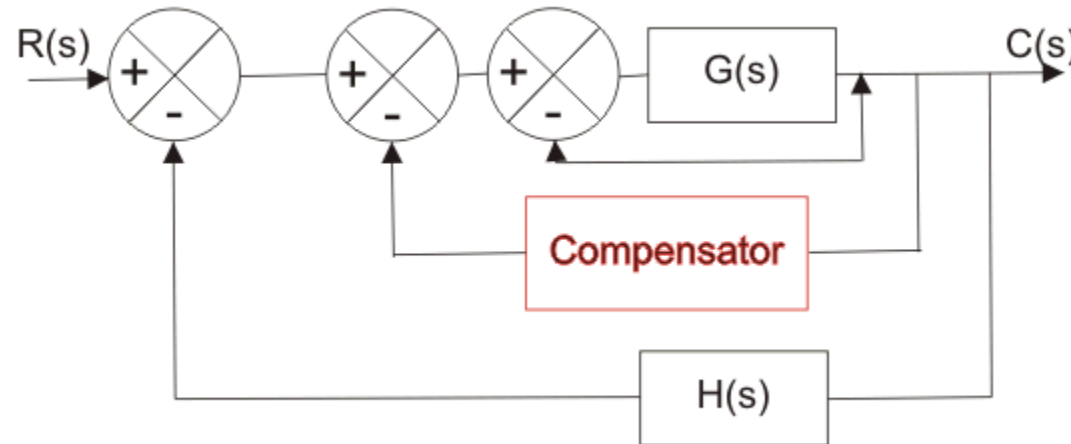
Feedback Compensator





# METHODS OF COMPENSATION

A combination of series and feedback compensator is called **load compensation**.



**Load Compensator** -- A compensating network is one which makes some adjustments in order to make up for deficiencies in the system.

Compensating devices are may be in the form of electrical, mechanical, hydraulic etc.

Most electrical compensator are RC filter. The simplest network used for compensator are known as lead, lag network.



# SUMMARY

