SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

UNIT III

POLAR PLOT

INTRODUCTION

- Polar plot is a plot which can be drawn between magnitude and phase. Here, the magnitudes are represented by normal values only.
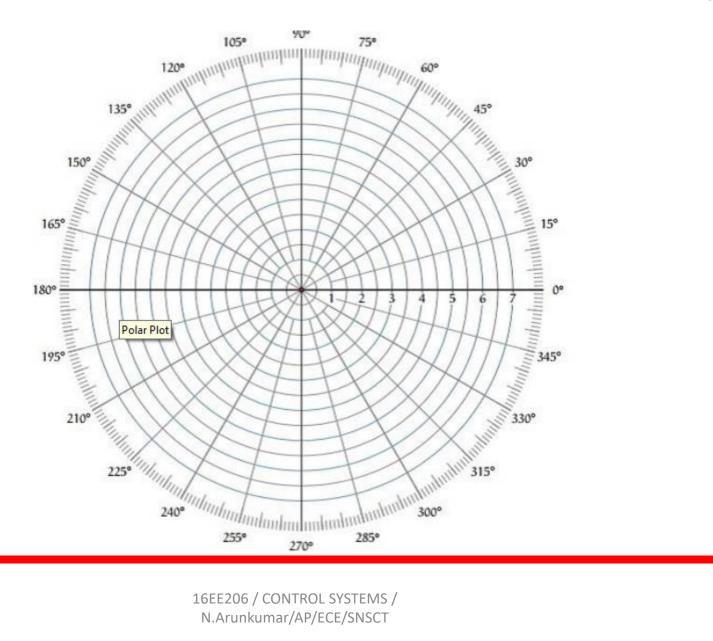
The polar form of $G(j\omega)H(j\omega)$ is

$$G(j\omega)H(j\omega) = |G(j\omega)H(j\omega)|\angle G(j\omega)H(j\omega)$$

- The Polar plot is a plot, which can be drawn between the magnitude and the phase angle of $G(j\omega)H(j\omega)$ by varying ω from zero to ∞.

INTRODUCTION

POLAR PLOT

- The polar plot can be drawn in a polar graph sheet.

- This graph sheet consists of concentric circles and radial lines.

- The concentric circles and the radial lines represent the magnitudes and phase angles respectively.

- These angles are represented by positive values in anti-clock wise direction.

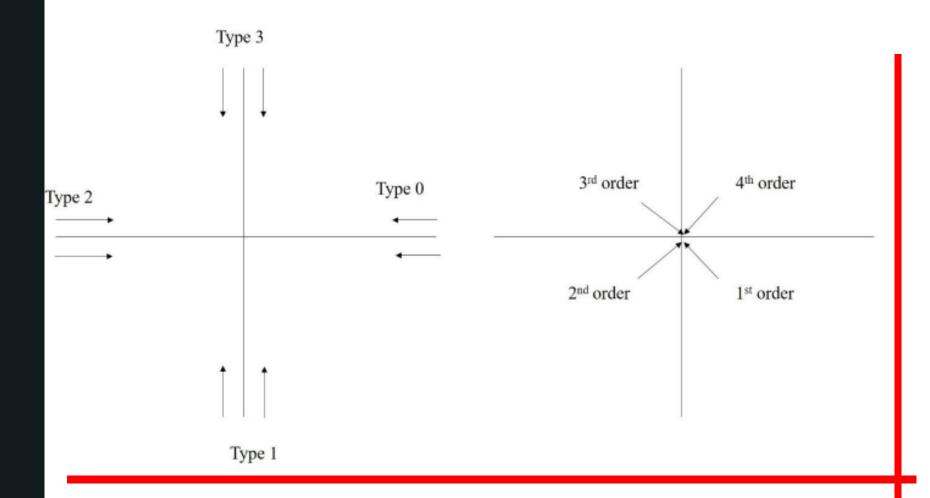- Similarly, we can represent angles with negative values in clockwise direction.

POLAR PLOT

- Alternatively G(jω) can be expressed in rectangular coordinates as

$$G(j\omega) = G_R(j\omega) + jG_I(j\omega)$$

- Polar plot starting coordinate and ending coordinate can be easily identified from the knowledge of type number and order of the system.

POLAR PLOT

POLAR PLOT

- **Advantage** of Polar plot is that it depicts the frequency response characteristics of the system over the entire frequency range in a single plot.

- **Disadvantage** is that the plot does not clearly indicate the contribution of each individual factor of the open loop transfer function.

POLAR PLOT

- https://www.youtube.com/watch?v=stU63ST6ung –Introduction to polar coordinates Animation video

- https://www.youtube.com/watch?v=npy6B-xj4gI - polar frequency response analysis