SAI VIDYA INSTITUTE OF TECHNOLOGY

(Affiliated to VTU, Belgaum, Approved by AICTE, New Delhi and Govt. of Karnataka)
Rajanukunte, Doddaballapur Road, Bangalore-560064
Tel: 080-2846 8196, Fax: 2846 8193 / 98, Web: www.svit.co.in

DEPARTMENT
OF
ELECTRONICS AND COMMUNICATION ENGINEERING
CONTROL SYSTEMS NOTES (15EC43)
(As per Choice based Credit System (CBCS) Scheme)
IVTH SEMESTER

MODULE-4

Syllabus: Frequency domain analysis and stability: Correlation between time and frequency response, Bode Plots, Experimental determination of transfer function. Introduction to Polar Plots, (Inverse Polar Plots excluded) Mathematical preliminaries, Nyquist Stability criterion, (Systems with transportation lag excluded) Introduction to lead, lag and lead-lag compensating networks (excluding design).

Study Material Referred:

- ✓ Modern Control engineering-K Ogata.
- ✓ Control Systems Engineering- J.Nagarath and M.Gopal.
- ✓ Automatic Control Systems-Benjamin C. Kuo.
- ✓ Linear Control Systems –B S Manke.
- ✓ Control Systems- Anand Kumar.
- ✓ **VTU Previous year Question papers (2010-2016)**.
- ✓ Control Systems- BAKSHI.

Compiled By:

Prashanth N
Assistant professor
Dept. of ECE
Mail : Prashanth09827@gmail.com
Phone: +91-9538766317

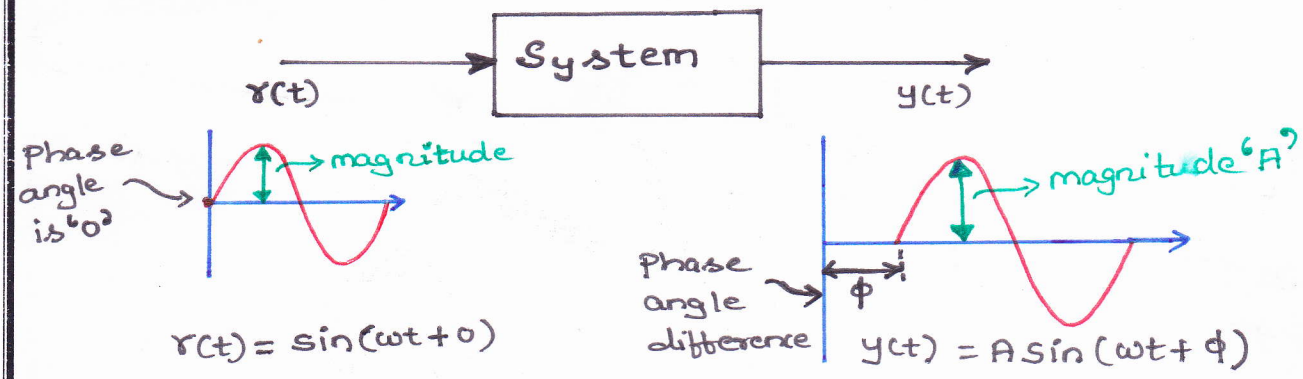
Module 4:- Frequency Domain Analysis And Stability

Defination :-

* Frequency Domain Analysis is defined as the steady state response of a system due to a sinusoidal input.

or

* The output variation w.r.t frequency by applying standard input which is sinusoidal signal is known as frequency response analysis.



* Consider a linear system, with a sinusoidal input

$$r(t) = \sin(\omega t + 0)$$

* The steady-state output of the system, y(t), will be a sinusoid with the same frequency 'ω', but possibly with different amplitude 'A' and phase 'ϕ'; that is,

$$y(t) = A \sin(\omega t + \phi)$$

Note :-

a) In time response only magnitude is a Variable term

b) In frequency response both magnitude and phase are Variable terms.