SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

UNIT IV

ROOT LOCUS

INTRODUCTION

- The Root locus is the locus of the roots of the characteristic equation by varying system gain K from zero to infinity.
- We know that, the characteristic equation of the closed loop control system is

$$1+G(s)H(s)=0$$

- The points on the root locus branches satisfy the angle condition. So, the angle condition is used to know whether the point exist on root locus branch or not. We can find the value of K for the points on the root locus branches by using magnitude condition.

INTRODUCTION

- Characteristic equation of closed loop control system is

$$1+G(s)H(s)=0$$

$$\Rightarrow G(s)H(s)=-1+j0$$

- The **phase angle** of G(s)H(s)G(s)H(s) is

$$\angle G(s)H(s)=\tan^{-1}(0/1)=(2n+1)\pi$$

- The **angle condition** is the point at which the angle of the open loop transfer function is an odd multiple of 180^0.

INTRODUCTION

- Magnitude of G(s)H(s)G(s)H(s) is –

$$|G(s)H(s)| = 1$$

- The magnitude condition is that the point (which satisfied the angle condition) at which the magnitude of the open loop transfer function is one.