Guru Tegh Bahadur Institute of Technology

Department of Electronics and Communication

Assignment 1

Control System

DOA ------------------- DOS -------------------

**Q1.** What are the main advantages of Bode plot?

**Q2.** What is minimum phase system?

**Q3**. What is non-minimum phase transfer function?

**Q4**. Plot the Bode diagram for the following transfer function and obtain the gain and phase cross over frequencies. G(S) = 10/ S (1+0.4S) (1+0.1S)

**Q5.** The open loop transfer function of a unity feedback system is G(S) = 1/ S (1+S) (1+2S).

Sketch the Polar plot and determine the Gain margin and Phase margin

**Q6.** Sketch the polar plot for the following transfer function .and find Gain cross over frequency, Phase cross over frequency, Gain margin and Phase margin.

G(S) = 400/ S (S+2) (S+10)

**Q7.** Sketch the Bode plot and hence find Gain cross over frequency, Phase cross over Frequency, Gain margin and Phase margin.

G(S) = 10(1+0.1S)/ S (1+0.01S) (1+S).

**Q8.** Construct the polar plot for the function GH(S) =2(S+1)/ S2. Find Gain cross over frequency, Phase cross over frequency, Gain margin and Phase margin

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Assignment 2

Control System

DOA ------------------- DOS -------------------

**Q1.** What is the necessary and sufficient condition for stability?

**Q2.** What are the effects of adding a zero to a system?

**Q3.** What are the main significances of root locus?

**Q4.** A unity feedback control system has an open loop transfer function

G(S) = K / S (S2+4S+13).Sketch the root locus.

**Q5.** Sketch the root locus of the system whose open loop transfer function is

G(S) = K / S (S+2)(S+4).Find the value of K so that the damping ratio of the closed loop system is 0.5

**Q6.** Draw the Nyquist plot for the system whose open loop transfer function is

G(S) = K / S (S+2) (S+10).Determine the range of k for which closed loop system is stable.

**Q7.** Construct Routh array and determine the stability of the system represented by the characteristics equation S5+S4+2S3+2S2+3S+5=0.Comment on the location of the roots of characteristic equation.