

Course Title: Control System I

Course Code: EE 411

Sheet #3

1- Draw the bode amplitude and phase plots for the following unity feedback systems:

a) $G(s) = \frac{20(s+1)}{(s+100)}$

b) $G(s) = \frac{2000s(s+1)}{(s+100)^2}$

c) $G(s) = \frac{5 \cdot 10^8 s(s+100)}{(s+20)(s+1000)^3}$

d) $G(s) = \frac{1000s^2}{(s^2+5s+100)}$

e) $G(s) = \frac{(s+0.5)}{s(s+10)}$

f) $G(s) = \frac{2(0.2+s)(0.1+s)}{s^2(1+4s)(1+0.25s)}$

g) $G(s) = \frac{1}{s(1+0.1s)\left(1+\frac{30}{625}s+\frac{s^2}{625}\right)}$

2- From problem (1) determine the required K so that each system has a positive phase margin of 45° .

3- From problem (1) determine the maximum possible value of K for stability.