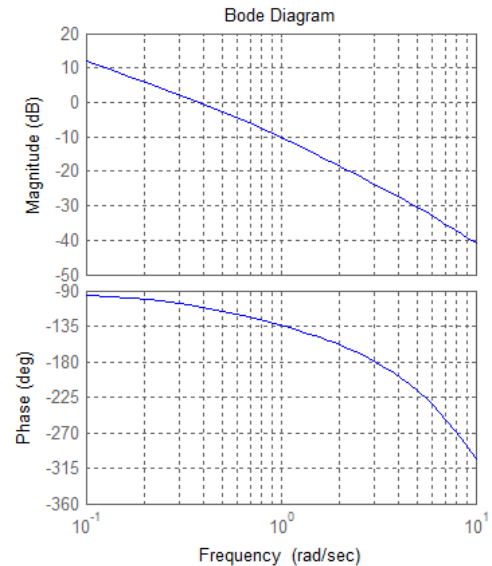


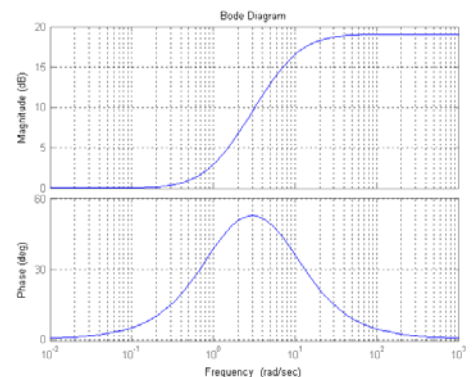
ESE 406/505 & MEAM 513 – 2013-Apr-03 – Quiz – Name: _____

- Choose the one best answer for each question by circling the letter.
 - A correct answer is worth 2 points.
 - No answer is worth 0 points.
 - An incorrect answer is worth -1 point. Random guessing will lower your score, on average.
- A system is designed with a conservative gain margin of just under 12dB. Which of the following statements is MOST ACCURATE about the closed-loop stability of the actual system?
 - If the actual gain of the loop transfer function is greater than 12dB at any frequency, the closed-loop system will be unstable.
 - If the actual gain of the loop transfer function is less than -12dB at any frequency, the closed-loop system will be unstable.
 - If the actual gain of the system is larger than expected by a factor of 4 or more, the closed-loop system will be unstable.
 - If the actual gain of the system is smaller than expected by a factor of 4 or more, the closed-loop system will be unstable.

- In the bode plot shown in the figure at right, the phase margin is approximately...
 - ...70 deg
 - ...45 deg
 - ...1.8 rad/sec
 - ...0.4 rad/sec



- The gain margin shown in the figure is approximately...
 - 36 dB
 - 24 dB
 - 9 dB
 - 3 dB
- For the loop bode plot shown at right, how much additional time delay in the loop transfer function would cause the closed-loop system to be neutrally stable?
 - About 3.0 sec.
 - About 1.6 sec.
 - About 0.4 sec.
 - This system cannot be made unstable with additional time delay.



- The frequency response shown at right matches which of the following transfer functions?
 - $\frac{9s + 9}{s + 9}$
 - $\frac{s + 9}{9s + 9}$
 - $\frac{9s}{s + 9}$
 - $\frac{s + 9}{s}$