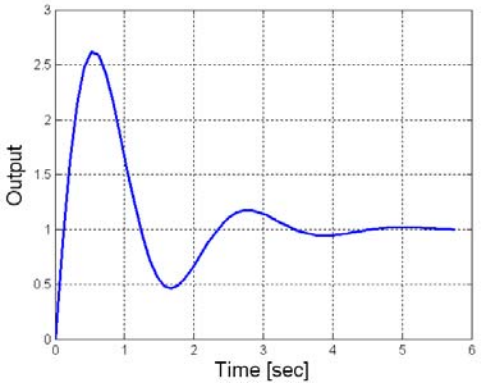
ESE 406/505 & MEAM 513 – 2012-Feb-22 – Quiz – Name:_____

- Choose only one 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.

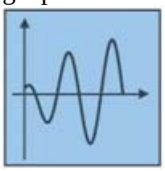
1. Which of the following is the BEST ESTIMATE of the transfer function whose step response is shown at right?

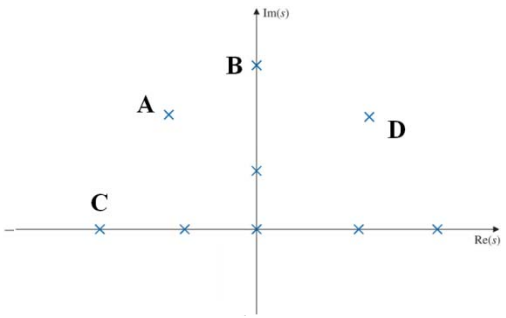


   A. $\frac{9}{s^2+9}$.
   B. $\frac{9}{s^2+6s+9}$
   C. $\frac{9s}{s^2+2s+9}$
   D. $\frac{9s+9}{s^2+2s+9}$

2. Which of the following is MOST CORRECT concerning the unit step response of the transfer function $\frac{4s+8}{(s^2+s+4)(s+1)}$?
   A. The steady-state value of the output will be 4.
   B. The first-order zero in the numerator will dramatically reduce the peak overshoot.
   C. The value of the second derivative of the output at t=0+ will be 4.
   D. None of the other answers is correct.

3. Match the transient response shown below to the corresponding letter identifying a pole in the complex plane at right.





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4. Which of the following is MOST ACCURATE about the step response of $Y(s)=\frac{6(s+5)}{(s+1)(s+6)}U(s)$?
   A. The proximity of the zero at -5 to the pole at -6 will make the amplitude of the response of associated with the pole at -6 small.
   B. The steady-state amplitude of the response will be 30.
   C. The system is unstable because of the zero in the right half-plane.
   D. All of the other answers are correct.

5. Which of the following correctly identifies a time-domain specification in the figure at right?
   A. Rise Time.
   B. Peak Oveshoot.
   C. Settling Time.
   D. Peak Time.