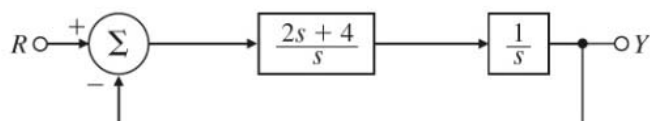


# ESE 406/505 & MEAM 513 – 2012-Feb-08 – Quiz – Name: \_\_\_\_\_

- 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 hurt you.

1. Which of the following is the transfer function corresponding to the figure at right?



- A.  $\frac{Y(s)}{R(s)} = \frac{2s + 4}{s^2 + 2s + 4}$
- B.  $\frac{Y(s)}{R(s)} = \frac{s^2 - 2s - 4}{s^2}$
- C.  $\frac{Y(s)}{R(s)} = \frac{2s + 4}{s^2}$
- D. None of the other answers.
2. Which of the following is the correct transfer function for  $\tau \frac{dy}{dt} + 2y = \tau \frac{du}{dt}$ ?
- A.  $\frac{Y(s)}{U(s)} = \frac{\tau s}{\tau s + 2}$
- B.  $\frac{Y(s)}{U(s)} = \frac{\tau}{\tau + 2s}$
- C.  $\frac{Y(s)}{U(s)} = \frac{\tau}{\tau + 2}$
- D. It depends on the initial values of y and u.
3. Which of the following is MOST CORRECT about the poles of  $\frac{Y(s)}{R(s)} = \frac{s + 4}{s^2 + 3s + 9}$ ?
- A. The poles are second order with a natural frequency  $\omega_n = 3$
- B. None of the other answers is correct.
- C. There is one real pole at  $s = -4$
- D. The poles are second order with damping ratio  $\zeta = 0.1$
4. What is the magnitude of the steady response to a unit step input for the system in the previous question?
- A. There is no steady response because the system is unstable.
- B. The steady response is  $y = 1/9$
- C. The steady response is  $y = 4/3$
- D. The steady response is  $y = 4/9$

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

