ESE 406/505 & MEAM 513 – 2013-01-30 – Quiz – Name:_____

- Choose only one answer (A through D) 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 grade on average.

1. We use Laplace Transforms because they...
   A. ...convert Fredholm Equations of the second kind into integers.
   B. ...none of the other answers.
   C. ...convert nonlinear equations into linear equations.
   D. ...convert linear constant-coefficient ODEs into algebraic equations.

2. Which of the following is the correct expression for the Laplace Transform of $\tau \frac{dy}{dt} + 2y$?
   A. $(\tau s + 2)Y(s) - \tau y(0)$
   B. None of the other answers.
   C. $(\tau + 2s)Y(s) - \frac{dy}{dt}(0)$
   D. $(\tau + 2)Y(s) - 2sy(0)$

3. Which of the following is the correct partial-fraction expansion of $Y(s) = \frac{6}{(s+1)(s-2)}$?
   A. $Y(s) = \frac{6}{(s+1)} + \frac{3}{(s-2)}$
   B. $Y(s) = \frac{-2}{(s+1)} + \frac{2}{(s-2)}$
   C. None of the other answers.
   D. $Y(s) = \frac{-1}{(s+1)} + \frac{2}{(s-2)}$

4. The transfer function of a linear state-space system, $\dot{\underline{x}} = A\underline{x} + Bu$ & $y = C\underline{x} + Du$, is...
   A. None of the other answers.
   B. $H(s) = sCA^{-1}B + D$
   C. $H(s) = \frac{As^2 + Bs + C}{D}$
   D. $H(s) = C(sI - A)^{-1}B + D$

5. The Laplace transform of $f(t) = 2e^{-3t}$ is...
   A. $F(s) = \frac{2}{s+3}$
   B. $F(s) = \frac{3}{s^2}$
   C. $F(s) = 2e^{-3s}$
   D. $F(s) = 6s$