ESE 406/505 & MEAM 513 – 2011-Jan-31 – 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 hurt you.

1. Which of the following complex number is equal to $(1+j)^2$

   A. $1-j$
   B. $2+2j$
   C. $2j$
   D. None of the above.

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. $(\tau+2s)Y(s)-\frac{dy}{dt}(0)$
   C. $(\tau+2)Y(s)-2sy(0)$
   D. None of the above.

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. $Y(s)=\frac{-1}{(s+1)}+\frac{2}{(s-2)}$
   D. None of the above.

4. Which of the following is a trim (or equilibrium) condition for the system $\frac{dx}{dt}=-\sqrt{x}+\sin u$?

   A. $\frac{dx_o}{dt}=-\sqrt{x_o}$
   B. $\frac{dx_o}{dt}=-\sin u_o$
   C. $\sqrt{x_o}=\sin u_o$
   D. None of the above.

5. Which of the following statements is NOT correct concerning the linearization $\Delta\dot{\underline{x}}\approx A\Delta\underline{x}+B\Delta u$ of the non-linear system $\dot{\underline{x}}=\underline{f}(\underline{x},u)$:

   A. A is a row (1-by-n) vector.
   B. B is a column (n-by-1) vector (because we are considering only one control input).
   C. A and B depend on the trim (equilibrium) condition.
   D. $\Delta\underline{x}$ and Δu are small perturbations, measured from the trim condition.