# ECE 2704: Signals & Systems

**Summer-I 2004, 3 credits, CRN: 60318**

Test#4

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1. Find the inverse Laplace transform of (10 points)

$$X(s) = \frac{s^3 + 2s^2 + 6}{s^2 + 3s}, \mathrm{Re}(s) > 0$$

2. Consider an LTI system for which the input $x(t)$ and the output $y(t)$ are related by

$$y''(t) + y'(t) - 2y(t) = x(t)$$

   (a) Find the system function $H(s)$. (5 points)

   (b) Determine the impulse response $h(t)$ when it is know that the system is causal (i.e. $h(t)$ is a right sided signal). (5 points)

3. If a continuous-time LTI system is BIBO stable, then show that the ROC of its system function H(s) must contain the imaginary axis. (5 points)

4. Find the overall system transfer function for the shown feedback block diagram. (5 points).