EECS660 **HW3** **Due: 9-25-14**

Instruction: Read and follow the Homework Submission Policy carefully. You must show all your work clearly for credit. Partial credit will only be given to meaningful answers.

1. (15) Solve the following HLRECC and then verify your solution using (strong) induction.

$$t_0 = 0,\ t_1 = 1,$$
$$2t_n + 5t_{n-1} - 12t_{n-2} = 0, n > 1.$$

2. (15) Solve the following HLRECC and then verify your solution using backward substitutions.

$$t_0 = 0,\ t_1 = 1,\ t_2 = 2,$$
$$t_n - 3t_{n-1} - t_{n-2} + 3t_{n-3} = 0, \forall n > 2.$$

3. (15) Guess and verify a particular solution p(n) and then use it to solve the following IHLRECC for t_n.

$$t_0 = 0,\ t_1 = 1,$$
$$t_n - 5t_{n-1} + 6t_{n-2} = 3^n, \forall n > 1.$$

4. (15) Use Theorem 8 to compute a particular solution p(n) and then use it to solve the following IHLRECC for t_n.

$$t_0 = 0,\ t_1 = 1,$$
$$t_n - 3t_{n-1} - 4t_{n-2} = 4^n, \forall n > 1.$$

5. (20) Use Theorem 9 to construct the characteristic equation for the following IHLRECC and then solve it for t_n.

$$t_0 = 0,\ t_1 = 1,$$
$$t_n - 5t_{n-1} + 6t_{n-2} = 2^{n-3}(1-n), \forall n > 1.$$

6. (20) Transform the following recurrence equation into a LRECC and then solve it for $T(n)$.

$$T(1) = 0,$$
$$T(2) = 1,$$
$$T(n) = 3T(\frac{n}{2}) + 4T(\frac{n}{4}) + 5n, n = 2^k > 2.$$

Remark: Turn in Problems 2, 4, and 6 for grading.