

# Math 385, Section M1

## Homework 11

Due April 26, 2007, before class

**Problem I:** Find the Fourier Series of the particular solution  $x_p(t)$  of the equations:

(i)  $x'' + 4x = F(t)$  where  $F$  is the even function of period 4 such that  $F(t) = 2t$ ,  $0 \leq t \leq 2$ ;

(i)  $x'' + 10x = F(t)$  where  $F$  is the odd function of period 2 such that  $F(t) = t - t^2$ ,  $0 \leq t \leq 1$ ;

**Problem II:** Textbook page 606, Exercises: 7, 8;

**Problem III:** Textbook page 606, Exercise: 18;

**Problem IV:** Textbook page 618, Exercises: 1, 2;

**Problem V:** Textbook page 618, Exercises: 17, 18.

**Optional Problem: Turn it in separately.** Find the solution of the problem

$$\begin{aligned}u_t &= u_{xx} + e^{-t}x, & t > 0, 0 < x < 1 \\u(t, 0) &= 1, u(t, 1) = 2, & t > 0 \\u(0, x) &= 1, & 0 \leq x \leq 1.\end{aligned}$$