

## MATH 442 - FINAL EXAM, FALL 2005

- Date: Sat, Dec 17, 8:00 – 11:00 am
- Room: 140 Henry
- Chapters: everything covered in the course
- Office Hours: MWF 3:30-4:30 pm, TT 10-11 am

It is very important for you to understand lecture notes and homework thoroughly so that you can mimic them on the test.

You may bring paper (three pages of letter size) of notes including formulas. No formulas sheet will be given.

### Checklist for chapters 6 – 12

- (1) Do you know definitions of Laplace equation, harmonic function, Poisson's equation, delta function, Heaviside function, Bessel's equation, Bessel's function, spherical harmonics etc?
- (2) Can you state and use maximum principle on harmonic functions? Where else did you have maximum principle and what is different?
- (3) Can you solve PDEs including  $\Delta u$  as in your homework?
- (4) Can you solve Laplace equation on a disk, ball, rectangle, or box by separation of variables?
- (5) What is Poisson's formula? Can you state and use mean value property?
- (6) Can you solve Poisson's equation on  $\mathbb{R}^3$ ?
- (7) What is Fourier transform and its inverse? Can you find them? What is the convolution? Can you say and use properties of Fourier transform? Can you solve PDEs using Fourier transform?