1. (10 pts) Jackson Problem 7.22.

2. (10 pts) Jackson Problem 8.4 (a) (Hint: the solution involves Bessel functions. Use the known roots of Bessel functions from Jackson for “numerical” part.)

3. (10 pts) Consider a TM mode in a rectangular waveguide. Given $E_z$ for this mode (see the footnote on page 362 of Jackson), find $E_x$, $E_y$, $H_x$, $H_y$ using either Maxwell equations or the formulas derived in class.

4. (10 pts) Jackson Problem 8.5 (a). (Find the electric and magnetic fields of the modes, not just frequencies.)