

PHYS 703 Test 2
October, 2013

1. [10 points]

A dielectric cylinder, of radius R and length L , is centered at the origin and is uniformly polarized. The polarization is parallel to its axis, which is the z -axis. What are the bound charge densities for this cylinder? What is the electric potential at points far from the origin, and what is the electric field there?

2. [10 points]

Consider a circular loop of radius a , centered at the origin, lying in the x - y plane and carrying current I along the $\hat{\phi}$ direction. Find the magnetic vector potential and the magnetic field at a point on the positive z -axis.