EENG232
ELECTROMAGNETICS 1
HW2

Date: 05/05/2017 Due: 15.05.2017

1) A conducting sphere of radius a is centered at the origin and embedded in a dielectric material with permittivity $\varepsilon = \varepsilon_r \varepsilon_0$ for a<r<b. If the sphere carries a surface charge of ρ_s (C/m^2), find $\bar{E}$, $\bar{D}$, $\bar{P}$ and V everywhere. Also, evaluate the polarization volume and surface charge densities.

2) Let $$\rho_v = \begin{Bmatrix} \frac{10}{r^2}, & 1 < r < 4 \\ 0, & r > 4 \end{Bmatrix} C/m^3$$

a) Find the net electric flux crossing surface r=2m and r=6m.
b) Determine $\bar{D}$ at r=1m and r=5m.