

## 1 Total Charge

For each case below, find the total charge.

- (a) A positively charged (dielectric) spherical shell of inner radius  $a$  and outer radius  $b$  with a spherically symmetric internal charge density

$$\rho(\vec{r}) = 3\alpha e^{(kr)^3} \quad (1)$$

- (b) A positively charged (dielectric) cylindrical shell of inner radius  $a$  and outer radius  $b$  with a cylindrically symmetric internal charge density

$$\rho(\vec{r}) = \alpha \frac{1}{s} e^{ks} \quad (2)$$