

classmate
Date _____
Page _____

Due: 06/02/23 Assignment 1 (80 points)

1. Zangwill, Problem 2.5 (7 points)
2. Zangwill, Problem 2.6 (4 + 6 + 3 = 13 points)
3. Zangwill, Problem 2.14 (10 points)
4. Zangwill, Problem 3.2 (5 + 5 = 10 points)
5. Zangwill, Problem 3.6 (10 points)
6. Suppose a spherical shell of radius R has uniform σ . Find $\phi(r)$ everywhere. (10 points)

7. An infinite co-axial cable is a solid cylindrical volume of radius a and a outer cylindrical shell of radius b ($b > a$). It carries a uniform charge density ρ in the inner cylinder and a uniform surface charge density σ on the outer cylinder. Find \vec{E} and plot (i) the electric field ($|\vec{E}|$) everywhere if the cable as a whole is charge

neutral. ($\rho > 0, \sigma < 0$).

(ii) The electric potential everywhere

(iii) Show that the matching conditions for \vec{E} and ϕ are satisfied at all interfaces.

(7+5+8=20)