PHYSICS 507 3rd HOMEWORK-SPRING 2020 Solutions Dr. V. Lempesis

Hand in: Sunday 16th of March 2020, time: 23:59

- 1. Two concentric spherical shells have radii a, b: (a < b). The two shells have opposite charges +Q, -Q and the space between is empty. This is a spherical *capacitor*. Find:
 - (i) The electric field in the area between the two shells.
 - (ii) The potential difference between the two shells.
 - (iii) The capacitance of the capacitor
 - (iv) The capacitance expression when $b a \ll a$.
 - (v) The capacitance when *b* is very large.
 - (vi) The energy of the capacitor.

(12 points)

(8 points)

2. Find the potential in the region between the two semi-infinite charged planes which have a potential V=0. The planes are as shown in figure. The position of the charge is at (a, b).

