

**Homework 7**  
**EE381-1 Electric & Magnetic Fields (Fall 2018)**  
**Friday, October 5, 2018**

- 1) 4.3
- 2) 4.10
- 3) 4.17
- 4) 4.21
- 5) A flat circular ring, located at  $0.02 \text{ m} < \rho < 0.05 \text{ m}$ ,  $z = 0.1 \text{ m}$  in free space, has a uniform surface charge density of  $-2 \text{ } \mu\text{C}/\text{m}^2$ . Find the electric field and electric flux density vector at the point  $\rho = 0$ ,  $z = -0.2 \text{ m}$ . Sketch the problem geometry, including field and position vectors. If a  $1 \text{ } \mu\text{C}$  point charge is placed at this point, what force does it experience?
- 6) A uniform surface charge density of  $-10 \text{ } \mu\text{C}/\text{m}^2$  is found on the surface described by  $r = 30 \text{ cm}$ ,  $0 \leq \theta < \pi/3$ , and  $0 \leq \phi < 2\pi$  in free space. Find the electric field and electric flux density vectors at the spherical point  $P(0.1 \text{ m}, 0, 0)$ . If a  $6 \text{ } \mu\text{C}$  point charge is placed at point  $P$ , what force does it experience?

**Due Friday, October 12, 2018.**