

# ELECTROSTATICS

## Chapter 16-17 Assigned Reading, Problems, and Answers

### ASSIGNMENTS

Ch. 16 Problem Assignment Pt. 1: HW due: \_\_\_\_\_

Work textbook pg. 465-466 Problems #1-3, 6, 8, 12-14a, 16a, 20-21a, 22

Ch. 16 Problem Assignment Pt. 2: HW due: \_\_\_\_\_

Work textbook pg. 466-469 Problems #23-28, 31-33, 36, 38a, 40-41a, 67, 68

Ch. 17 Problem Assignment Pt. 1: HW due: \_\_\_\_\_

Work textbook pg. 489-491 Problems #1-6, 11-12, 14-16, 19-22

Ch. 17 Problem Assignment Pt. 2: HW due: \_\_\_\_\_

Work textbook pg. 489-491 Problems #31-32, 34-37, 39-44, 47-49

### ANSWERS

Ch. 16 During-Chap #1:

1. 13.47N

2.  $1.87E^{14}$  electrons

3. 0.0027N

6. 2.0N

8.  $2.6E^{14}$  electrons,  $2.4E^{-16}$  kg

12.  $F_{75} = 147.4\text{N}$  to left

$F_{48} = 564.3\text{N}$  to right

$F_{85} = 416.9\text{N}$  to left

13.  $F_1 = 83.8\text{N}$  in +y direction

$F_2 = 83.8\text{N}$  @  $30^\circ$  below -x axis

$F_3 = 83.8\text{N}$  @  $30^\circ$  below +x axis

14.  $F_1 = 6.21E^7\text{N}$  @  $45^\circ$  above -x axis

16a.  $10.1 \frac{kQ^2}{L^2}$  @  $61.3^\circ$  above +x axis

20. 119cm beyond negative charge

21.a.  $6.815E^{-5}\text{C}$ ,  $2.185E^{-5}\text{C}$

22.  $1.03E^{12}$  electrons

**Ch. 16 During-Chap #2:**

23.  $3.78E^{-16}$  N west
24.  $2.34E^5$  N/C south
25.  $9.5E^5$  N/C up
26.  $7.42E^6$  N/C up
27.  $1.32E^{14}$  m/s<sup>2</sup> opposite to the field
28.  $8.4E^7$  N/C towards the neg. charge
31.  $6.54E^{-10}$  N/C south
32.  $2.65E^{-10}$  C
33.  $4.7E^6$  N/C, directed diagonally away from pos. charge, and toward opposite-corner neg charge.
36. 29cm
38.  $E_A = 4.5E^6$  N/C upward
40.  $\frac{2kQa}{(x^2 + a^2)^{3/2}}$  in the -y direction
- 41.a.  $7.49E^6$  m/s
67.  $+6.5E^{-7}$  C
68.  $1.06E^7$  N/C directed downward

**Ch. 17 During-Chap #2:**

31.  $2.94\mu$  F
32. 17.4V
34.  $84\mu$  C
35.  $4.97E^7$  m<sup>2</sup>
36.  $0.75\mu$  F
37.  $2.63E^{-8}$  C
39. 45,000 N/C
40.  $5.65E^{-5}$  F
41. 0.00177C, 0.0048C, 708V

**Ch. 17 During-Chap #1:**

1.  $4.24E^{-4}$  J
2.  $2.88E^{-17}$  J, 180eV
3.  $3.68E^{-15}$  J,  $2.3E^4$ eV
4. +4,656V (so plate B is @ higher potential)
5. 37,931 V/m
6. 7.04V
- 11.a.  $1.62E^7$  m/s  
b.  $3.35E^7$  m/s
12.  $7.83E^5$  m/s
14. 240,000V
15. 2.08nC
16. 2.53J
19.  $\frac{1.707kQ}{L}$
20.  $3.49E^7$  m/s
21. 4,815m/s
- 22.a. 22.25cm from  $-2\mu$ C charge (measured away from  $3\mu$ C charge)  
b. 2cm from  $-2\mu$ C charge (measured toward the  $3\mu$ C charge) and 10cm from  $-2\mu$ C charge (measured away from the  $3\mu$ C charge)

42.  $3.27E^{-11}$  F

43.  $1.52E^{-10}$  F

44.  $4.62E^{-7}$  C

47.  $9.6E^{-5}$  F

48. 2,333J

49.a.  $7.29E^{-12}$  F

b.  $6.56E^{-11}$  C

c. 180 V/m

d.  $2.95E^{-10}$  J

e. capacitance, charge, work