

Estat #1 p 523 MC 1, 2, 3, 4
C 23

p 524 Problems 1, 2, 6, 7

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p 523 - Multiple Choice

(10)

1) Which of the following occurs when two objects are rubbed against each other?

- a) Both acquire same charge
- b) ~~B~~ They acquire opposite charge
- c) No new charges are created
- d) Both b + c

2) With which statements do you disagree

- a) If two objects repel, same charge
- b) ~~B~~ If two attract, both opposite charge
- c) If two ~~obj~~ attract, one charged + other neutral
- d) None of them

3) Which explanation agrees w/ contemporary model of electric charge

- a) negative charge lost positive charges
- b) positive charge lost negative charges
- c) positive charge ~~lost~~ ^{acquire} positive charges
- d) negative charge ~~lost~~ ^{acquire} negative charges
- e) a + c
- f) b + d

4) When an object gets charged by rubbing where does electric charge originate?

a) It comes from air

b) It is created by rubbing energy

(i) (c) It's the redistribution of charge not creation

- Concept

23) You have a foam rod rubbed w/ felt & small aluminum foil ball attached to a thread

A) What happens when slowly approach & then touch

(i) • The aluminum ball is attached to foam rod

B) Explain why

• The foam rubbed w/ felt becomes negative. When brought near the ball polarizes so negatives further away

p 524 - Problems

1) defibrillator sends jolt $- .20C \left(\frac{1e}{1.60 \times 10^{-19}e} \right)$

(1)

$$1.3 \times 10^{18}e$$

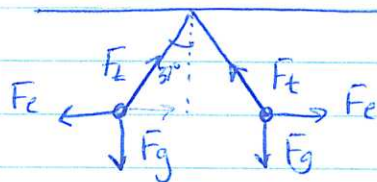
2) • balloons rubbed w/ sweater
• balloons hang from string

$$m = 4.0 \text{ mg} = 4.0 \times 10^{-3} \text{ kg}$$

$$l = .50 \text{ m}$$

$$\theta = 37^\circ$$

a) FBD

b) $F_e = ?$

$$\sum F_x = 0 \text{ N}$$

$$T_x - F_e = 0 \text{ N}$$

$$T \sin \theta = F_e$$

$$\sum F_y = 0 \text{ N}$$

$$T_y - F_g = 0 \text{ N}$$

$$T \cos \theta = mg$$

$$T = \frac{mg}{\cos \theta}$$

$$F_e = mg \tan \theta$$

$$= (4.0 \times 10^{-3} \text{ kg})(9.81 \text{ m/s}^2) \tan 37^\circ$$

(2)

$$F_e = .0296 \text{ N} \approx .030 \text{ N}$$

c) $F_t = ?$ $T = \frac{mg}{\cos \theta} = \frac{(4.0 \times 10^{-3} \text{ kg})(9.81 \text{ m/s}^2)}{\cos 37^\circ} = .049 \text{ N}$

d) F balloon exert on each other?

N3L - equal + opposite

e) Will ratio \rightarrow F change if one balloon more charged?Changing magnitude of one q doesn't change ratio

①

$$6) \begin{aligned} q_1 &= .0020 \text{ C} \\ q_2 &= .0060 \text{ C} \end{aligned}$$

Compare the F they exert on each other

(1)

• The forces they exert are equal

$$7) \begin{aligned} &\text{Two protons in nucleus} \\ r &= 2.0 \times 10^{-15} \text{ m} \\ q &= 1.60 \times 10^{-19} \text{ C} \end{aligned}$$

(1)

$$F_e = \frac{kqq}{r^2} = \frac{8.99 \times 10^9 \frac{\text{Nm}^2}{\text{C}^2} (1.60 \times 10^{-19} \text{ C})^2}{(2.0 \times 10^{-15} \text{ m})^2}$$

$$F_e = 57.5 \text{ N} = 58 \text{ N}$$