

Exam 1 Practice Test Answers

1. a
2. b (the ground is a reservoir of electrons that are attracted by the wand)
3. +3 (charge conservation)
4. 0 (polarization merely separates charges)
5. $2.25 \times 10^9 \text{ N}$ (1/4 as large)
6. 0 (Superposition. E fields of charges point in opposite directions, but have same magnitude at midpoint)
7. 11 N/C ($E = F/q$)
8. negative
9. dipole
10. $4 \times 10^{-9} \text{ C}$ (Gauss' Law)
11. 66 Joules (Volt = J/C, potential x charge = potential energy)
12. $1.8 \times 10^{10} \text{ Volts}$ (potential = kQ/r)
13. equipotential surface
14. 24 Coulombs ($CV = Q$)
15. 10^{-2} meters
16. $1/6 \text{ F}$
17. 90 F
18. 576 J ($CV^2/2$)
19. $4.43 \times 10^{-10} \text{ J/m}^3$ ($\epsilon_0 E^2/2$)
20. 6 N/C ($E = E_0/K$)