



[Visit Suncam.com for more courses](http://Suncam.com)

Continuing Education Course #614
Electromagnetic Theory
Electric & Magnetic Theory & Application - Course 1

1. Electric effects emanate from _____ charges.

- a. dipole
- b. isolated
- c. magnetic
- d. static

2. Magnetic effects emanate from _____ charges.

- a. bar magnet
- b. isolated poles
- c. moving
- d. relative motion

3. The charge of one electron is called an electrostatic unit (esu).

How many esu's are in a Coulomb?

- a. 2.64×10^{18}
- b. 6.24×10^{18}
- c. depends on the amperage
- d. depends on the medium

4. What is the ratio of the rest mass of a proton compared to the rest mass of the electron?

- a. 0.0005
- b. 0.1836
- c. 1836
- d. 1863

5. When every energy level in the conduction band in a solid is full, the material is called a/an _____,

- a. conductor
- b. dielectric
- c. maximum conductor
- d. saturated solid

6. What is the approximate lower range for a conductor?

- a. $1 \times 10^{-18} \text{ S} \cdot \text{m}$
- b. $1 \times 10^{-4} \text{ S} \cdot \text{m}$
- c. $1 \times 10^3 \text{ S} \cdot \text{m}$
- d. $6 \times 10^3 \text{ S} \cdot \text{m}$

7. What common conductor has the lowest resistance?

- a. copper
- b. aluminum
- c. steel
- d. iron

8. What type of force moves charge perpendicular to their original motion?

- a. electric
- b. electroweak
- c. gravity
- d. magnetic

9. What type of magnetism produces strongly magnetic material?

- a. antiferromagnetism
- b. diamagnetism
- c. ferromagnetism
- d. paramagnetism

10. The average distance between certain shells of electrons is approximately 1×10^{-12} m. What is the force of gravity between these electrons at such a short distance?

- a. 5.53×10^{-47} N
- b. 6.078×10^{-41} N
- c. 6.078×10^{-31} N
- d. 66.7 N

11. What is the magnitude of the electric force between a proton and electron 46×10^{-12} m apart in free space?

- a. 5.018×10^{-18} N
- b. 9.651×10^{-19} N
- c. 5.018×10^{-18} N
- d. 1.090×10^{-7} N

12. What is the magnitude of the electric field intensity for a parallel plate capacitor with a potential of 12 V applied and a distance of 0.3 cm between plates?

- a. 0.12 V/m
- b. 0.40 V/m
- c. 40 V/m
- d. 4000 V/m

13. During design discussions, a material with a relative permittivity of 5 is picked as the dielectric for certain capacitors. What is the expected permittivity?

- a. $1.8 \times 10^{-12} \text{C}^2/\text{N} \cdot \text{m}^2$
- b. $8.8 \times 10^{-12} \text{C}^2/\text{N} \cdot \text{m}^2$
- c. $4.4 \times 10^{-11} \text{C}^2/\text{N} \cdot \text{m}^2$
- d. $8.8 \times 10^{-8} \text{C}^2/\text{N} \cdot \text{m}^2$

14. What is a possible relative permittivity for glass?

- a. 2.9
- b. 5.0

- c. 56.2
- d. 80.37

15. A certain capacitor is constructed of two square parallel plates with air as the dielectric. If a mica insert with a permittivity of 4 is used in place of the air, by what factor does the capacitance increase?

- a. 4.0
- b. 4.5
- c. 5.0
- d. 8.0

16. Electric flux, Ψ , lines flow _____ from a positive charge and is numerically equal to the _____ in units of _____.

- a. inward / charge / coulomb
- b. inward / current / amperes
- c. outward / charge / coulomb
- d. outward / current / coulomb

17. What is the magnitude of the electric flux density 0.5 m from a wire with a uniform line charge of $30 \times 10^{-15} \text{ C/m}$?

- a. $9.5 \times 10^{-5} \text{ C/m}^2$
- b. $1.9 \times 10^{-4} \text{ C/m}^2$
- c. $6.0 \times 10^{-4} \text{ C/m}^2$
- d. $1.7 \times 10^{-3} \text{ C/m}^2$

18. A large 2 F capacitor is used in a car audio system. The supplying battery is regulated at 12V.

What is the charge on the capacitor at full charge?

- a. 2 C
- b. 6 C
- c. 12 C
- d. 24 C

19. Capacitors in parallel add like resistors in _____.

- a. inductors
- b. inverse series
- c. parallel
- d. series

20. What is the maximum energy in the field of a 2 F capacitor carrying 24 C when charged with 12 V?

- a. 2 J
- b. 6 J
- c. 24 J
- d. 144 J

[Purchase this course on Suncam.com](http://Suncam.com)