Class 12 Physics MCQ – Electric Charges and Fields Part 1

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Electric charge

1. Gold-leaf electroscope can be used _____
   a) Only to detect the presence of charge
   b) To detect the presence of charge as well as its nature (positive or negative)
   c) To measure the surface charge density
   d) To measure current

2. Why is gold used in the Gold-leaf electroscope?
   a) Gold is easily available in nature
   b) Gold is malleable
   c) Gold is conducting in nature
   d) Gold is cheap

3. Number of electrons in 1 Coulomb charge is _____
   a) $6.25*10^{21}$
   b) $6.25*10^{20}$
   c) $6.25*10^{25}$
   d) $6.25*10^{23}$

4. Two equally charged spheres attract each other. Now if they touch each other then they will _____
   a) Attract each other with the same amount of force
   b) Repel each other
   c) Attract each other with less amount of force
   d) Don't attract or repel

Conductors and Insulators

5. Current carrier in conductors is ____
   a) Electron
   b) Proton
   c) Neutron
   d) Positron

6. The rubber used in the wheels of aero-plane is _____
   a) Perfect insulator

b) Slightly conducting
c) Can be an insulator or conducting
d) Semiconductor

Charging by Induction

7. Induction occurs due to _____
   a) Movement of electron
   b) Leakage of charge
   c) Ionization of atoms
   d) Uniform charge distribution

8. If a positively charged sphere is taken close to another uncharged sphere then which of the following statements is true?
   a) Induction and attraction occur simultaneously
   b) Induction occurs before the attraction
   c) Attraction occurs before induction
   d) Attraction or repulsion may occur

Basic Properties of Electric Charge

9. A charged conductor has its charge only on its outer surface. This statement is true for which of the following?
   a) For all conductors
   b) Only for spherical conductors
   c) For hollow conductors
   d) For those conductors which don’t have sharp edges

10. Which one of the following is a safe place during lightning?
    a) Under a tree
    b) Under a light post
    c) House with lightning arrester
    d) High wall

11. Earth is the source of _____
    a) An infinite positive and negative charge
    b) Positive charge
    c) Negative charge
    d) Zero charge

12. Which one is not the property of charge?
    a) Charge is additive
    b) Charge is conserved

c) Quantization of charge
d) A charge is self-destructive

Coulomb's Law

13. Coulomb's Law is valid for _____
    a) Only point charge
    b) For both point charge and distributed charge
    c) Only distributed charges
    d) Neither distributed nor point charge

14. Which one of the following is similar between electrostatic force and gravitational force?
    a) Force can be attractive or repulsive
    b) The force depends on the medium between the bodies
    c) Both the forces are strong forces
    d) Force is inversely proportional to the distance between the bodies

15. Two 1 Coulomb charges are kept at 1m distance in air medium. Force of attraction or repulsion between them will be _____
    a) $9*10^9$ N
    b) 1 dyne
    c) 1 N
    d) $3*10^3$ N

16. Let B be the midpoint of AC. Two point charges Q are placed at A and C. What should be the value of charge placed at B so that the system remains at equilibrium?
    a) –Q/2
    b) –Q/4
    c) +Q/2
    d) +Q/4

17. What is the C.G.S. unit of charge?
    a) Stat Coulomb
    b) Coulomb
    c) EMU
    d) Pascal

18. The dimension of ε_0 _____
    a) $[M^{-1}L^{-3}T^4I^2]$
    b) $[M^{-1}L^{-3}T^4I^4]$
    c) $[M^{-1}L^{-3}T^2I^2]$
    d) $[M^1L^{-3}T^4I^2]$

19. What will be permittivity of a medium which has dielectric constant 5.4?
    a) $4.78*10^{-11}$ $C^2N^{-1}m^{-2}$

b) $8.85*10^{-10} C^2 N^{-1} m^{-2}$
c) $4.5*10^{-10} C^2 N^{-1} m^{-2}$
d) $3.2*10^{-11} C^2 N^{-1} m^{-2}$

Forces Between Multiple Charges

20. A 1C charge is placed at the origin. Other infinite numbers of unit charges are placed at √2, √4, √8, √16,….(up to infinite) distances from the origin in a straight line. What will be the total force acting on the 1st charge?
    a) $9*10^9$ N
    b) $18*10^9$ N
    c) Infinite
    d) 1 N

21. Which among the following is false?
    a) Coulomb force is a central force
    b) The force between two charges depend on the medium between them
    c) Coulomb force is a weak force
    d) The net force on a charge is the vector sum of the forces acting on it due to several other charges