

## VERY SHORT ANSWER QUESTIONS

1. What is the least possible value of charge?
2. How many of electrons are present in 1 coulomb of charge?
3. What do you mean by quantization of charge?
4. Can a body have a charge of  $0.8 \times 10^{-19}C$ ?
5. Is the mass of a body affected on charging?
6. Name the experiment which established the quantum nature of electric charge.
7. Give two properties of electric charge.
8. Give two differences between electric charge and mass.
9. What is the cause of charge on a body?
10. How is the mass of a body affected on charging?
11. Can you remove protons from a body to charge it?
12. A positively charged rod repels a suspended object. Can you conclude that the object is positively charged?
13. A positively charged rod attracts a suspended object. Can you conclude that the object is negatively charged?
14. Why do the gramophone records get covered with dust easily?
15. When are charged bodies approximately point charges?
16. If  $q_1q_2 > 0$ , what is the nature of force between the two charges?
17. If  $q_1q_2 < 0$ , what is the nature of force between the two charges?
18. What are the limitations of coulomb's law of electric force?
19. Write the dimensional formula of  $\epsilon$ .
20. How does the force between two point charges change if the dielectric constant of the medium in which they are kept increases?
21. The relative permittivity of mica is 6. What is its absolute permittivity?
22. Can a relative permittivity of a medium be less than 1?
23. What will be the charge on a  ${}^4_7N$  nucleus?
24. An inflated balloon is charged by rubbing with fur. Will it stick readily to a conducting wall or to an insulating wall? Give reason.

## SHORT QUESTIONS

1. Is coulomb a big or small unit of charge?
2. When you run comb through dry hair, it attracts bits of paper. Why? What would you expect if the hair is wet or if it is a rainy day?
3. Two point charges of  $+2\mu C$  and  $+6\mu C$  repel each other with a force of 12N. If each is given an additional charge of  $-4\mu C$ , what will be the new force?
4. Dielectric constant of water is 80. What is its permittivity?
5. Three charges each of  $+1\mu C$  are placed at the corners of an equilateral triangle. If the force between any two charges be  $F$ , what will be the net force on each charge?
6. Force of attraction between two point charges at a distance  $d$  is  $F$ . What distance apart should they be kept in the same medium so that force between them is  $F/3$ ?
7. Two point charges placed at a distance  $r$  in air exert a force on each other. Find the distance  $r_0$  at which these charges will exert the same force in a medium of dielectric constant  $K$ .
8. Given that  $q_1 + q_2 = q$ . For what ratio of  $\frac{q_1}{q}$  will the force between  $q_1$  and  $q_2$  be maximum?

9. The mass of a proton is 1836 times that of an electron. The force of repulsion between two protons at a certain distance is  $F$ . What will be the force between two electrons separated by the same distance?
10. How much is the electrostatic force stronger than the gravitational force?
11. Distinguish between electric charge and mass.

### **CONCEPTUAL QUESTIONS**

1. What similarities do electrostatic forces have to gravitational forces?
2. What are the most significant differences between electrostatic forces and gravitational forces?
3. Repulsion is the sure test for electrification. Explain.
4. Electrostatic experiments cannot be conducted successfully on humid days. Explain.
5. Two similarly charged pith ball are suspended from a point. The balls repel each other. If a mica sheet is introduced between them, what will be the effect on the position of balls?
6. Can we charge a body to have a charge of  $15e/2$ ?
7. Any conducting object connected to earth is said to be grounded. Explain.
8. How will you give permanent positive charge to a conductor by induction?
9. You cannot disturb the electrical neutrality of ordinary matter very much. Explain.
10. The leaves of an electroscope always diverge when we bring a charged body near it, without touching it. Why?
11. A gold leaf electroscope is charged negatively. If an unknown charge  $X$  is brought near its cap, the divergence of the leaves increases. Is the unknown charge positive or negative?
12. Can two balls having the same kind of charge attract each other?
13. Although ordinary rubber is insulator, the rubber tyres of air craft are made slightly conducting. Why?
14. Give two examples which illustrate that the electrical forces are enormously stronger than the gravitational forces.
15. A force  $F$  is acting between two charges placed some distance apart in vacuum. If a brass rod is placed between these two charges, how does the force change?