

GIRLS' HIGH SCHOOL AND COLLEGE

2020 - 2021

CLASS -12 A & B

PHYSICS

WORKSHEET-01

Chapter - ELECTRIC CHARGES & FIELDS

Topic - CHARGES : COULUMB'S LAW

INSTRUCTION : Parents kindly instruct your ward to visit the relevant websites (en.m.wikipedia.org, www.khanacademy.org, www.physicsclassroom.com , ncertbooks.prashanthellina.com) or refer nootan ISC 12 Physics by Kumar& Mittal (Nageen Prakashan) or Physics-12 by D.K.Tyagi (BalajPublications) to answer the following questions on the topics - Charge, Coulumb's Law, it's Vector Form, Principle of Superposition, Dielectric Constant, Numericals based on Coulumb's Law. The students should go through the topics first for at least 2 to 3 days and then attempt the questions.

- Q 1) What is coulumb? How many coulombs does an electron have?
- Q 2) State and explain the three important properties of electric charge?
- Q 3) Is it possible for a body to have 2.1×10^{-19} C of charge? Explain.
- Q 4) How many electrons are contained in 1C of charge?
- Q 5) Which has more number of electrons- K^{+1} or Cl^{-1} ?
- Q 6) State coulumb's law?
- Q 7) Give the mathematical expression for Coulumb's Law and hence state what is permittivity? Give its unit and dimensional formula?
- Q 8) Two charges $q_1 = +48$ micro C and $q_2 = -54$ micro C are kept 0.6 mm apart. Find the force acting between them. Give its nature.
- Q 9) Two charges q ($= 5 \times 10^{-19}$ C) and $4q$ are kept at a separation of 2.2 m apart. Where should a third charge Q be kept such that it experiences equilibrium (no force)? What should be the nature of Q ?
- Q 10) Give Coulumb's Law in VECTOR FORM along with a proper figure to explain the directions.
- Q 11) Explain how Superposition Principle is applicable for force on a charge due to a system of charges in its vicinity.
- Q 12) The force of attraction between two point charges 'r' apart is 'F'. Under what condition will this force double itself keeping the magnitude of the charges same?
- Q 13) What is dielectric constant? Give its mathematical expression in terms of electrostatic force in medium and in free space.
- Q 14) Define relative permittivity. How is it related to dielectric constant?
- Q 15) The force between two charges kept in free space is 'F'. What is new force between them if they are now kept in a medium with dielectric constant 'K' with double the distance between them?