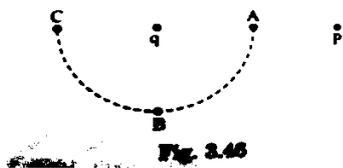


Class X (Physics)
Sheet 1 (Electricity)

1. A polythene piece rubbed with wool is found to have a negative charge of $3.2 \times 10^{-7} \text{C}$ (i) Estimate the number of electrons transferred. (ii) Is there a transfer of mass from wool to polythene?
2. A pith ball A of mass $9 \times 10^{-5} \text{kg}$ carries a charge of $5 \mu\text{C}$. What must be the magnitude and sign of the charge on a pith ball B held 2cm directly above the ball A, such that the ball A remains stationary?
3. Two charged spheres A & B each having charge $6.5 \times 10^{-7} \text{C}$ & their centers separated by 50cm. Suppose the sphere A and B have identical size. A third sphere of the same size but uncharged is brought in contact with the first, then brought in contact with second, and finally removed from both. What is the new force of repulsion between A & B?
4. What is the nature of force for $q_1 q_2 > 0$ & $q_1 q_2 < 0$, explain.
5. Force of attraction between two point charges placed at a distance d is F . what distance apart should they be kept in the same medium so that the force between them is $F/3$.
6. If 100Joule of work must be done to move electric charge of 4C from a place where potential is -10 volt to another place where potential is V volt, find the value of V .
7. Consider the situation of fig. the work done in taking a point charge from P to A is W_A , from P to B is W_B and from P to C is W_C , what is the relation between W_A , W_B & W_C .



8. Two point charges repel each other with a force F when placed in water of dielectric constant 81. What will be the force between them when placed at the same distance apart in air?
9. If a body contains n_1 electrons and n_2 protons then what is the total charge on the body?
10. What is the total positive or negative charge present in 1 molecule of water?
11. A point charge Q is placed at point O shown in fig. is the potential difference $V_A - V_B$ positive, negative or zero,

if Q is (i) positive (ii) negative charge.



12. An electron and proton are released from rest in a uniform electric field. Which of them will have larger acceleration?
13. If an electron is acceleration by a potential difference of 1 volt, calculate the gain in energy in joule and electron volt.
14. If q is the positive charge on each molecule of water, what is the total positive Charge in (360g) a mug of water?
15. Two point charges $4e$ and e each, at a separation r in air, exert force of magnitude F . They are immersed in a medium of dielectric constant 16. What should be the separation between the charges so that the force between them remains unchanged?