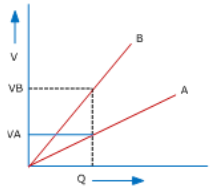
SCHOLUP

Class XII – Physics (Electric Charges and Fields)

1. Show does the force between two point charges change if the dielectric constant of the medium in which they are kept increases?
2. A charged rod P attracts rod R whereas P repels another charged rod Q. What type of force is developed between Q an R?
3. A free proton and a free electron are placed in a uniform field. Which of the two experience greater force and greater acceleration?
4. No two electric lines of force can intersect each other? Why?
5. A particle of mass m and charge q is released from rest in a uniform electric field of intensity E. Calculate the kinetic energy it attains after moving a distance s between the plates?
6. Two pint charges +q and +9q are separated by a distance of 10a. Find the point on the line joining the two charges where electric field is zero?
7. I) The electric field $\bar{E}$ due to a point change at any point near to tit is defined as: $\bar{E} = \lim_{q\to 0} \frac{\bar{F}}{q}$ where q is the test charge and $\bar{F}$ is the force acting on it. What is the significance of $\lim_{q\to 0}$ in this expression?
   II) Two charges each 2 * 10^{-7} C but opposite in sign form a system. These charges are located at points A (0, 0,-10) cm and B (0, 0, 10) cm respectively. What is the total charge and electric dipole moment of the system?
8. A) Sketch electric lines of force due to (i) isolated positive charge (i.e. q>0) and (ii) isolated negative charge (i.e. q<0).
   B) Two pint charges q and –q are placed at a distance 2a apart. Calculate the electric field at a pint P situated at a distance r along the perpendicular bisector of the line joining the charges. What is the field when r >>a?
9. The graph shows the variation of voltage V across the plates of two capacitors A and B versus increase of charge Q stored on them. Which of two capacitors have higher capacitance? Give reason for your answer?



10. A sphere of radius r_1 encloses a charge Q. If there is another concentric sphere S_2 of radius r_2 ($r_2 > r_1$) and there is no additional charge between S_1 and S_2. Find the ratio of electric flux through S_1 and S_2?