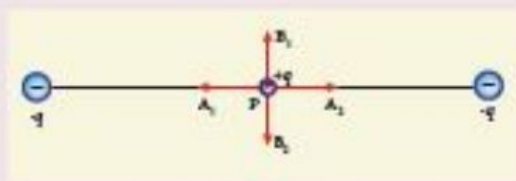
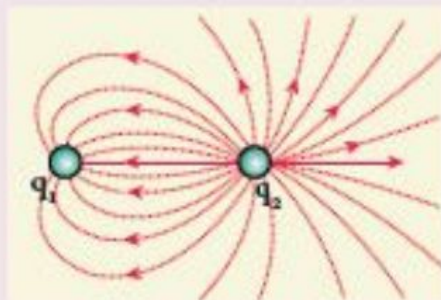


## I Multiple choice questions

1. Two identical point charges of magnitude  $-q$  are fixed as shown in the figure below. A third charge  $+q$  is placed midway between the two charges at the point P. Suppose this charge  $+q$  is displaced a small distance from the point P in the directions indicated by the arrows, in which direction(s) will  $+q$  be stable with respect to the displacement?

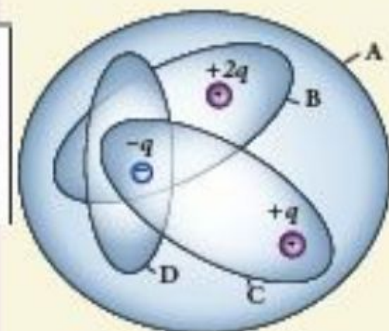


- (a)  $A_1$  and  $A_2$  (b)  $B_1$  and  $B_2$   
 (c) both directions (d) No stable
2. Which charge configuration produces a uniform electric field?
- (a) point charge  
 (b) uniformly charged infinite line  
 (c) uniformly charged infinite plane  
 (d) uniformly charged spherical shell
3. What is the ratio of the charges  $\left| \frac{q_1}{q_2} \right|$  for the following electric field line pattern?



- (a)  $\frac{1}{5}$  (b)  $\frac{25}{11}$   
 (c) 5 (d)  $\frac{11}{25}$

4. An electric dipole is placed at an alignment angle of  $30^\circ$  with an electric field of  $2 \times 10^5 \text{ N C}^{-1}$ . It experiences a torque equal to  $8 \text{ N m}$ . The charge on the dipole if the dipole length is  $1 \text{ cm}$  is
- (a)  $4 \text{ mC}$  (b)  $8 \text{ mC}$   
 (c)  $5 \text{ mC}$  (d)  $7 \text{ mC}$
5. Four Gaussian surfaces are given below with charges inside each Gaussian surface. Rank the electric flux through each Gaussian surface in increasing order.



- (a)  $D < C < B < A$   
 (b)  $A < B = C < D$   
 (c)  $C < A = B < D$   
 (d)  $D > C > B > A$
6. The total electric flux for the following closed surface which is kept inside water