1. (c) We put a unit positive charge at *O*. Resultant force due to the charge placed at *A* and *C* is zero and resultant charge due to *B* and *D* is towards *D* along the diagonal *BD*.
2. (c) All other charges are its integral multiple.
3. (a) The force between 4*q* and *q*; 

The force between *Q* and *q*; 

We want  or  ⇒ 

1. (a) The charge given to a sphere will be distributed uniformly over the surface.
2. (a) The position of the balls in the satellite will become as shown below

*+Q*

*L*

*L*

*+Q*

180o

Thus angle *θ* = 180° and Force 

1. (a) 
2. (d) Resultant charges after adding the – 2*C* be  and  ⇒ *F*
3. (c) Because in case of metallic sphere either solid or hollow, the charge will reside on the surface of the sphere. Since both spheres have same surface area, so they can hold equal maximum charge.
4. (b)  and ⇒ 
5. (c) Net force on *B* 

*A*

*FC*

*FA*

3 *cm*

4 *cm*

+15 *esu*

– 20 *esu*

+12 *esu*

*B*

*C*



, 

⇒ 

1. (d) In the presence of medium force becomes .
2. (a) Separation between the spheres is not too large as compared to their radius so due to induction effect redistribution of charge takes place. Hence effective charge separation decreases so force increases.
3. (a) ⇒ 

Electrons are removed, so chare will be positive.

1. (a) When put 1 *cm* apart in air, the force between *Na* and *Cl* ions = *F*. When put in water, the force between *Na* and *Cl* ions 
2. (c)
3. (c) Initially, force between *A* and *C* 

*r*

*A*

*C*

– *Q*

+*Q*

B

*r*/2

*r*/2

+*Q*

*FA*

*FC*

When a similar sphere *B* having charge +*Q* iskept at the mid point of line joining *A* and *C*, then Net force on *B* is .

(Direction is shown in figure)

1. (a) 

If *F* is the force in air, then  is less than *F* since .

1. (b) ⇒
2. (a)  *i.e.* 
3. (a) In second case, charges will be  and 

Since  *i.e.* 

∴  ⇒ (Attractive)

1. (b) By using  .
2. (b) *FA* = force on *C* due to charge placed at *A*



*FB* = force on *C* due to charge placed at *B*



*+*1*μC*

*–* 1*μC*

*+*2*μC*

10 *cm*

*FB*

*B*

*A*

*C*

*FA*

120o

Net force on *C*



1. (c) By using 
2. (b)  ⇒ 
3. (c) By using 

⇒ 

1. (c) Number of atoms in given mass 

*+*

*–*

*A*

*B*

10 *cm*

*e–*

= 9.48 × 1022

Transfer of electron between balls 

= 9.48 × 1016

Hence magnitude of charge gained by each ball.

*Q* = 9.48 × 1016 × 1.6 × 10–19 = 0.015 *C*

Force of attraction between the balls 

1. (a) Surface charge density (*σ*) 

– *Q* + 2*Q* = *Q*

*–* 2*Q*

*+*2*Q*

*b*

*c*

*a*

So  and 

1. (a) In the following figure since  and they are equally inclined with each other, so their resultant will be zero.

*q*

*A*

*B*

*C*

*q*

*q*

*FA*

*Q*

*FC*

*FB*

1. (d) By using 
2. (c) 

60o

*A*

*+Q*

*FB*

*FC*

*– Q*

*C*

*B*

*a*

*FC* sin60o

*FB* sin60o

60o

60o

*FC* cos60o

*FB* cos60o

60o

60o

Hence force experienced by the charge at *A* in the direction normal to *BC* is zero.