1. (b) Suppose in the following figure, equilibrium of charge *B* is considered. Hence for it's equilibrium 

⇒  ⇒ 

*QA* = *Q*

*q*

*x*

*x*1

*x*2

*FC*

*F*A

*A*

*B*

*C*

*QB* = *Q*

**Short Trick :** For such type of problem the magnitude of middle charge can be determined if either of the extreme charge is in equilibrium by using the following formula.

If charge *A* is in equilibrium then *q* = – 

If charge *B* is in equilibrium then 

If the whole system is in equilibrium then use either of the above formula.

1. (a) Inside the hollow sphere, at any point the potential is constant.
2. (d) The force is perpendicular to the displacement.
3. (c) A movable charge produces electric field and magnetic field both.
4. (b) Because current flows from higher potential to lower potential.
5. (a) All charge resides on the outer surface so that according to Gauss law, electric field inside a shell is zero.
6. (a) The electric potential 

Now 

Now  and 

Hence , so at point (1*m*, 0, 2*m*)

 or 8 along negative *X*-axis.

1. (b) Since potential inside the hollow sphere is same as that on the surface.
2. (d) On the equipotential surface, electric field is normal to the charged surface (where potential exists) so that no work will be done.
3. (c) Electric lines force due to negative charge are radially inward.

–

1. (b)  ⇒ 
2. (a) In non-uniform electric field. Intensity is more, where the lines are more denser.
3. (c)

*EC* =*E*

*EB* =*E*

*EA* = *E*

120o

120o

120o

⇒

*EA* = *E*

*EBC* = *E*

*EC*

*EB*

*EA*

*Enet* = 0

⇒

1. (c) ABCDE is an equipotential surface, on equipotential surface no work is done in shifting a charge from one place to another.
2. (b) According to the question,  ⇒ 
3. (d) May be at positive, zero or negative potential, it is according to the way one defines the zero potential.
4. (c)  ⇒ 
5. (b) 

∴ 

*q* should be less than 2.0833 × 10–3. In the given set of options 2 × 10–3 is the maximum charge which is smaller than 2.0833 × 10–3.

1. (a) Suppose electric field is zero at point *N* in the figure then

*E*2

*E*1

*N*

*x*1

*x*2

*Q*1 = 25*μC*

*Q*2 = 36*μC*

*x* = 11 *cm*

At *N* |*E*1| = |*E*2|

which gives 

1. (d) Total charge . By using the formula . New charge on sphere *A* is . Initially it was  *i.e.,*  charge flows from *A* to *B*.
2. (b) Because *E* points along the tangent to the lines of force. If initial velocity is zero, then due to the force, it always moves in the direction of *E*. Hence will always move on some lines of force.
3. (b) Electrostatic energy density 

∴ 

1. (a)

100 *cm*

*q*0

10*μC*

*A*

*B*

100 *cm*

Since  so 

1. (c) For equilibrium of *q*

|*F*1| = |*F*2|

*F*2

*F*1

*q*

*x*1

*x*2

*Q*1 = + 4*e*

*Q*2 = +*e*

*x*

Which gives 

1. (c) Electric lines of force never intersect the conductor. They are perpendicular and slightly curved near the surface of conductor.
2. (a) Since *qE* = *mg* or 

= 10.0 × 10–8 = 1 × 10–7 *V/m*

1. (c) Since charge *Q* moving on equipotential surface so work done is zero.
2. (b) The field produced by charge – 3*Q* at *A*, this is *E* as mentioned in the Example.

 (along *AB* directed towards negative charge)

*A*

*B*

*x*

*Q*

– 3 *Q*

Now field at location of – 3*Q* *i.e*. field at *B* due to charge *Q* will be  (along *AB* directed away from positive charge)

1. (c)  ⇒ 

⇒ = 2.5 × 105 *N/C*.

1. (b) 
2. (b) For balance  ⇒ 

Also 

⇒ = 260 *N/C*

1. (a) Electric field inside a conductor is zero.
2. (c) For pair of charge 







1. (c) Electric field near the conductor surface is given by  and it is perpendicular to surface.
2. (d) 

60°

*d*

2*m*

*E*

→

*X*

⇒ 4 = 0.2 × *E* × (2 cos 60o)

= 0.2 *E* × (2 × 0.5)

∴ 

1. (c) Potential at centre *O* of the square



*Q*

*Q*

*Q*

*Q*



*a*

*O*

Work done in shifting (– *Q*) charge from centre to infinity 

1. (b) Using  ⇒ ⇒ 
2. (c) Due to deutron, intensity of electric field at 1 Å distance,



1. (c) Lines of force is perpendicular to the equipotential surface. Hence angle = 90o
2. (b)
3. (d)
4. (a)  ⇒ 