1. Three equal charges are placed on the three corners of a square. If the force between  and is  and that between and  is , the ratio of magnitudes  is

(a)  (b) 2

(c)  (d) 

1.  is a right angled triangle in which  and . And ∠ *ABC* = *π*/2. The three charges  and  are placed respectively on ,  and . The force acting on  is

(a)  (b) 

(c)  (d) Zero

1. With the rise in temperature, the dielectric constant of a liquid

(a) Increases (b) Decreases

(c) Remains unchanged (d) Charges erratically

1. Two charges and are placed in vacuum at a distance  and the force acting between them is . If a medium of dielectric constant 4 is introduced around them, the force now will be

(a)  (b) 

(c)  (d) 

1. Force of attraction between two point charges  and – *Q* separated by  is . When these charges are placed on two identical spheres of radius  whose centres are apart, the force of attraction between them is

(a) Greater than  (b) Equal to 

(c) Less than  (d) Less than 

1. When  electrons are removed from a neutral metal sphere, the charge on the sphere becomes

(a)  (b) 

(c)  (d) 

1. A force  acts between sodium and chlorine ions of salt (sodium chloride) when put  apart in air. The permittivity of air and dielectric constant of water are  and  respectively. When a piece of salt is put in water electrical force acting between sodium and chlorine ions  apart is

(a)  (b) 

(c)  (d) 

1. A conductor has  positive charge. The conductor has

(Charge on electron )

(a) 9 electrons in excess (b) 27 electrons in short

(c) 27 electrons in excess (d) 9 electrons in short

1. There are two charges +1 microcoulombs and +5 microcoulombs. The ratio of the forces acting on them will be

(a) 1 : 5 (b) 1 : 1

(c) 5 : 1 (d) 1 : 25

1. The value of electric permittivity of free space is

(a)  (b) 

(c)  (d) 

1. Two similar spheres having  and  charge are kept at a certain distance.  force acts between the two. If in the middle of two spheres, another similar sphere having  charge is kept, then it experience a force in magnitude and direction as

(a) Zero having no direction

(b)  towards  charge

(c)  towards  charge

(d)  towards  charge

1. A charge  is divided into two parts of  and . If the coulomb repulsion between them when they are separated is to be maximum, the ratio of  should be

(a) 2 (b) 

(c) 4 (d) 

1. Number of electrons in one coulomb of charge will be

(a)  (b) 

(c)  (d) 

1. When air is replaced by a dielectric medium of constant , the maximum force of attraction between two charges separated by a distance

(a) Decreases  times (b) Remains unchanged

(c) Increases  times (d) Increases  times

1. A glass rod rubbed with silk is used to charge a gold leaf electroscope and the leaves are observed to diverge. The electroscope thus charged is exposed to *X-*rays for a short period. Then

(a) The divergence of leaves will not be affected

(b) The leaves will diverge further

(c) The leaves will collapse

(d) The leaves will melt

1. One metallic sphere  is given positive charge whereas another identical metallic sphere  of exactly same mass as of is given equal amount of negative charge. Then

(a) Mass of  and mass of  still remain equal

(b) Mass of  increases

(c) Mass of  decreases

(d) Mass of  increases

1. The force between two charges  apart is . If each charge is moved towards the other by , then the force between them will become

(a)  (b) 

(c)  (d) 

1. Two charged spheres separated at a distance *d* exert a force on each other. If they are immersed in a liquid of dielectric constant 2, then what is the force (if all conditions are same)

(a)  (b) 

(c)  (d) 

1. Two point charges  and  repel each other with a force of . If a charge of is added to each of them, then the force between them will become

(a)  (b) 

(c)  (d) 

1. Electric charges of  and  are placed in air at the corners *A, B* and *C* respectively of an equilateral triangle *ABC* having length of each side 10 *cm*. The resultant force on the charge at *C* is

(a) 0.9 *N* (b) 1.8 *N*

(c) 2.7 *N* (d) 3.6 *N*

1. Equal charges  are placed at the four corners  of a square of length . The magnitude of the force on the charge at *B* will be

(a)  (b) 

(c)  (d) 

1. Two spherical conductors *B* and *C* having equal radii and carrying equal charges in them repel each other with a force *F* when kept apart at some distance. A third spherical conductor having same radius as that of *B* but uncharged is brought in contact with *B*, then brought in contact with *C* and finally removed away from both. The new force of repulsion between *B* and *C* is

(a)  (b) 

(c)  (d) 

1. The ratio of electrostatic and gravitational forces acting between electron and proton separated by a distance  will be (Charge on electron = 1.6 × 10–19 *C*, mass of electron = 9.1 × 10–31 *kg*, mass of proton =  

(a) 2.36 × 1039 (b) 2.36 × 1040

(c) 2.34 × 1041 (d) 2.34 × 1042

1. Two point charges 3 × 10–6 *C* and 8 × 10–6 *C* repel each other by a force of 6 × 10–3 *N*. If each of them is given an additional charge – 6 × 106 *C*, the force between them will be

(a) 2.4 × 10–3 *N* (attractive) (b) 2.4 × 10–9 *N* (attractive)

(c) 1.5 × 10–3 *N* (repulsive) (d) 1.5 × 10–3 *N* (attractive)

1. Two equally charged, identical metal spheres *A* and *B* repel each other with a force '*F*'. The spheres are kept fixed with a distance '*r*' between them. A third identical, but uncharged sphere *C* is brought in contact with *A* and then placed at the mid-point of the line joining *A* and *B*. The magnitude of the net electric force on *C* is

(a) *F* (b) 3*F*/4

(c) *F*/2 (d) *F*/4

1. Two charges of equal magnitudes and at a distance *r* exert a force *F* on each other. If the charges are halved and distance between them is doubled, then the new force acting on each charge is

(a) *F* / 8 (b) *F* / 4

(c) 4 *F* (d) *F* / 16

1. An infinite number of charges, each of charge 1 *μC*, are placed on the *x*-axis with co-ordinates *x* = 1, 2, 4, 8, ....∞. If a charge of 1 *C* is kept at the origin, then what is the net force acting on 1 *C* charge

(a) 9000 *N* (b) 12000 *N*

(c) 24000 *N* (d) 36000 *N*

1. A soap bubble is given a negative charge, then its radius

(a) Decreases

(b) Increases

(c) Remains unchanged

(d) Nothing can be predicted as information is insufficient

1. The number of electrons in 1.6 *C* charge will be

(a)  (b) 

(c)  (d) 1.1 × 102

1. Identify the wrong statement in the following. Coulomb's law correctly describes the electric force that

(a) Binds the electrons of an atom to its nucleus

(b) Binds the protons and neutrons in the nucleus of an atom

(c) Binds atoms together to form molecules

(d) Binds atoms and molecules together to form solids

1. Four charges are arranged at the corners of a square , as shown in the adjoining figure. The force on the charge kept at the centre *O* is

*O*

*C*

+*q*

*+*2*q*

*B*

*A*

*+q*

*D*

*–* 2*q*

(a) Zero (b) Along the diagonal 

(c) Along the diagonal  (d) Perpendicular to side 

1. A ball of mass 1 *g* and charge  moves from a point *A*. where potential is 600 *volt* to the point *B* where potential is zero. Velocity of the ball at the point *B* is 20 *cm*/*s*. The velocity of the ball at the point *A* will be

(a) 22.8 *cm*/*s* (b) 228 *cm*/*s*

(c) 16.8 *m*/*s* (d) 168 *m*/*s*

1. The acceleration of an electron in an electric field of magnitude 50 *V*/*cm*, if *e*/*m* value of the electron is *C*/*kg*, is

(a) *m*/*sec*2 (b)  *m*/*sec*2

(c)  *m*/*sec*2 (d) Zero

1. Three charges  and  are placed at the vertices of an equilateral triangle of side *l* as shown in the figure. If the net electrostatic energy of the system is zero, then *Q* is equal to

*Q*

*+q*

*l*

*l*

*+q*

*l*

(a) 

(b) 

(c) 

(d) Zero

1. A positively charged particle moving along *x*-axis with a certain velocity enters a uniform electric field directed along positive *y*-axis. Its

(a) Vertical velocity changes but horizontal velocity remains constant

(b) Horizontal velocity changes but vertical velocity remains constant

(c) Both vertical and horizontal velocities change

(d) Neither vertical nor horizontal velocity changes

1. Electric potential at any point is , then the magnitude of the electric field is

(a)  (b) 

(c)  (d) 7

1. The work done in bringing a 20 *coulomb* charge from point *A* to point *B* for distance 0.2*m* is 2*J*. The potential difference between the two points will be (in *volt*)

(a) 0.2 (b) 8

(c) 0.1 (d) 0.4

1. A hollow sphere of charge does not produce an electric field at any

(a) Point beyond 2 metres (b) Point beyond 10 metres

(c) Interior point (d) Outer point

1. If  energy is required to move a charge of 0.25 *coulomb* between two points. Then what will be the potential difference between them

(a) 178 *V* (b) 256 *V*

(c) 356 *V* (d) None of these

1. Kinetic energy of an electron accelerated in a potential difference of 100 *V* is

(a) *J* (b) *J*

(c) *J* (d) *J*

1. A drop of  water carries  charge. What electric field should be applied to balance its weight (assume 

(a) 10 *V*/*m* upward (b) 10 *V*/*m* downward

(c) 0.1 *V*/*m* downward (d) 0.1 *V*/*m* upward

1. A charged particle of mass 0.003 *gm* is held stationary in space by placing it in a downward direction of electric field of . Then the magnitude of the charge is

(a)  (b) 

(c)  (d) 

1. Two point charges  and  are at 16 *cm* away from each other. Where should another charge *q* be placed between them so that the system remains in equilibrium

(a) 24 *cm* from  (b) 12 *cm* from 

(c) 24 *cm* from  (d) 12 *cm* from 

1. If 3 charges are placed at the vertices of equilateral triangle of charge ‘*q*’ each. What is the net potential energy, if the side of equilateral  is *l cm*

(a)  (b) 

(c)  (d) 

1. The distance between charges  and  is 0.2 *m*. The distance at which a third charge should be placed in order that it will not experience any force along the line joining the two charges is

(a) 0.44 *m* (b) 0.65 *m*

(c) 0.556 *m* (d) 0.350 *m*

1. If identical charges  are placed at each corner of a cube of side *b*, then electric potential energy of charge  which is placed at centre of the cube will be

(a)  (b) 

(c)  (d) 

1. An electron having charge ‘*e*’ and mass ‘*m*’ is moving in a uniform electric field *E*. Its acceleration will be

(a)  (b) 

(c)  (d) 

1. A simple pendulum of period  has a metal bob which is negatively charged. If it is allowed to oscillate above a positively charged metal plate, its period will

(a) Remains equal to *T* (b) Less than 

(c) Greater than  (d) Infinite

1. A charged particle of mass  and charge  is released from rest in a uniform electric field  Neglecting the effect of gravity, the kinetic energy of the charged particle after ‘*t*’ second is

(a)  (b) 

(c)  (d) 

1. A proton is about 1840 times heavier than an electron. When it is accelerated by a potential difference of 1 *kV*, its kinetic energy will be

(a) 1840 *keV* (b) 1/1840 *keV*

(c) 1 *keV* (d) 920 *keV*

1. A conducting sphere of radius *cm* is given a charge . What is  at centre

(a)  (b) 

(c) Zero (d) 

1. A thin spherical conducting shell of radius  has a charge *q*. Another charge *Q* is placed at the centre of the shell. The electrostatic potential at a point *p* a distance  from the centre of the shell is

(a)  (b) 

(c)  (d) 

1. A hollow conducting sphere is placed in an electric field produced by a point charge placed at *P* as shown in figure. Let  be the potentials at points  and *C* respectively. Then

*C*

*P*

*A*

*B*

(a)  (b) 

(c)  (d) 

1. A point charge is kept at the centre of a metallic insulated spherical shell. Then

(a) Electric field out side the sphere is zero

(b) Electric field inside the sphere is zero

(c) Net induced charge on the sphere is zero

(d) Electric potential inside the sphere is zero

1. An electron moving with the speed  per sec is shooted parallel to the electric field of intensity . Field is responsible for the retardation of motion of electron. Now evaluate the distance travelled by the electron before coming to rest for an instant (mass of  charge 

(a) 7 *m* (b) 0.7 *mm*

(c) 7 *cm* (d) 0.7 *cm*

1. An electron enters in high potential region  from lower potential region  then its velocity

(a) Will increase

(b) Will change in direction but not in magnitude

(c) No change in direction of field

(d) No change in direction perpendicular to field

1. The electric potential at the surface of an atomic nucleus (*Z* = 50) of radius 9.0× *cm* is

(a) 80 *volts* (b) 8 × *volts*

(c) 9 *volts* (d) 9 × *volts*

1. A pellet carrying charge of 0.5 coulombs is accelerated through a potential of 2,000 *volts*. It attains a kinetic energy equal to

(a) 1000 *ergs* (b) 1000 *joules*

(c) 1000 *kWh* (d) 500 *ergs*

1. A particle has a mass 400 times than that of the electron and charge is double than that of a electron. It is accelerated by 5*V* of potential difference. Initially the particle was at rest, then its final kinetic energy will be

(a) 5 *eV* (b) 10 *eV*

(c) 100 *eV* (d) 2000 *eV*

1. An electron (charge =  *coulomb*) is accelerated through a potential of 1,00,000 *volts*. The energy required by the electron is

(a)  *joule* (b) 

(c) *joule* (d)  *joule*