# NEET : CHAPTER WISE TEST-1

**SUBJECT :- PHYSICS** DATE.........................................................
**CLASS :- 12th** NAME.........................................................
**CHAPTER :- ELECTROSTATE** SECTION.....................................................

## (SECTION-A)

**1.** Two charges $q_1$ and $q_2$ are placed in vacuum at a distance $d$ and the force acting between them is $F$. If a medium of dielectric constant 4 is introduced around them, the force now will be

(A) $4F$ (B) $2F$ (C) $\frac{F}{2}$ (D) $\frac{F}{4}$

**2.** The value of electric permittivity of free space is

(A) $9\times10^{9}\ NC^2/m^2$
(B) $8.85\times10^{-12}\ Nm^2/C^2 sec$
(C) $8.85\times10^{-12}\ C^2/Nm^2$
(D) $9\times10^{9}\ C^2/Nm^2$

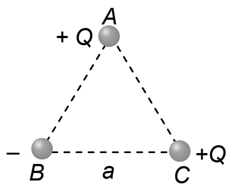
**3.** The force between two charges $0.06\,m$ apart is $5\,N$. If each charge is moved towards the other by $0.01\,m$, then the force between them will become

(A) $7.20\ N$ (B) $11.25\ N$
(C) $22.50\ N$ (D) $45.00\ N$

**4.** Number of electrons in one coulomb of charge will be

(A) $5.46\times10^{29}$ (B) $6.25\times10^{18}$
(C) $1.6\times10^{+19}$ (D) $9\times10^{11}$

**5.** Three charges are placed at the vertices of an equilateral triangle of side '*a*' as shown in the following figure. The force experienced by the charge placed at the vertex *A* in a direction normal to *BC* is




(A) $Q^2/(4\pi\varepsilon_0 a^2)$ (B) $-Q^2/(4\pi\varepsilon_0 a^2)$
(C) Zero (D) $Q^2/(2\pi\varepsilon_0 a^2)$

**6.** A body has – 80 *micro coulomb* of charge. Number of additional electrons in it will be

(A) $8\times10^{-5}$ (B) $80\times10^{-17}$
(C) $5\times10^{14}$ (D) $1.28\times10^{-17}$

**7.** A charge of *Q coulomb* is placed on a solid piece of metal of irregular shape. The charge will distribute itself

(A) Uniformly in the metal object
(B) Uniformly on the surface of the object
(C) Such that the potential energy of the system is minimised
(D) Such that the total heat loss is minimised

**8.** 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

**9.** Two small spheres each carrying a charge $q$ are placed $r$ metre apart. If one of the spheres is taken around the other one in a circular path of radius $r$, the work done will be equal to

(A) Force between them $\times r$
(B) Force between them $\times 2\pi r$
(C) Force between them $/2\pi r$
(D) Zero

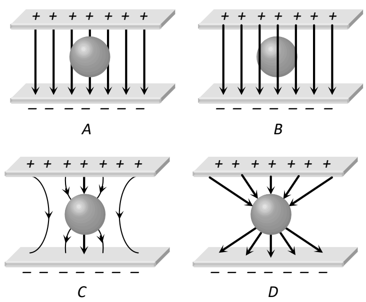
**10.** Electric lines of force about negative point charge are

(A) Circular, anticlockwise
(B) Circular, clockwise
(C) Radial, inward
(D) Radial, outward

**11.** Two plates are $2\,cm$ apart, a potential difference of $10\ volt$ is applied between them, the electric field between the plates is

(A) $20\ N/C$ (B) $500\ N/C$
(C) $5\ N/C$ (D) $250\ N/C$

**12.** An uncharged sphere of metal is placed in between two charged plates as shown. The lines of force look like




(A) $A$ (B) $B$ (C) $C$ (D) $D$

**13.** There is an electric field $E$ in *X*-direction. If the work done on moving a charge $0.2\,C$ through a distance of $2\,m$ along a line making an angle $60°$ with the *X*-axis is 4.0, what is the value of $E$

(A) $\sqrt{3}\ N/C$ (B) $4\ N/C$
(C) $5\ N/C$ (D) None of these

**14.** Angle between equipotential surface and lines of force is

(A) Zero (B) $180°$
(C) $90°$ (D) $45°$

**15.** The unit of intensity of electric field is

(A) $Newton\ /\ Coulomb$
(B) $Joule\ /\ Coulomb$
(C) $Volt - metre$
(D) $Newton\ /\ metre$

**16.** Equal charges are given to two spheres of different radii. The potential will

(A) Be more on the smaller sphere
(B) Be more on the bigger sphere
(C) Be equal on both the spheres
(D) Depend on the nature of the materials of the spheres

**17.** When a proton is accelerated through 1 *V*, then its kinetic energy will be

(A) 1840 *eV* (B) 13.6 *eV*
(C) 1 *eV* (D) 0.54 *eV*

**18.** Electric field strength due to a point charge of $5\mu C$ at a distance of 80 *cm* from the charge is

(A) $8\times10^{4}$ *N/C* (B) $7\times10^{4}$ *N/C*
(C) $5\times10^{4}$ *N/C* (D) $4\times10^{4}$ *N/C*

**19.** There is a solid sphere of radius '*R*' having uniformly distributed charge. What is the relation between electric field '*E*' (inside the sphere) and radius of sphere '*R*' is

(A) $E\propto R^{-2}$ (B) $E\propto R^{-1}$
(C) $E\propto\frac{1}{R^3}$ (D) $E\propto R^2$

**20.** Which of the following is deflected by electric field

(A) *X*-rays (B) $\gamma$ -rays
(C) Neutrons (D) $\alpha$ -particles

**21.** An electron enters in an electric field with its velocity in the direction of the electric lines of force. Then

(A) The path of the electron will be a circle
(B) The path of the electron will be a parabola
(C) The velocity of the electron will decrease
(D) The velocity of the electron will increase

**22.** The radius of a soap bubble whose potential is 16*V* is doubled. The new potential of the bubble will be

(A) 2*V* (B) 4*V*
(C) 8*V* (D) 16*V*

**23.** Two spheres *A* and *B* of radius '*a*' and '*b*' respectively are at same electric potential. The ratio of the surface charge densities of *A* and *B* is

(A) $\frac{a}{b}$ (B) $\frac{b}{a}$
(C) $\frac{a^2}{b^2}$ (D) $\frac{b^2}{a^2}$

**24.** Electric field intensity at a point in between two parallel sheets with like charges of same surface charge densities $(\sigma)$ is

(A) $\frac{\sigma}{2\varepsilon_0}$ (B) $\frac{\sigma}{\varepsilon_0}$
(C) Zero (D) $\frac{2\sigma}{\varepsilon_0}$

**25.** 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*

**26.** State which of the following is correct

(A) *Joule = coulomb × volt*
(B) *Joule = coulomb/volt*
(C) *Joule = volt × ampere*
(D) *Joule = volt/ampere*

**27.** When a charge of 3 *coulombs* is placed in a uniform electric field, it experiences a force of 3000 *Newton*. Within this field, potential difference between two points separated by a distance of 1 *cm* is

(A) 10 *volts* (B) 90 *volts*
(C) 1000 *volts* (D) 3000 *volts*

**28.** Electric potential of earth is taken to be zero because earth is a good

(A) Insulator (B) Conductor
(C) Semiconductor (D) Dielectric

**29.** The electric potential at a point on the axis of an electric dipole depends on the distance $r$ of the point from the dipole as

(A) $\propto\frac{1}{r}$ (B) $\propto\frac{1}{r^2}$
(C) $\propto r$ (D) $\propto\frac{1}{r^3}$

**30.** Two charges $+3.2\times10^{-19}$ and $-3.2\times10^{-19}\,C$ placed at $2.4\mathring{A}$ apart form an electric dipole. It is placed in a uniform electric field of intensity $4\times10^{5}\ volt/m$. The electric dipole moment is

(A) $15.36\times10^{-29}\ coulomb\times m$
(B) $15.36\times10^{-19}\ coulomb\times m$
(C) $7.68\times10^{-29}\ coulomb\times m$
(D) $7.68\times10^{-19}\ coulomb\times m$

**31.** Electric charges $q, q, -2q$ are placed at the corners of an equilateral triangle $ABC$ of side $l$. The magnitude of electric dipole moment of the system is

(A) $ql$ (B) $2ql$

(C) $\sqrt{3}ql$ (D) $4ql$

**32.** The electric intensity due to a dipole of length 10 *cm* and having a charge of $500\,\mu C$, at a point on the axis at a distance 20 *cm* from one of the charges in air, is

(A) $6.25 \times 10^7$ *N/C* (B) $9.28 \times 10^7$ *N/C*

(C) $13.1 \times 11^{11}$ *N/C* (D) $20.5 \times 10^7$ *N/C*

**33.** Two electric dipoles of moment *P* and 64 *P* are placed in opposite direction on a line at a distance of 25 *cm*. The electric field will be zero at point between the dipoles whose distance from the dipole of moment *P* is

(A) 5 *cm* (B) $\frac{25}{9}$ *cm*

(C) 10 *cm* (D) $\frac{4}{13}$ *cm*

**34.** An electric charge $q$ is placed at the centre of a cube of side $\alpha$. The electric flux on one of its faces will be

(A) $\frac{q}{6\varepsilon_0}$ (B) $\frac{q}{\varepsilon_0 a^2}$

(C) $\frac{q}{4\pi\varepsilon_0 a^2}$ (D) $\frac{q}{\varepsilon_0}$

**35.** It is not convenient to use a spherical Gaussian surface to find the electric field due to an electric dipole using Gauss's theorem because

(A) Gauss's law fails in this case

(B) This problem does not have spherical symmetry

(C) Coulomb's law is more fundamental than Gauss's law

(D) Spherical Gaussian surface will alter the dipole moment

**(SECTION-B)**

**36.** Eight dipoles of charges of magnitude $e$ are placed inside a cube. The total electric flux coming out of the cube will be

(A) $\frac{8e}{\varepsilon_0}$ (B) $\frac{16e}{\varepsilon_0}$

(C) $\frac{e}{\varepsilon_0}$ (D) Zero

**37.** Two infinite plane parallel sheets separated by a distance $d$ have equal and opposite uniform charge densities $\sigma$. Electric field at a point between the sheets is

(A) Zero

(B) $\frac{\sigma}{\varepsilon_0}$

(C) $\frac{\sigma}{2\varepsilon_0}$

(D) Depends upon the location of the point

**38.** Assertion : Electrons move away from a low potential to high potential region.
Reason : Because electrons has negative charge

(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(C) If assertion is true but reason is false.

(D) If the assertion and reason both are false.

**39.** Assertion : If a proton and an electron are placed in the same uniform electric field. They experience different acceleration.
Reason : Electric force on a test charge is independent of its mass.

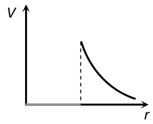
(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.

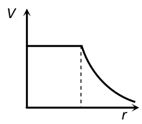
(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.

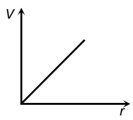
(C) If assertion is true but reason is false.

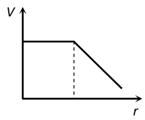
(D) If the assertion and reason both are false.

**40.** In a hollow spherical shell potential (*V*) changes with respect to distance (*r*) from centre

(A) 


(B) 


(C) 


(D) 


**41.** A positively charged ball hangs from a silk thread. We put a positive test charge $q_0$ at a point and measure $F/q_0$, then it can be predicted that the electric field strength $E$

(A) $> F/q_0$

(B) $= F/q_0$

(C) $< F/q_0$

(D) Cannot be estimated

**42.** A solid metallic sphere has a charge $+3Q$. Concentric with this sphere is a conducting spherical shell having charge $-Q$. The radius of the sphere is $a$ and that of the spherical shell is $b(b > a)$. What is the electric field at a distance $R(a < R < b)$ from the centre

(A) $\frac{Q}{2\pi\varepsilon_0 R}$ (B) $\frac{3Q}{2\pi\varepsilon_0 R}$

(C) $\frac{3Q}{4\pi\varepsilon_0 R^2}$ (D) $\frac{4Q}{4\pi\varepsilon_0 R^2}$

**43.** Electric potential is given by

$V = 6x - 8xy^2 - 8y + 6yz - 4z^2$

Then electric force acting on $2C$ point charge placed on origin will be

(A) $2N$ (B) $6N$

(C) $8N$ (D) $20\ N$

**44.** Two equal charges are separated by a distance *d*. A third charge placed on a perpendicular bisector at *x* distance will experience maximum coulomb force when

(A) $x = \frac{d}{\sqrt{2}}$ (B) $x = \frac{d}{2}$

(C) $x = \frac{d}{2\sqrt{2}}$ (D) $x = \frac{d}{2\sqrt{3}}$

**45.** One metallic sphere $A$ is given positive charge whereas another identical metallic sphere $B$ of exactly same mass as of $A$ is given equal amount of negative charge. Then

(A) Mass of $A$ and mass of $B$ still remain equal

(B) Mass of $A$ increases

(C) Mass of $B$ decreases

(D) Mass of $B$ increases

**46.** When a glass rod is rubbed with silk, it

(A) Gains electrons from silk

(B) Gives electrons to silk

(C) Gains protons from silk

(D) Gives protons to silk

**47.** Twenty seven drops of same size are charged at 220 V each. They combine to form a bigger drop. Calculate the potential of the bigger drop.

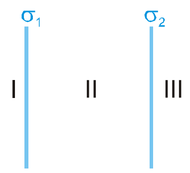
(A) 660 V (B) 1320 V

(C) 1520 V (D) 1980 V

**48.** The angle between the electric lines of force and the equipotential surface is

(A) 45° (B) 90° (C) 180° (D) 0°

**49.** Two parallel metallic plates have surface charge densities $\sigma_1$ and $\sigma_2$ as shown in figure.




**Column–I**

**(A)** If $\sigma_1 + \sigma_2 = 0$

**(B)** If $\sigma_1 + \sigma_2 > 0$

**(C)** If $\sigma_1 + \sigma_2 < 0$

**Column–II**

**(P)** Electric field in region III is towards right

**(Q)** Electric field in region I is zero

**(R)** Electric field in region I is towards right

**(S)** Nothing can be said

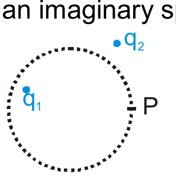
(A) A → P ; B→ Q → C→ S

(B) A → S ; B→ Q → C→ P

(C) A → R ; B→ P → C→ Q

(D) A → R ; B→ R → C→ P

**50.** In the figure shown P is a point on the surface of an imaginary sphere.




**Column–I**

**(A)** Electric field at point P

**(B)** Electric flux through a small area at P

**(C)** Electric flux through whole sphere

**Column–II**

**(P)** due to $q_1$ only

**(Q)** due to $q_2$ only

**(R)** due to both $q_1$ and $q_2$

(A) A → P ; B→ R ; C→ Q

(B) A→ R; B→ R ; C → P

(C) A → Q ; B→ R ; C→ P

(D) A → R ; B→ R ; C→ P