A Division of Aggarwal Educare
Aggarwal CLASSES™

Daily Practice Problems

JEE PHYSICS

Topic - Electrostatics -I

Q.1 On charging two metallic spheres of same mass -

[1] The mass of positively charged sphere increases

[2] The mass of both will remain same

[3] The mass of negatively charged sphere will increase

[4] None of the above

Q.2 The correct test for electrification is

[1] Attraction [2] Repulsion [3] Induction [4] Friction

Q.3 An electron at rest has a charge of 1.6×10^{-19}C. It starts moving with a velocity v = c/2, where c is the speed of light, then the new charge on it is -

[1] 1.6×10^{-19} Coulomb

[2] $1.6 \times 10^{-19}\sqrt{1-\left(\frac{1}{2}\right)^2}$ Coulomb

[3] $1.6 \times 10^{-19}\sqrt{\left(\frac{2}{1}\right)^2-1}$ Coulomb

[4] $\frac{1.6\times10^{-19}}{\sqrt{1-\left(\frac{1}{2}\right)^2}}$ Coulomb

Q.4 If 1000 electron are transferred from one sphere to another sphere of equal masses, then the difference in the mass of spheres will be -

[1] 1000 m_e [2] 2000 m_e [3] 1000m_p [4] 2000m_p

Q.5 When an insulated conducting sphere with 4 coulomb of charge, is placed quite close to the other uncharged sphere,then the charge produced on the other sphere in coulomb will be -

[1] –4 [2] +4 [3] –2 [4] +3

Q.6 The unit of electrical permittivity is -

[1] Farad/meter [2] Henery/metre [3] Volt/metre [4] Colomb/m^2

Q.7 Value of dielectric constant for metals is -

[1] One [2] More than one [3] Less than one [4] Infinite

Q.8 If the medium of dielectric constant K is placed in place of vacuum between the two charges, then the force between them will now -

[1] Be lesser by K times [2] Increase K times [3] Remains same [4] Increase by K^2 times

Q.9 The coulomb's law can be vectorically represented as -

[1] $\vec{F} = k\frac{q_1q_2}{r^2}$ [2] $\vec{F} = k\frac{q_1q_2}{r^2}\vec{r}$ [3] $\vec{F} = k\frac{q_1q_2}{r^3}\vec{r}$ [4] $\vec{F} = k\frac{q_1q_2}{r}\vec{r}$

Q.10 A force F is acting between charges placed in vacuum. If the glass plate of dielectric constant K = 6 is now placed between them, the force now will be -

[1] 6F [2] F/6 [3] Zero [4] F/36

Q.11 A force of 12 N is acting between two charges of +2μC and + 6μC. If both the charges are increased in value bu –2μC, then the force will now be -

[1] Zero [2] 3 N (attraction force) [3] 8 N (repulsion force) [4] 4 N (repulsion force)

Q.12 Four similar charges each of 2μC are placed at x = 0, 2, 4 and 8cm on X-axis.The force exerted on the charge in newton at x = 2 cm will be -

[1] 0 [2] 5 [3] 10 [4] 10^{-2}

Q.13 The dielectric constant of pure water is 81, then its absolute permittivity (coulomb^2/N-m^2) will be -

[1] 8.85×10^{-12} [2] 9×10^9 [3] 7.18×10^{-10} [4] $1/4\pi$

Q.14 Two charges of +1μC and +5μC are placed 4 cm apart, the ratio of the force exerted by both charges on each other will be -

[1] 1 : 1 [2] 1 : 5 [3] 5 : 1 [4] 25 : 1

Q. 15 The coulomb force between two charges q_1 and q_2 is $F = k\frac{q_1q_2}{r^2}$, where the value of k depends upon -

[1] Units only

[2] Medium between charges

[3] Both units as well as medium between charges

[4] Don't depend upon the units and medium between charges

Q.16 One electron and one proton are placed on a uniform electric field, the ratio of their acceleration will be -

[1] Unity [2] Zero

[3] Ratio of mass of electron and proton [4] Ratio of mass of proton and electron

Q.17 Unit of electric field intensity is newton/coloumb.The other unit of this can be -

[1] Vm [2] Vm^2 [3] V/m [4] V/m^2

Q.18 Two point charges of 9e and e are placed at a distance of 'r'. At what distance another charge q be kept away from 9e charge on the line joining the charges so that the system remains in equilibrium -

[1] r/4 [2] r/2 [3] 3r/4 [4] r/3

Q.19 Two horizontal plates charged with +q and –q charge are having an area of A m^2. A charged drop of oil is suspended in equilibrium position between the plates, then the charge on the oil drop will be -

[1] mg/q [2] mg/A [3] mg ε_0 A/q [4] mA ε_0 /q

Q.20 The rupture of air medium occurs at E = 3×10^6 volt/metre. The maximum charge that can be given to a sphere of radius 5 metre will be (in coulomb)

[1] 2×10^{-2} [2] 2×10^{-3} [3] 2×10^{-4} [4] 2×10^{-5}

Q.21 A charge Q is placed at the centre of a square.If electric field intensity due to charges at the corners of squares is E_1 and intensity at the midpoint of the side of square is E_2, then the ratio E_1/E_2 will be -

[1] $1/\sqrt{2}$ [2] $\sqrt{2}$ [3] 1/2 [4] 2

Q.22 Potential difference between two parallel plates is V volt. The distance between plates is d, the force exerted upon a test charge q placed midway between plates will be -

[1] qV/d [2] qd/V [3] V/qd [4] d/qV

Q.23 A body can be negatively charged by -

[1] Giving excess of electrons to it [2] Removing some electrons from it

[3] giving some protons to it [4] Removing some neutrons from it

Q.24 The tangent drawn at a point on a line of electric force shows the -

[1] Intensity of gravitational field [2] Intensity of magnetic field

[3] Intensity of electric field [4] Direction of electric field

Q.25 When no charge is confined with in the Gauss's surface, it implies that -

[1] E = 0 [2] $\vec{E}$ and $\vec{ds}$ are parallel

[3] $\vec{E}$ and $\vec{ds}$ are mutually perpendicular [4] $\vec{E}$ and $\vec{ds}$ are inclined at some angle

Q.26 If three electric dipoles are placed in some closed surface, then the electric flux emitting from the surface will be -

[1] Zero [2] Positive [3] Negative [4] None

Q.27 A charge q is placed at the centre of a closed cuboid.The flux emitting from any one face of the cube will be -

[1] $q/6\varepsilon_0$ [2] q/ε_0 [3] $q/2\varepsilon_0$ [4] $q/4\varepsilon_0$

Q.28 200 lines of force (M.K.S unit) are going outward the surface while 400 lines are entering (M.K.S unit) inward, then the total value of charge confined to the surface will be -

[1] -0.177×10^{-8} C [2] 0.177×10^{-8} C [3] $0.177 \times 10^{-8}/4\pi\varepsilon_0$ C [4] $-4\pi\varepsilon_0 \times 0.177 \times 10^{-8}$ C

Q.29 The total flux in Vm going out of the surface of area 1.4 m^2 inclined at an angle of 45º to the direction of uniform electric field of 0.3 V/m will be -

[1] 0.3 [2] 0.153 [3] 6.5 [4] 3.3

Q.30 The electric field intensity at a distance 'r' from an infinite linear charge of charge per unit length λ will be proportional to-

[1] 1/r [2] r [3] $1/r^2$ [4] r^2

Answer Key

Qus.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	3	2	1	2	1	1	4	1	3	2	1	3	3	1	3
Qus.	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Ans.	4	3	3	3	2	3	1	1	4	3	1	1	1	1	1