

PHYSICS · JEE MAIN

Electrostatics I — Charges, Field & Gauss's Law

Chapter-wise previous year questions, with answer key

46

PYQS

2020–2025

PAPERS

4

TOPICS

Gauss's Law and Applications

Electric Field

Coulomb's Law

Electric Field Lines and Flux

- 1 Attempt each question on paper first — they're grouped by topic, newest papers first.
- 2 Check yourself against the answer key at the end.
- 3 Got one wrong? Tap “Step-by-step solution” under it for the full working.

Stuck on a question?

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Gauss's Law and Applications · 20 PYQs

Q1 JEE Main 2025 · 7 Apr · Shift 2

Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) : The outer body of an aircraft is made of metal which protects persons sitting inside from lightning strikes.

Reason (R) : The electric field inside the cavity enclosed by a conductor is zero.

In the light of the above statements, choose the most appropriate answer from the options given below :

- (A) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
(B) (A) is correct but (R) is not correct
(C) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(D) (A) is not correct but (R) is correct

[Step-by-step solution ► prepwise.in/questions/Gew2I6DSYI](https://www.prepwise.in/questions/Gew2I6DSYI)

Q2 JEE Main 2025 · 29 Jan · Shift 1

Match List - I with List - II.

List - I	List - II
(A) Electric field inside (distance $r > 0$ from center) of a uniformly charged spherical shell with surface charge density σ , and radius R .	(I) σ/ϵ_0
(B) Electric field at distance $r > 0$ from a uniformly charged infinite plane sheet with surface charge density σ .	(II) $\sigma/2\epsilon_0$
(C) Electric field outside (distance $r > 0$ from center) of a uniformly charged spherical shell with surface charge density σ , and radius R .	(III) 0
(D) Electric field between 2 oppositely charged infinite plane parallel sheets with uniform surface charge density σ .	(IV) $\frac{\sigma}{\epsilon_0 r^2}$

Choose the correct answer from the options given below :

- (A) (A)-(IV), (B)-(I), (C)-(III), (D)-(II)
(B) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
(C) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
(D) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)

[Step-by-step solution ► prepwise.in/questions/Pov-0WNfy5](https://www.prepwise.in/questions/Pov-0WNfy5)

Q3 JEE Main 2025 · 29 Jan · Shift 2

A point charge causes an electric flux of $-2 \times 10^4 \text{ Nm}^2 \text{ C}^{-1}$ to pass through a spherical Gaussian surface of 8.0 cm radius, centred on the charge. The value of the point charge is :

(Given $\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$)

- (A) $17.7 \times 10^{-8} \text{ C}$ (B) $-17.7 \times 10^{-8} \text{ C}$
(C) $15.7 \times 10^{-8} \text{ C}$ (D) $-15.7 \times 10^{-8} \text{ C}$

[Step-by-step solution ► prepwise.in/questions/ydAgIkjdiS](https://www.prepwise.in/questions/ydAgIkjdiS)

Q4 JEE Main 2025 · 23 Jan · Shift 1

The electric flux is $\phi = \alpha\sigma + \beta\lambda$ where λ and σ are linear and surface charge density, respectively. $\left(\frac{\alpha}{\beta}\right)$ represents

- (A) displacement (B) charge
(C) electric field (D) area

[Step-by-step solution ► prepwiser.in/questions/IUO70hO_jr](https://www.prepwiser.in/questions/IUO70hO_jr)

Q5 JEE Main 2024 · 6 Apr · Shift 1

σ is the uniform surface charge density of a thin spherical shell of radius R . The electric field at any point on the surface of the spherical shell is :

- (A) $\sigma/\epsilon_0 R$ (B) σ/ϵ_0
(C) $\sigma/2\epsilon_0$ (D) $\sigma/4\epsilon_0$

[Step-by-step solution ► prepwiser.in/questions/epW-w2LER2](https://www.prepwiser.in/questions/epW-w2LER2)

Q6 JEE Main 2024 · 4 Apr · Shift 2

A charge q is placed at the center of one of the surface of a cube. The flux linked with the cube is:

- (A) $\frac{q}{2\epsilon_0}$ (B) Zero
(C) $\frac{q}{4\epsilon_0}$ (D) $\frac{q}{8\epsilon_0}$

[Step-by-step solution ► prepwiser.in/questions/tlRr8-H1p7](https://www.prepwiser.in/questions/tlRr8-H1p7)

Q7 JEE Main 2024 · 30 Jan · Shift 2

A particle of charge ' $-q$ ' and mass ' m ' moves in a circle of radius ' r ' around an infinitely long line charge of linear charge density ' $+\lambda$ '. Then time period will be given as :

(Consider k as Coulomb's constant)

- (A) $T^2 = \frac{4\pi^2 m}{2k\lambda q} r^3$
(B) $T = \frac{1}{2\pi r} \sqrt{\frac{m}{2k\lambda q}}$
(C) $T = \frac{1}{2\pi} \sqrt{\frac{2k\lambda q}{m}}$
(D) $T = 2\pi r \sqrt{\frac{m}{2k\lambda q}}$

[Step-by-step solution ► prepwiser.in/questions/7Vnp_ApLN6](https://www.prepwiser.in/questions/7Vnp_ApLN6)

Q8 JEE Main 2024 · 29 Jan · Shift 1

An electron is moving under the influence of the electric field of a uniformly charged infinite plane sheet S having surface charge density $+\sigma$. The electron at $t = 0$ is at a distance of 1m from S and has a speed of 1m/s . The maximum value of σ if the electron strikes S at $t = 1\text{s}$ is $\alpha \left[\frac{m\epsilon_0}{e} \right] \frac{C}{m^2}$, the value of α is

_____.

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/MYcNop8D8n](https://www.prepwiser.in/questions/MYcNop8D8n)

Q9 JEE Main 2024 · 29 Jan · Shift 1

Two charges of $5Q$ and $-2Q$ are situated at the points $(3a, 0)$ and $(-5a, 0)$ respectively. The electric flux through a sphere of radius ' $4a$ ' having center at origin is :

- (A) $\frac{2Q}{\epsilon_0}$ (B) $\frac{7Q}{\epsilon_0}$
(C) $\frac{3Q}{\epsilon_0}$ (D) $\frac{5Q}{\epsilon_0}$

Step-by-step solution ► [prepwiser.in/questions/yb7EWyOt83](https://www.prepwiser.in/questions/yb7EWyOt83)

Q10 JEE Main 2023 · 13 Apr · Shift 1

A thin infinite sheet charge and an infinite line charge of respective charge densities $+\sigma$ and $+\lambda$ are placed parallel at 5m distance from each other. Points 'P' and 'Q' are at $\frac{3}{\pi}\text{m}$ and $\frac{4}{\pi}\text{m}$ perpendicular distances from line charge towards sheet charge, respectively. ' E_P ' and ' E_Q ' are the magnitudes of resultant electric field intensities at point 'P' and 'Q', respectively. If $\frac{E_P}{E_Q} = \frac{4}{a}$ for $2|\sigma| = |\lambda|$, then the value of a is _____.

Numerical answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/XjFijUuPvZ](https://www.prepwiser.in/questions/XjFijUuPvZ)

Q11 JEE Main 2023 · 12 Apr · Shift 1

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R
Assertion A : If an electric dipole of dipole moment $30 \times 10^{-5}\text{Cm}$ is enclosed by a closed surface, the net flux coming out of the surface will be zero.

Reason R : Electric dipole consists of two equal and opposite charges.

In the light of above, statements, choose the correct answer from the options given below.

- (A) A is true but R is false
(B) A is false but R is true
(C) Both A and R are true but R is NOT the correct explanation of A
(D) Both A and R are true and R is the correct explanation of A

Step-by-step solution ► [prepwiser.in/questions/sIP5QNomBr](https://www.prepwiser.in/questions/sIP5QNomBr)

Q12 JEE Main 2023 · 11 Apr · Shift 2

A capacitor of capacitance C is charged to a potential V . The flux of the electric field through a closed surface enclosing the positive plate of the capacitor is :

- (A) Zero (B) $\frac{CV}{\epsilon_0}$
(C) $\frac{CV}{2\epsilon_0}$ (D) $\frac{2CV}{\epsilon_0}$

Step-by-step solution ► [prepwiser.in/questions/zqewXRpSlz](https://www.prepwiser.in/questions/zqewXRpSlz)

Q13 JEE Main 2023 · 10 Apr · Shift 1

Three concentric spherical metallic shells X, Y and Z of radius a , b and c respectively [$a < b < c$] have surface charge densities σ , $-\sigma$ and σ respectively. The shells X and Z are at same potential. If the radii of X & Y are 2 cm and 3 cm , respectively. The radius of shell Z is _____ cm .

Numerical answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/ZSL77jle90](https://www.prepwiser.in/questions/ZSL77jle90)

Q14 JEE Main 2023 · 29 Jan · Shift 2

For a charged spherical ball, electrostatic potential inside the ball varies with r as $V = 2ar^2 + b$.

Here, a and b are constant and r is the distance from the center. The volume charge density inside the ball is $-\lambda a\epsilon$. The value of λ is _____.

ϵ = permittivity of the medium

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/yk9d7EtO8S](https://www.prepwiser.in/questions/yk9d7EtO8S)

Q15 JEE Main 2022 · 26 Jul · Shift 2

Two uniformly charged spherical conductors A and B of radii 5mm and 10mm are separated by a distance of 2cm . If the spheres are connected by a conducting wire, then in equilibrium condition, the ratio of the magnitudes of the electric fields at the surface of the sphere A and B will be :

(A) 1 : 2

(B) 2 : 1

(C) 1 : 1

(D) 1 : 4

[Step-by-step solution ► prepwiser.in/questions/DcnHfsNPiY](https://www.prepwiser.in/questions/DcnHfsNPiY)

Q16 JEE Main 2022 · 26 Jun · Shift 2

Sixty four conducting drops each of radius 0.02 m and each carrying a charge of $5\text{ }\mu\text{C}$ are combined to form a bigger drop. The ratio of surface density of bigger drop to the smaller drop will be :

(A) 1 : 4

(B) 4 : 1

(C) 1 : 8

(D) 8 : 1

[Step-by-step solution ► prepwiser.in/questions/BpRMTk5yBh](https://www.prepwiser.in/questions/BpRMTk5yBh)

Q17 JEE Main 2022 · 24 Jun · Shift 2

A long cylindrical volume contains a uniformly distributed charge of density ρ . The radius of cylindrical volume is R . A charge particle (q) revolves around the cylinder in a circular path. The kinetic energy of the particle is :

(A) $\frac{\rho q R^2}{4\epsilon_0}$

(B) $\frac{\rho q R^2}{2\epsilon_0}$

(C) $\frac{q\rho}{4\epsilon_0 R^2}$

(D) $\frac{4\epsilon_0 R^2}{q\rho}$

[Step-by-step solution ► prepwiser.in/questions/rQQCR5SJFI](https://www.prepwiser.in/questions/rQQCR5SJFI)

Q18 JEE Main 2021 · 22 Jul · Shift 2

The total charge enclosed in an incremental volume of $2 \times 10^{-9}\text{ m}^3$ located at the origin is _____ nC, if electric flux density of its field is found as

$$D = e^{-x} \sin y \hat{i} - e^{-x} \cos y \hat{j} + 2z \hat{k} \text{ C/m}^2$$

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/enL3E87B6s](https://www.prepwiser.in/questions/enL3E87B6s)

Q19 JEE Main 2021 · 26 Feb · Shift 2

Given below are two statements:

Statement I : An electric dipole is placed at the center of a hollow sphere. The flux of the electric field through the sphere is zero but the electric field is not zero anywhere in the sphere.

Statement II : If R is the radius of a solid metallic sphere and Q be the total charge on it. The electric field at any point on the spherical surface of radius r ($< R$) is zero but the electric flux passing through this closed spherical surface of radius r is not zero..

In the light of the above statements, choose the correct answer from the options given below :

- (A) Both Statement I and Statement II are true
- (B) Statement I is false but Statement II is true
- (C) Statement I is true but Statement II is false
- (D) Both Statement I and Statement II are false

[Step-by-step solution ► prepwisser.in/questions/LD1m2QAwGT](https://www.prepwisser.in/questions/LD1m2QAwGT)

Q20 JEE Main 2020 · 8 Jan · Shift 1

In finding the electric field using Gauss Law the formula

$$|\vec{E}| = \frac{q_{enc}}{\epsilon_0 |A|}$$

is applicable. In the formula ϵ_0 is permittivity of free space, A is the area of Gaussian surface and q_{enc} is charge enclosed by the Gaussian surface. The equation can be used in which of the following situation?

- (A) Only when $|\vec{E}| = \text{constant}$ on the surface.
- (B) For any choice of Gaussian surface.
- (C) Only when the Gaussian surface is an equipotential surface.
- (D) Only when the Gaussian surface is an equipotential surface and $|\vec{E}|$ is constant on the surface.

[Step-by-step solution ► prepwisser.in/questions/d-pcOj8iI4](https://www.prepwisser.in/questions/d-pcOj8iI4)

Electric Field · 14 PYQs

Q21 JEE Main 2025 · 7 Apr · Shift 2

A dipole with two electric charges of $2 \mu\text{C}$ magnitude each, with separation distance $0.5 \mu\text{m}$, is placed between the plates of a capacitor such that its axis is parallel to an electric field established between the plates when a potential difference of 5 V is applied. Separation between the plates is 0.5 mm . If the dipole is rotated by 30° from the axis, it tends to realign in the direction due to a torque. The value of torque is:

- (A) $2.5 \times 10^{-9} \text{ Nm}$
- (B) $2.5 \times 10^{-12} \text{ Nm}$
- (C) $5 \times 10^{-3} \text{ Nm}$
- (D) $5 \times 10^{-9} \text{ Nm}$

[Step-by-step solution ► prepwisser.in/questions/wqCSp7_I3C](https://www.prepwisser.in/questions/wqCSp7_I3C)

Q22 JEE Main 2025 · 2 Apr · Shift 2

Consider a circular loop that is uniformly charged and has a radius $a\sqrt{2}$. Find the position along the positive z -axis of the cartesian coordinate system where the electric field is maximum if the ring was assumed to be placed in xy plane at the origin :

- (A) a
- (B) $a/2$
- (C) 0
- (D) $a/\sqrt{2}$

[Step-by-step solution ► prepwiser.in/questions/j63e6sk0oP](https://www.prepwiser.in/questions/j63e6sk0oP)

Q23 JEE Main 2025 · 29 Jan · Shift 1

An electric dipole of mass m , charge q , and length l is placed in a uniform electric field $\vec{E} = E_0 \hat{i}$. When the dipole is rotated slightly from its equilibrium position and released, the time period of its oscillations will be :

- (A) $\frac{1}{2\pi} \sqrt{\frac{ml}{2qE_0}}$
- (B) $2\pi \sqrt{\frac{ml}{2qE_0}}$
- (C) $2\pi \sqrt{\frac{ml}{qE_0}}$
- (D) $\frac{1}{2\pi} \sqrt{\frac{2ml}{qE_0}}$

[Step-by-step solution ► prepwiser.in/questions/DgEWQVi97K](https://www.prepwiser.in/questions/DgEWQVi97K)

Q24 JEE Main 2024 · 5 Apr · Shift 2

The vehicles carrying inflammable fluids usually have metallic chains touching the ground:

- (A) To protect tyres from catching dirt from ground
- (B) It is a custom
- (C) To alert other vehicles
- (D) To conduct excess charge due to air friction to ground and prevent sparking

[Step-by-step solution ► prepwiser.in/questions/0toIghZnt1](https://www.prepwiser.in/questions/0toIghZnt1)

Q25 JEE Main 2023 · 15 Apr · Shift 1

The electric field due to a short electric dipole at a large distance (r) from center of dipole on the equatorial plane varies with distance as :

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

[Step-by-step solution ► prepwiser.in/questions/ORaQVRRarD](https://www.prepwiser.in/questions/ORaQVRRarD)

Q26 JEE Main 2023 · 13 Apr · Shift 1

Two charges each of magnitude 0.01C and separated by a distance of 0.4mm constitute an electric dipole. If the dipole is placed in an uniform electric field ' $\vec{E}$ ' of 10 dyne/C making 30° angle with $\vec{E}$, the magnitude of torque acting on dipole is:

- (A) $4 \cdot 0 \times 10^{-10}\text{Nm}$
- (B) $1.5 \times 10^{-9}\text{Nm}$
- (C) $1.0 \times 10^{-8}\text{Nm}$
- (D) $2.0 \times 10^{-10}\text{Nm}$

[Step-by-step solution ► prepwiser.in/questions/eiHIFG21ey](https://www.prepwiser.in/questions/eiHIFG21ey)

Q27 JEE Main 2023 · 30 Jan · Shift 1

Electric field in a certain region is given by

$$\vec{E} = \left(\frac{A}{x^2} \hat{i} + \frac{B}{y^3} \hat{j} \right). \text{ The SI unit of A and B}$$

are :

- (A) $\text{Nm}^2\text{C}; \text{Nm}^3\text{C}$
- (B) $\text{Nm}^3\text{C}^{-1}; \text{Nm}^2\text{C}^{-1}$
- (C) $\text{Nm}^3\text{C}; \text{Nm}^2\text{C}$
- (D) $\text{Nm}^2\text{C}^{-1}; \text{Nm}^3\text{C}^{-1}$

[Step-by-step solution ► prepwiser.in/questions/UEWWIIM8PX](https://www.prepwiser.in/questions/UEWWIIM8PX)

Q28 JEE Main 2022 · 29 Jul · Shift 1

Given below are two statements.

Statement I : Electric potential is constant within and at the surface of each conductor.

Statement II : Electric field just outside a charged conductor is perpendicular to the surface of the conductor at every point.

In the light of the above statements, choose the most appropriate answer from the options given below.

- (A) Both Statement I and Statement II are correct
- (B) Both Statement I and Statement II are incorrect
- (C) Statement I is correct but Statement II is incorrect
- (D) Statement I is incorrect but Statement II is correct

[Step-by-step solution ► prepwiser.in/questions/3TDhixWX2Z](https://www.prepwiser.in/questions/3TDhixWX2Z)

Q29 JEE Main 2022 · 28 Jul · Shift 1

Two electric dipoles of dipole moments $1.2 \times 10^{-30} \text{ Cm}$ and $2.4 \times 10^{-30} \text{ Cm}$ are placed in two different uniform electric fields of strengths $5 \times 10^4 \text{ NC}^{-1}$ and $15 \times 10^4 \text{ NC}^{-1}$ respectively. The ratio of maximum torque experienced by the electric dipoles will be $\frac{1}{x}$. The value of x is _____.

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/JbKMtt5kiM](https://www.prepwiser.in/questions/JbKMtt5kiM)

Q30 JEE Main 2022 · 29 Jun · Shift 1

A positive charge particle of 100 mg is thrown in opposite direction to a uniform electric field of strength $1 \times 10^5 \text{ NC}^{-1}$. If the charge on the particle is $40 \mu\text{C}$ and the initial velocity is 200 ms^{-1} , how much distance it will travel before coming to the rest momentarily :

- (A) 1 m
- (B) 5 m
- (C) 10 m
- (D) 0.5 m

[Step-by-step solution ► prepwiser.in/questions/5ET6znK_Mw](https://www.prepwiser.in/questions/5ET6znK_Mw)

Q31 JEE Main 2022 · 28 Jun · Shift 1

Given below are two statements :

Statement I : A point charge is brought in an electric field. The value of electric field at a point near to the charge may increase if the charge is positive.

Statement II : An electric dipole is placed in a non-uniform electric field. The net electric force on the dipole will not be zero.

Choose the correct answer from the options given below :

(A) Both Statement I and Statement II are true.

(B) Both Statement I and Statement II are false.

(C) Statement I is true but Statement II is false.

(D) Statement I is false but Statement II is true.

[Step-by-step solution ► prepwiser.in/questions/nNik7ku662](https://www.prepwiser.in/questions/nNik7ku662)

Q32 JEE Main 2022 · 24 Jun · Shift 1

A vertical electric field of magnitude 4.9×10^5 N/C just prevents a water droplet of a mass 0.1 g from falling. The value of charge on the droplet will be :

(Given : $g = 9.8 \text{ m/s}^2$)

(A) $1.6 \times 10^{-9} \text{ C}$

(B) $2.0 \times 10^{-9} \text{ C}$

(C) $3.2 \times 10^{-9} \text{ C}$

(D) $0.5 \times 10^{-9} \text{ C}$

[Step-by-step solution ► prepwiser.in/questions/FW8rv6S0hP](https://www.prepwiser.in/questions/FW8rv6S0hP)

Q33 JEE Main 2021 · 16 Mar · Shift 2

Find out the surface charge density at the intersection of point $x = 3 \text{ m}$ plane and x -axis, in the region of uniform line charge of 8 nC/m lying along the z -axis in free space.

(A) 0.424 nC m^{-2}

(B) 4.0 nC m^{-2}

(C) 47.88 C/m

(D) 0.07 nC m^{-2}

[Step-by-step solution ► prepwiser.in/questions/CciH-IVLUL](https://www.prepwiser.in/questions/CciH-IVLUL)

Q34 JEE Main 2020 · 9 Jan · Shift 1

An electric dipole of moment

$$\vec{p} = (-\hat{i} - 3\hat{j} + 2\hat{k}) \times 10^{-29}$$

C.m is

at the origin (0, 0, 0). The electric field due to this dipole at

$\vec{r} = +\hat{i} + 3\hat{j} + 5\hat{k}$ (note that $\vec{r} \cdot \vec{p} = 0$) is parallel to :

- (A) $(+\hat{i} + 3\hat{j} - 2\hat{k})$
- (B) $(+\hat{i} - 3\hat{j} - 2\hat{k})$
- (C) $(-\hat{i} + 3\hat{j} - 2\hat{k})$
- (D) $(-\hat{i} - 3\hat{j} + 2\hat{k})$

[Step-by-step solution ► prepwiser.in/questions/PdMgMEBuYo](https://www.prepwiser.in/questions/PdMgMEBuYo)

Coulomb's Law · 6 PYQs

Q35 JEE Main 2024 · 6 Apr · Shift 2

Two identical conducting spheres P and S with charge Q on each, repel each other with a force 16N. A third identical uncharged conducting sphere R is successively brought in contact with the two spheres. The new force of repulsion between P and S is :

- (A) 1 N
- (B) 6 N
- (C) 12 N
- (D) 4 N

[Step-by-step solution ► prepwiser.in/questions/7YysOoYRXs](https://www.prepwiser.in/questions/7YysOoYRXs)

Q36 JEE Main 2024 · 5 Apr · Shift 1

In hydrogen like system the ratio of coulombian force and gravitational force between an electron and a proton is in the order of :

- (A) 10^{19}
- (B) 10^{39}
- (C) 10^{29}
- (D) 10^{36}

[Step-by-step solution ► prepwiser.in/questions/MNOoZoQkYw](https://www.prepwiser.in/questions/MNOoZoQkYw)

Q37 JEE Main 2024 · 31 Jan · Shift 2

Force between two point charges q_1 and q_2 placed in vacuum at 'r' cm apart is F. Force between them when placed in a medium having dielectric constant $K = 5$ at 'r/5' cm apart will be:

- (A) $5F$
- (B) $25F$
- (C) $F/5$
- (D) $F/25$

[Step-by-step solution ► prepwiser.in/questions/n1zejWejDP](https://www.prepwiser.in/questions/n1zejWejDP)

Q38 JEE Main 2023 · 13 Apr · Shift 2

A $10\mu\text{C}$ charge is divided into two parts and placed at 1cm distance so that the repulsive force between them is maximum. The charges of the two parts are:

- (A) $9\mu\text{C}, 1\mu\text{C}$ (B) $5\mu\text{C}, 5\mu\text{C}$
(C) $8\mu\text{C}, 2\mu\text{C}$ (D) $7\mu\text{C}, 3\mu\text{C}$

[Step-by-step solution ► prepwiser.in/questions/Kl3AZ8rGJm](https://www.prepwiser.in/questions/Kl3AZ8rGJm)

Q39 JEE Main 2023 · 31 Jan · Shift 2

Considering a group of positive charges, which of the following statements is correct ?

- (A) Net potential of the system cannot be zero at a point but net electric field can be zero at that point
(B) Net potential of the system at a point can be zero but net electric field can't be zero at that point.
(C) Both the net potential and the net electric field cannot be zero at a point.
(D) Both the net potential and the net field can be zero at a point.

[Step-by-step solution ► prepwiser.in/questions/pabwKymI4u](https://www.prepwiser.in/questions/pabwKymI4u)

Q40 JEE Main 2022 · 29 Jun · Shift 2

Two point charges Q each are placed at a distance d apart. A third point charge q is placed at a distance x from mid-point on the perpendicular bisector. The value of x at which charge q will experience the maximum Coulomb's force is :

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

[Step-by-step solution ► prepwiser.in/questions/q-a2iNbudL](https://www.prepwiser.in/questions/q-a2iNbudL)

Electric Field Lines and Flux · 6 PYQs

Q41 JEE Main 2025 · 7 Apr · Shift 2

The electric field in a region is given by $\vec{E} = (2\hat{i} + 4\hat{j} + 6\hat{k}) \times 10^3 \text{N/C}$. The flux of the field through a rectangular surface parallel to $x - z$ plane is $6.0 \text{Nm}^2\text{C}^{-1}$. The area of the surface is _____ cm^2 .

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/RSOKkF51vF](https://www.prepwiser.in/questions/RSOKkF51vF)

Q42 JEE Main 2024 · 8 Apr · Shift 1

An electric field, $\vec{E} = \frac{2\hat{i} + 6\hat{j} + 8\hat{k}}{\sqrt{6}}$ passes through the surface of 4m^2 area having unit vector $\hat{n} = \left(\frac{2\hat{i} + \hat{j} + \hat{k}}{\sqrt{6}}\right)$.

The electric flux for that surface is _____ Vm .

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/PKRug7ygYe](https://www.prepwiser.in/questions/PKRug7ygYe)

Q43 JEE Main 2024 · 29 Jan · Shift 2

An electric field is given by $(6\hat{i} + 5\hat{j} + 3\hat{k})\text{N/C}$. The electric flux through a surface area $30\hat{i}\text{m}^2$ lying in YZ -plane (in SI unit) is :

- (A) 60 (B) 90
(C) 180 (D) 150

[Step-by-step solution ► prepwiser.in/questions/IJdHGDmsxP](https://www.prepwiser.in/questions/IJdHGDmsxP)

Q44 JEE Main 2022 · 25 Jul · Shift 1

The volume charge density of a sphere of radius 6m is $2 \mu\text{C cm}^{-3}$. The number of lines of force per unit surface area coming out from the surface of the sphere is _____ $\times 10^{10} \text{ NC}^{-1}$.

[Given : Permittivity of vacuum

$$\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$$

)

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/uQV5zhE6dk](https://www.prepwiser.in/questions/uQV5zhE6dk)

Q45 JEE Main 2021 · 17 Mar · Shift 2

The electric field in a region is given by $\vec{E} = \frac{2}{5}E_0\hat{i} + \frac{3}{5}E_0\hat{j}$ with $E_0 = 4.0 \times 10^3 \frac{\text{N}}{\text{C}}$. The flux of this field through a rectangular surface area 0.4 m^2 parallel to the Y-Z plane is _____ Nm^2C^{-1} .

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/CgC3lN8Ysj](https://www.prepwiser.in/questions/CgC3lN8Ysj)

Q46 JEE Main 2021 · 25 Feb · Shift 1

The electric field in a region is given by

$$\vec{E} = \left(\frac{3}{5}E_0\hat{i} + \frac{4}{5}E_0\hat{j} \right) \frac{N}{C}$$

. The ratio of flux of reported field through the rectangular surface of area 0.2 m^2 (parallel to y – z plane) to that of the surface of area 0.3 m^2 (parallel to x – z plane) is a : b, where a = _____ [Here $\hat{i}$, $\hat{j}$ and $\hat{k}$ are unit vectors along x, y and z-axes respectively.]

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/vNvStEE6oB](https://www.prepwiser.in/questions/vNvStEE6oB)

Answer key — Electrostatics I — Charges, Field & Gauss's Law

Numbers match the question numbers above. For full working, open the solution link under each question.

1	C	2	C	3	B	4	A	5	B	6	A	7	D	8	8
9	D	10	6	11	D	12	B	13	5	14	12	15	B	16	B
17	A	18	4	19	C	20	D	21	D	22	A	23	B	24	D
25	D	26	D	27	D	28	A	29	6	30	D	31	A	32	B
33	A	34	A	35	B	36	B	37	A	38	B	39	A	40	D
41	15	42	12	43	C	44	45	45	640	46	1				

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