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## EdLoop EAPCET

PHYSICS · EAPCET (EAMCET)

# Electrostatics

## Previous Year Questions with answers

**277** questions · **146** papers · **2010–2026** · newest paper first

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**What is in this PDF:** every Electrostatics question we hold from past AP and TS EAPCET (called EAMCET until 2020 in Andhra Pradesh and 2023 in Telangana) papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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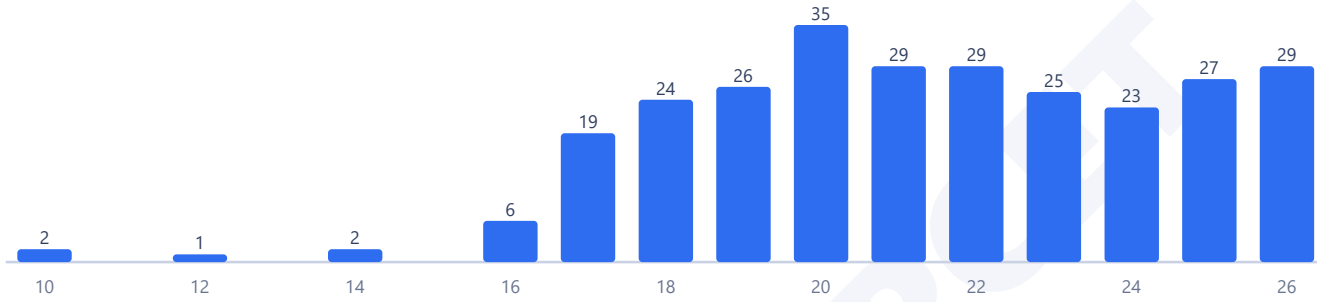
# Chapter at a glance

| 4.3% | 277 | 77 of 77 | 277 / 0 |
|---|---|---|---|
| of Physics questions, 2022–2026 | questions, 2010–2026 | papers asked it, 2022–2026 | MCQ / numerical, 2010–2026 |

**Trend.** Steady: 1.7 questions per paper in 2024–2026 against 1.7 in 2022–2023.

### Questions per year




Counts are the questions we hold: 277 in 146 papers. No question in this chapter was found repeated across papers.

### Most-asked topics in this chapter (2010–2026)

| | |
|---|---|
| Electric Potential | 86 |
| Gauss's Law | 57 |
| Electric Field | 48 |
| Charge & Coulomb's Law | 45 |
| Electric Dipole | 23 |

## How often it comes up

Electrostatics opens the Class 12 physics syllabus as a high-volume foundational chapter. In our archive of AP and TS EAPCET papers from 2022 to 2026, Electrostatics contributed 133 questions across 77 papers. That gives an average frequency of 1.7 questions per paper, claiming 4.3% of all physics questions in that recent window. Looking over the complete historical span from 2010 to 2026, Electrostatics produced 277 questions across 149 papers, maintaining an average of 1.9 questions per paper and a 4.6% subject share. Across the earlier testing period from 2010 to 2021, our archive contains 144 questions across 72 papers (5.0% share). Over the last three exam years from 2024 to 2026, the chapter delivered 79 questions across 46 papers, holding a 4.3% share. The share of the subject in the last three years compared to early papers is down, while compared to the recent five-year window it is about the same.

State-wise tallies show steady testing in both regions, with higher density in Andhra Pradesh. Between 2022 and 2026, AP EAPCET papers in our set contributed 93 questions across 48 papers, averaging 1.9 questions per paper and taking 4.8% of the AP physics section. TS EAPCET delivered 40 questions across 29 papers in our set, averaging 1.4 questions per paper and claiming 3.4% of TS physics questions. Electrostatics has appeared every year since 2022 and featured in every paper across both states in the recent five-year window. The chapter ranks 8th of 28 physics chapters by question share between 2022 and 2026. The busiest single sitting in our collection was 2020, with 35 questions across 18 papers.

## Most-asked topics

Questions distribute across six distinct syllabus areas:

- **Electric Potential**: This primary section brought 44 questions in the recent five-year period, contributing to 86 questions across the full archive. Key concepts test scalar potential from point charges, potential energy of charge

systems, equipotential surfaces, and work done moving charges.

- **Gauss's Law**: Recent examinations supplied 30 questions, out of 57 questions in the complete record. It covers electric flux through closed geometries, cylindrical charge distributions, infinite plane sheets, and concentric spherical shells.
- **Electric Field**: A block of 21 questions appeared between 2022 and 2026, out of 48 questions across all years in our archive. Questions evaluate field vectors from discrete point arrays, neutral points, and trajectories of charged particles in uniform fields.
- **Charge & Coulomb's Law**: Examiners set 20 questions recently, out of 45 questions overall. Topics include Coulomb's inverse-square law, vector superposition of electrostatic forces, and equilibrium of suspended pith balls.
- **Conductors**: Recent papers featured 10 questions, bringing the all-time count to 18 questions. It tests induced surface charges, cavity shielding, grounding, and concentric conducting shells.
- **Electric Dipole**: A focused pool of 8 questions appeared recently, out of 23 questions across the entire archive. It tests axial and equatorial fields, torque in uniform fields, and potential energy of dipoles.

## What the questions look like

Equipotential surfaces and zero-potential locations appear repeatedly. A standard problem gives two charges of opposite signs and unequal magnitudes placed along an axis and asks for the geometric locus or specific points where the net electrostatic potential drops to zero. Another frequent setup asks for the work required to assemble three or four identical charges at the vertices of an equilateral triangle or square.

Gauss's law problems frequently combine electrostatics with orbital dynamics. For example, an electron or charged particle orbits an infinitely long line charge of uniform linear density, requiring students to equate electrostatic attraction with centripetal force. In spherical conductor problems, examiners place charges on nested concentric metallic shells and ask for outer surface charge densities or the electric potential on intermediate surfaces before and after grounding.

## How to practise it

Start by mastering Coulomb's law and vector superposition. For charges in a medium of dielectric constant K, the electrostatic force is reduced by a factor of K. When resolving equilibrium of two identical charged spheres suspended by light strings of length L making angle θ with the vertical, set tan θ = F_e / (m g). For small angles where tan θ ≈ sin θ = x / (two L), separation distance x scales as the cube root of charge squared.

Next, practise electric potential and field relations. Remember that electric field is the negative spatial gradient of electric potential, E = - dV/dr. For discrete point charges, potential is a scalar sum V = Σ (q_i / (four π ε_zero r_i)), requiring no vector resolution. Work done by an external agent moving charge q from point A to point B without acceleration is W_ext = q (V_B - V_A).

Finally, master Gauss's law applications. For an infinite line of linear charge density λ, the radial field is E = λ / (two π ε_zero r). For an infinite non-conducting sheet of surface charge density σ, the uniform field is E = σ / (two ε_zero). For a conducting or non-conducting spherical shell of radius R carrying charge Q, the field outside is identical to a point charge, while the field inside a conducting shell vanishes completely, maintaining constant potential throughout the interior cavity.

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**Q1** AP EAPCET 2026 · 18 May · Shift 1 MCQ

Two large circular metal plates each of radius 50 cm carrying equal and unlike charges are parallel to each other. If the electric field between the plates is $720\ \mathrm{NC}^{-1}$, then the magnitude of charge on any one plate is

(A) 7.5 nC
(B) 10 nC
(C) 2.5 nC
(D) 5 nC

**Answer: (D)** 5 nC · The council's preliminary key

**Q2** AP EAPCET 2026 · 18 May · Shift 2 MCQ

The net outward flux through surface of a box is $8.0 \times 10^3\ \mathrm{Nm^2C^{-1}}$.
The net charge inside the box is (approximately)

(A) $70\ nC$
(B) $42\ nC$
(C) $21\ nC$
(D) $60\ nC$

**Answer: (A)** $70\ nC$ · The council's preliminary key

**Q3** AP EAPCET 2026 · 18 May · Shift 2 MCQ

$1\mu C, -1\mu C$ charges are placed at a distance of $5\ cm$ in forming a dipole. The amount of torque required to place this dipole perpendicular to an electric field of $3 \times 10^5 NC^{-1}$ is given by

(A) $5 \times 10^{-3} N.m$
(B) $15 \times 10^{-3} N.m$
(C) $1 \times 10^{-3} N.m$
(D) $10 \times 10^{-3} N.m$

**Answer: (B)** $15 \times 10^{-3} N.m$ · The council's preliminary key

**Q4** AP EAPCET 2026 · 18 May · Shift 2 MCQ

A particle of charge 'q' and mass 'm' starts moving from the origin under the action of electric field, $\vec{E} = E_0\hat{i}$ with a velocity $v = v_0\hat{j}$. The time taken to increase its velocity to $\frac{\sqrt{5}}{2}v_0$ is

(A) $\frac{mv_0}{qE_0}$
(B) $\frac{mv_0}{2qE_0}$
(C) $\frac{\sqrt{3}mv_0}{2qE_0}$
(D) $\frac{\sqrt{5}mv_0}{2qE_0}$

**Answer: (B)** $\frac{mv_0}{2qE_0}$ · The council's preliminary key

## Q5 AP EAPCET 2026 · 15 May · Shift 1 MCQ

Two similar rods of length $l = 1m$ carrying equal charges $(q) = 10^{-8}C$ are placed as shown in figure. The electric field at point '$O$' approximately is, if $d = 0.25m$

*(see the figure above)*

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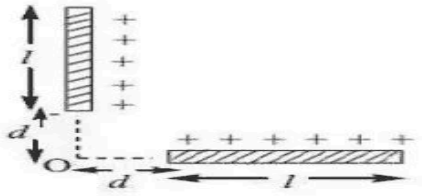



$1m$ పొడవు గల రెండు సమాన కడ్డీలు $(q) = 10^{-8}C$ ఆవేశము కలిగి, పటంలో చూపిన విధంగా అమర్చబడ్డాయి. $d = 0.25m$ అయితే, '$O$' బిందువు వద్ద విద్యుత్ క్షేత్ర విలువ

**Options :**

1. $450\ Vm^{-1}$
2. $568\ Vm^{-1}$
3. $406\ Vm^{-1}$
4. $203\ Vm^{-1}$

(A) $450\ Vm^{-1}$
(B) $568\ Vm^{-1}$
(C) $406\ Vm^{-1}$
(D) $203\ Vm^{-1}$

**Answer: (C)** $406\ Vm^{-1}$ · The council's preliminary key

## Q6 AP EAPCET 2026 · 15 May · Shift 1 MCQ

The work done to keep three charges $2 \times 10^{-5}$ C, $3 \times 10^{-5}$ C, $4 \times 10^{-5}$ C at vertices of an equivalent triangle of side 10 cm is

(A) 324 J
(B) 234 J
(C) 432 J
(D) 224 J

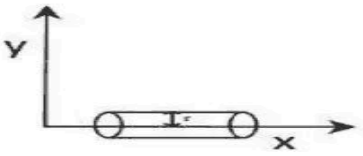
**Answer: (B) 234 J** · The council's preliminary key

**Q7** AP EAPCET 2026 · 15 May · Shift 2 MCQ

A cylinder of radius 50 cm and length 2m is placed along $x$-axis as shown in the figure. If electric field is $70\,\hat{i}$ along its axis, the electric flux through the left face of the cylinder is

*(see the figure above)*

A cylinder of radius 50 cm and length 2m is placed along $x$-axis as shown in the figure. If electric field is $70\,\hat{i}$ along its axis, the electric flux through the left face of the cylinder is




పటంలో చూపబడినట్లు ఒక 50 cm వ్యాసార్ధం గల 2m పొడవు గల స్థూపం యొక్క అక్షం $x$-అక్షం దిశలో ఉన్నది. దాని అక్షంపై విద్యుత్ క్షేత్ర తీవ్రత $70\,\hat{i}$ అయితే, ఆ స్థూపం ఎడమ ముఖం గుండా విద్యుత్ అభివాహం?

Options :

1. 50
2. 52
3. 55
4. 58

(A) 50
(B) 52
(C) 55
(D) 58

**Answer: (C) 55** · The council's preliminary key

**Q8** AP EAPCET 2026 · 15 May · Shift 2 MCQ

Find the potential difference $V_P - V_Q$ between the points P(-1,2,0) and Q(2,0,3) in a uniform electric field $\bar{E} = (3\,\hat{i} + 4\,\hat{j} + 5\,\hat{k})\ \mathrm{NC}^{-1}$

(A) 16 V
(B) -16V
(C) 4V
(D) -4V

**Answer: (A)** 16 V · The council's preliminary key

**Q9** AP EAPCET 2026 · 14 May · Shift 1 MCQ

Two electric charges $+3.2 \times 10^{-19}$ C and $-3.2 \times 10^{-19}$ C are placed 2.4 Å apart form an electric dipole. It is placed in uniform electric field of intensity $4 \times 10^{5}$ V/m. The work done to rotate the electric dipole from the equilibrium position by $180^{0}$ is

(A) $3 \times 10^{-25}$ J
(B) $6 \times 10^{-23}$ J
(C) $12 \times 10^{-23}$ J
(D) Zero

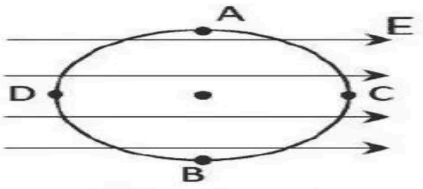
**Answer: (B)** $6 \times 10^{-23}$ J · The council's preliminary key

**Q10** AP EAPCET 2026 · 14 May · Shift 1 MCQ

A circle of radius r is drawn in a uniform electric field E as shown in figure. If $V_A$, $V_B$, $V_C$ & $V_D$ are the potentials at A, B, C & D respectively. Then

*(see the figure above)*

A circle of radius r is drawn in a uniform electric field E as shown in figure. If $V_A$, $V_B$, $V_C$ & $V_D$ are the potentials at A, B, C & D respectively. Then




తీవ్రత E గల ఏకరీతి విద్యుత్ క్షేత్రంలో r వ్యాసార్ధం గల ఒక వృత్తం పటంలో చూపిన విధంగా గీయబడినది. $V_A$, $V_B$, $V_C$ మరియు $V_D$ లు వరుసగా వృత్తంపై A, B, C మరియు D బిందువుల వద్ద పొటెన్షియల్ ను సూచిస్తే, క్రిందివాటి లో సరియైన దానిని గుర్తించండి

**Options :**

1. $V_A = V_B, V_C = V_D$
2. $V_A = V_B, V_C > V_D$
3. $V_A = V_B, V_C < V_D$
4. $V_A > V_B, V_C = V_D$

(A) $V_A = V_B,\ V_C = V_D$
(B) $V_A = V_B,\ V_C > V_D$
(C) $V_A = V_B,\ V_C < V_D$
(D) $V_A > V_B,\ V_C = V_D$

**Answer: (C)** $V_A = V_B,\ V_C < V_D$ · The council's preliminary key

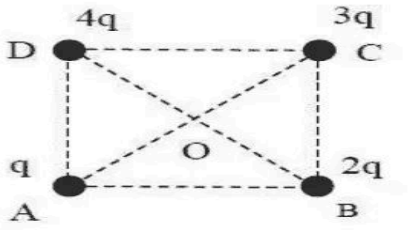
## Q11 AP EAPCET 2026 · 14 May · Shift 2 MCQ

Charges q, 2q, 3q and 4q are placed at the corners A, B, C and D of a square as shown in the figure. The direction of electric field at the centre 'O' of the square is along

*(see the figure above)*

Charges q, 2q, 3q and 4q are placed at the corners A, B, C and D of a square as shown in the figure. The direction of electric field at the centre 'O' of the square is along

చతురస్రం మూలలు A, B, C మరియు D ల వద్ద వరుసగా q, 2q, 3q మరియు 4q ఆవేశాలు పటంలో చూపినట్లు ఉంచబడ్డాయి. చతురస్ర కేంద్రం 'O' వద్ద విద్యుత్‌క్షేత్రం యొక్క దిశ ఏది?




**Options :**

1. AB
2. CB
3. BD
4. AC

(A) AB
(B) CB
(C) BD
(D) AC

**Answer: (B)** CB · The council's preliminary key

## Q12 AP EAPCET 2026 · 14 May · Shift 2 MCQ

The electrical potential at a point 'A' in an electric field $300\ \mathrm{NC^{-1}}$ is $900\ \mathrm{V}$. Now find the work done in moving $1\ \mu\mathrm{C}$ charge from point 'A' to $10\mathrm{m}$ is

(A) $500 \times 10^{-6}$ J
(B) $600 \times 10^{-6}$ J
(C) $570 \times 10^{-6}$ J
(D) $630 \times 10^{-6}$ J

**Answer: (D)** $630 \times 10^{-6}$ J · The council's preliminary key

**Q13** AP EAPCET 2026 · 14 May · Shift 2 MCQ

Two point charges, $+2\ \mu C$ and $-2\ \mu C$, are fixed respectively at points A and B, separated by 4 m in air. A point P is located such that it is 3 m from $+2\ \mu C$ and 5 m from $-2\ \mu C$. What is the electric potential at point P? Take $k = 9 \times 10^9\ N\ m^2\ C^{-2}$

(A) $1.2 \times 10^3$ V
(B) $2.4 \times 10^3$ V
(C) $-3.6 \times 10^3$ V
(D) $3.6 \times 10^3$ V

**Answer: (B)** $2.4 \times 10^3$ V · The council's preliminary key

**Q14** AP EAPCET 2026 · 13 May · Shift 1 MCQ

Two identical balls each of mass $\frac{40}{3}g$ carry equal and opposite charge. They are suspended from a horizontal plate by silk threads each of length $1\ m$ with a separation of $1.5\ m$ between points of suspension. At equilibrium, if the distance between the balls is $30\ cm$ then, magnitude of charge on each ball is
(Acceleration due to gravity = $10\ ms^{-2}$)

(A) $10^{-6}\ C$
(B) $10^{-5}\ C$
(C) $10^{-4}\ C$
(D) $10^{-3}\ C$

**Answer: (A)** $10^{-6}\ C$ · The council's preliminary key

**Q15** AP EAPCET 2026 · 13 May · Shift 1 MCQ

A conducting sphere of radius 4cm is charged such that it has a potential of 5V on its surface. Then the potential at a point which is at a depth of 1cm from its surface is

(A) 2 V
(B) 3 V
(C) 4 V
(D) 5 V

**Answer: (D)** 5 V · The council's preliminary key

**Q16** AP EAPCET 2026 · 13 May · Shift 2 MCQ

Two point charges $Q$ and $-4Q$ are separated by a distance $r$. If electric field at the location of $Q$ is $\vec{E}$, then the field at the location of $-4Q$ is

(A) $\vec{E}$
(B) $-\vec{E}$
(C) $-\frac{\vec{E}}{4}$
(D) $\frac{\vec{E}}{4}$

**Answer: (D)** $\frac{\vec{E}}{4}$ · The council's preliminary key

**Q17** AP EAPCET 2026 · 13 May · Shift 2 MCQ

If two positive charges each of $20\ \mu\text{C}$ are placed at the two vertices of an equilateral triangle of side $50\ \text{cm}$ and a third positive charge of $10\sqrt{3}\ \mu\text{C}$ is placed at the centroid of the triangle, then the electrostatic potential energy of the system of three charges is

(A) $14.4\ \text{J}$
(B) $57.6\ \text{J}$
(C) $28.8\ \text{J}$
(D) $21.6\ \text{J}$

**Answer: (C)** $28.8\ \text{J}$ · The council's preliminary key

**Q18** AP EAPCET 2026 · 12 May · Shift 1 MCQ

A spherical rubber balloon has the electric charges uniformly distributed over its surface. If the balloon is inflated further, the electric intensity E on the surface

(A) increases
(B) decreases
(C) remains same
(D) is zero

**Answer: (B) decreases** · The council's preliminary key

**Q19** AP EAPCET 2026 · 12 May · Shift 1 MCQ

A charge '$Q$' is distributed on concentric hollow spheres of radii $r$ and $R$, $(R > r)$ such that their surface charge densities are same. The potential at their centre is

(A) $\frac{Q(R^2+r^2)}{4\pi\varepsilon_0(R+r)}$

(B) $\frac{QR}{4\pi\varepsilon_0(R+r)}$

(C) zero

(D) $\frac{Q(R+r)}{4\pi\varepsilon_0(R^2+r^2)}$

**Answer: (D)** $\frac{Q(R+r)}{4\pi\varepsilon_0(R^2+r^2)}$ · The council's preliminary key

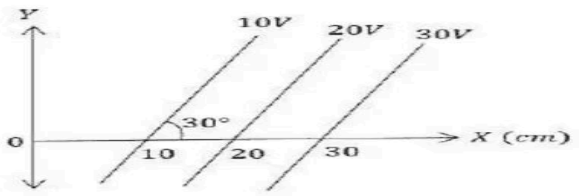
## Q20 AP EAPCET 2026 · 12 May · Shift 1 MCQ

The figure shows equipotential surfaces in a region. The electric field in the region is

*(see the figure above)*

The figure shows equipotential surfaces in a region. The electric field in the region is

ఒక ప్రాంతంలోని సమ పొటెన్షియల్ తలాలు పటములో చూపబడినవి. ఆ ప్రాంతంలో విద్యుత్ క్షేత్ర తీవ్రత




Options :

1. 100 $Vm^{-1}$ along X–axis
   X–అక్షం దిశలో 100 $Vm^{-1}$
2. 100 $Vm^{-1}$ along Y–axis
   Y– అక్షం దిశలో 100 $Vm^{-1}$
3. 200 $Vm^{-1}$ at an angle 120° with X–axis
   X–అక్షంతో 120° కోణం చేస్తూ 200 $Vm^{-1}$
4. 50 $Vm^{-1}$ at an angle 120° with X–axis
   X–అక్షంతో 120° కోణం చేస్తూ 50 $Vm^{-1}$

(A) 100 $Vm^{-1}$ along X–axis

(B) 100 $Vm^{-1}$ along Y–axis

(C) 200 $Vm^{-1}$ at an angle 120° with X–axis

(D) 50 $Vm^{-1}$ at an angle 120° with X–axis

**Answer: (C)** 200 $Vm^{-1}$ **at an angle** 120° **with X–axis** · The council's preliminary key

## Q21 AP EAPCET 2026 · 12 May · Shift 2 MCQ

Two point charges $-2Q$ and $Q$ are located at $(-3a, 0)$ and $(3a, 0)$ in the $X-Y$ plane. The locus of all points in the $X-Y$ plane where electric potential is zero to these charges is

(A) Straight line
(B) Ellipse
(C) Circle
(D) Parabola

**Answer: (C) Circle** · The council's preliminary key

**Q22** TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $\phi_A$ and $\phi_B$ are the electric fluxes leaving and entering a Gaussian surface respectively, then the charge enclosed in the surface is

(A) $(\phi_A - \phi_B)\varepsilon_o$
(B) $\frac{(\phi_A + \phi_B)}{\varepsilon_o}$
(C) $(\phi_A + \phi_B)\varepsilon_o$
(D) $\frac{(\phi_B - \phi_A)}{\varepsilon_o}$

**Answer: (A)** $(\phi_A - \phi_B)\varepsilon_o$ · The council's preliminary key

**Q23** TS EAPCET 2026 · 11 May · Shift 1 MCQ

The spheres A, B and C have radii R, R and 2R respectively. Initially A has a charge $-Q$, B is neutral and C is positively charged with a surface charge density equal to that of A. If the three spheres are placed in contact with each other and later separated, then the charges on the three spheres A, B and C respectively are

(A) $\frac{5Q}{4}, \frac{5Q}{4}, \frac{5Q}{2}$
(B) $Q, Q, Q$
(C) $\frac{6Q}{5}, \frac{6Q}{5}, \frac{3Q}{5}$
(D) $\frac{3Q}{4}, \frac{3Q}{4}, \frac{3Q}{2}$

**Answer: (D)** $\frac{3Q}{4}, \frac{3Q}{4}, \frac{3Q}{2}$ · The council's preliminary key

**Q24** TS EAPCET 2026 · 11 May · Shift 2 MCQ

A long charged cylinder of linear charge density $\lambda$ is surrounded by a hollow coaxial conducting cylinder. The magnitude of electric field in the space between the two cylinders at a distance R from the common axis of the cylinders is

(A) $\frac{\lambda}{4\pi\varepsilon_0 R}$
(B) 0
(C) $\frac{\lambda}{2\pi\varepsilon_0 R}$
(D) $\frac{\lambda}{\pi\varepsilon_0 R}$

**Answer: (C)** $\frac{\lambda}{2\pi\varepsilon_0 R}$ · The council's preliminary key

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**Q25** TS EAPCET 2026 · 10 May · Shift 1 MCQ

Two metallic spherical shells A and B of radii 3 cm and 4 cm are given electric charges 20 $\mu$C and 40 $\mu$ C respectively. If the shells are arranged concentrically, then the ratio of the surface charge densities on the outer surfaces of the shells A and B is

(A) $4:27$
(B) $4:3$
(C) $16:9$
(D) $16:27$

**Answer: (D)** $16:27$ · The council's preliminary key

**Q26** TS EAPCET 2026 · 10 May · Shift 2 MCQ

At a distance of 20 cm from the centre of a charged conducting sphere of radius 10 cm, the electric field due to the sphere is $9000\,\mathrm{NC}^{-1}$. If an electric charge of 3 μC is placed at a distance of 30 cm from the centre of the sphere, then the electrostatic force acting on the charge is

(A) 9 mN
(B) 12 mN
(C) 18 mN
(D) 24 mN

**Answer: (B)** 12 mN · The council's preliminary key

**Q27** TS EAPCET 2026 · 9 May · Shift 1 MCQ

In an isosceles right angled triangle ABC, the length of the two equal sides AB and AC is 10 cm. If three charges $+5\ \mu\mathrm{C}$, $+20\ \mu\mathrm{C}$ and $+20\ \mu\mathrm{C}$ are placed at the three vertices A, B and C of the triangle respectively, then the net electrostatic force acting on a particle of charge $+2\ \mu\mathrm{C}$ placed at the midpoint of the hypotenuse BC is

(A) 24 N
(B) 9 N
(C) 36 N
(D) 18 N

**Answer: (D)** 18 N · The council's preliminary key

**Q28** TS EAPCET 2026 · 9 May · Shift 2 MCQ

An electron is moving in a stable circular orbit of radius 0.1 m around a thin infinitely long positively charged straight wire. If orbital velocity of the electron around the wire is $4\times10^{7}\ \mathrm{ms}^{-1}$, then linear charge density of the wire is nearly

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(A) $4.5 \times 10^{-7}\ \mathrm{Cm}^{-1}$
(B) $9 \times 10^{-7}\ \mathrm{Cm}^{-1}$
(C) $5 \times 10^{-7}\ \mathrm{Cm}^{-1}$
(D) $2.5 \times 10^{-7}\ \mathrm{Cm}^{-1}$

**Answer: (C)** $5 \times 10^{-7}\ \mathrm{Cm}^{-1}$ · The council's preliminary key

**Q29** TS EAPCET 2026 · 9 May · Shift 2 MCQ

Two charges $+6\ \mu\mathrm{C}$ and $-3\ \mu\mathrm{C}$ are placed at points $(-2.7\ \mathrm{cm}, 0)$ and $(2.7\ \mathrm{cm}, 0)$ respectively in an external electric field of $1.8r^{-2} \times 10^{5}\ \mathrm{NC}^{-1}$, where 'r' is the distance of a charge from the origin. Then the net electrostatic energy of the system of the two charges is

(A) 63 J
(B) 17 J
(C) 23 J
(D) 3 J

**Answer: (B)** 17 J · The council's preliminary key

**Q30** AP EAPCET 2025 · 27 May · Shift 1 MCQ

If two particles A and B of charges $1.6 \times 10^{-19}\ \mathrm{C}$ and $3.2 \times 10^{-19}\ \mathrm{C}$ respectively are separated by a distance of 3 cm in air, then the magnitude of electrostatic force on particle A due to particle B is

(A) $5.12 \times 10^{-22}\ \mathrm{N}$
(B) $5.12 \times 10^{-32}\ \mathrm{N}$
(C) $5.12 \times 10^{-12}\ \mathrm{N}$
(D) $5.12 \times 10^{-25}\ \mathrm{N}$

**Answer: (D)** $5.12 \times 10^{-25}\ \mathrm{N}$ · The council's preliminary key

**Q31** AP EAPCET 2025 · 27 May · Shift 1 MCQ

If four charges $+12$ nC, $-20$ nC, $+32$ nC and $-15$ nC are arranged at the four vertices of a square of side $\sqrt{2}\,\mathrm{m}$, then the net electric potential at the centre of the square due to these four charges is

(A) 72 V
(B) 81 V
(C) 64 V
(D) 36 V

**Answer: (B)** 81 V · The council's preliminary key

**Q32** AP EAPCET 2025 · 26 May · Shift 1 MCQ

An electric dipole with dipole moment $2 \times 10^{-10}$ C m is aligned at an angle $30^{\circ}$ with the direction of uniform electric field of $10^{4}$ N $\mathrm{C}^{-1}$. The magnitude of the torque acting on the dipole is

(A) $10^{-6}$ N m
(B) $10^{-5}$ N m
(C) $10^{-4}$ N m
(D) $10^{-3}$ N m

**Answer: (A)** $10^{-6}$ N m · The council's preliminary key

**Q33** AP EAPCET 2025 · 26 May · Shift 1 MCQ

An electric charge $10^{-3}\ \mu\text{C}$ is placed at the origin of x-y plane. The potential difference between points A and B located at $(\sqrt{2}\,\text{m}, \sqrt{2}\,\text{m})$ and $(2\,\text{m}, 0\,\text{m})$ respectively is

(A) $4.5$ V
(B) $9$ V
(C) $0$ V
(D) $2$ V

**Answer: (C)** $0$ V · The council's preliminary key

**Q34** AP EAPCET 2025 · 26 May · Shift 2 MCQ

The force between two conducting spheres of same radius having charges $+8\ \mu\text{C}$ and $-4\ \mu\text{C}$ separated by some distance in air is F. If the spheres are connected by a conducting wire and after some time the wire is removed, then the magnitude of the force between the two conducting spheres is

(A) $F$
(B) $\frac{F}{2}$
(C) $\frac{F}{8}$
(D) $\frac{F}{4}$

**Answer: (C)** $\frac{F}{8}$ · The council's preliminary key

**Q35** AP EAPCET 2025 · 26 May · Shift 2 MCQ

In space the electric potential varies as $V = 20|\vec{r}|$ volt, where $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ is the position vector. Then electric field in (N $C^{-1}$) at the point (4 m, 3 m, −5 m) is

(A) $-\sqrt{2}\left(4\hat{i} + 3\hat{j} - 10\hat{k}\right)$
(B) $-\sqrt{2}\left(8\hat{i} + 6\hat{j} - 10\hat{k}\right)$
(C) $-\left(8\hat{i} + 6\hat{j} - 10\hat{k}\right)$
(D) $4\hat{i} + 3\hat{j} - 5\hat{k}$

**Answer: (B)** $-\sqrt{2}\left(8\hat{i} + 6\hat{j} - 10\hat{k}\right)$ · The council's preliminary key

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**Q36** AP EAPCET 2025 · 24 May · Shift 1 MCQ

The sum of two point positive charges separated by a distance of 1.5 m in air is 25 $\mu$C. If the electrostatic force between the two charges is 0.6 N, then the difference between the two charges is

(A) 5 $\mu$C
(B) 8 $\mu$C
(C) 3 $\mu$C
(D) 6 $\mu$C

**Answer: (A)** 5 $\mu$C · The council's preliminary key

**Q37** AP EAPCET 2025 · 23 May · Shift 1 MCQ

A particle of mass 0.2 g and charge 2 C is released from rest in a uniform electric field of $20\ \mathrm{N\ C^{-1}}$. The kinetic energy of the particle after moving a distance of 20 cm is

(A) 10 J
(B) 8 J
(C) 18 J
(D) 12 J

**Answer: (B)** 8 J · The council's preliminary key

**Q38** AP EAPCET 2025 · 23 May · Shift 2 MCQ

A solid of mass 1 kg has $6 \times 10^{24}$ atoms. If one electron is removed from every one atom of $0.005\%$ of the atoms, then the charge gained by the solid is

(A) +24 C
(B) +48 C
(C) +96 C
(D) +60 C

**Answer: (B)** +48 C · The council's preliminary key

**Q39** AP EAPCET 2025 · 22 May · Shift 1 MCQ

In a region, the electric field is given by $\vec{E} = \left(3\hat{i} + 5\hat{j} + 7\hat{k}\right)\ \mathrm{N\ C^{-1}}$. The electric flux through a surface of area $3\ \mathrm{m^2}$ in yz plane is (in SI units)

(A) 21
(B) 15
(C) 12
(D) 9

**Answer: (D)** 9 · The council's preliminary key

**Q40** AP EAPCET 2025 · 22 May · Shift 1 MCQ

The veloicty acquired by an electron at rest when subjected to a uniform electric field of potential difference 180 V is

(Mass of electron = $9 \times 10^{-31}$ kg and charge of electron = $1.6 \times 10^{-19}$ C)

(A) $400\ \text{km s}^{-1}$
(B) $4000\ \text{km s}^{-1}$
(C) $800\ \text{km s}^{-1}$
(D) $8000\ \text{km s}^{-1}$

**Answer: (D)** $8000\ \text{km s}^{-1}$ · The council's preliminary key

**Q41** AP EAPCET 2025 · 22 May · Shift 2 MCQ

Two charged conducting spheres of radii 5 cm and 10 cm have equal surface charge densities. If the electric field on the surface of the smaller sphere is E, then the electric field on the surface of the larger sphere is

(A) 2E
(B) 4E
(C) 0.5E
(D) E

**Answer: (D)** E · The council's preliminary key

**Q42** AP EAPCET 2025 · 22 May · Shift 2 MCQ

As shown in the figure, if the values of the electric potential at three points A, B and C in a uniform electric field ($\bar{E}$) are $V_A$, $V_B$, and $V_C$ respectively, then

*(see the figure above)*

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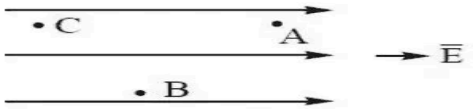
As shown in the figure, if the values of the electric potential at three points A, B and C in a uniform electric field $(\overline{E})$ are $V_A$, $V_B$, and $V_C$ respectively, then

పటంలో చూపిన విధంగా ఒక ఏకరీతి విద్యుత్ క్షేత్రం $(\overline{E})$ లో మూడు బిందువులు A, B మరియు C వద్ద విద్యుత్ పొటెన్షియల్ విలువలు వరుసగా $V_A$, $V_B$ మరియు $V_C$, అయితే




Options :

1. $V_A > V_B > V_C$
2. $V_A > V_C > V_B$
3. $V_C > V_B > V_A$
4. $V_C > V_A > V_B$

(A) $V_A > V_B > V_C$
(B) $V_A > V_C > V_B$
(C) $V_C > V_B > V_A$
(D) $V_C > V_A > V_B$

**Answer: (C)** $V_C > V_B > V_A$ · The council's preliminary key

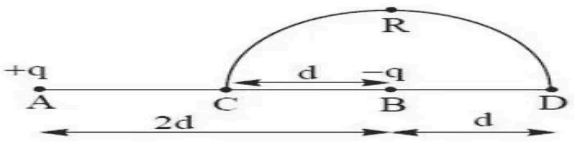
## Q43 AP EAPCET 2025 · 22 May · Shift 2 MCQ

As shown in the figure, the work done to move the charge 'Q' from point C to point D along the semi-circle CRD is

*(see the figure above)*

As shown in the figure, the work done to move the charge 'Q' from point C to point D along the semi-circle CRD is

పటంలో చూపిన విధంగా 'Q' ఆవేశాన్ని బిందువు C నుండి బిందువు D వద్దకు CRD అర్ధ వృత్తాకార మార్గంలో జరపడానికి చేయవలసిన పని




**Options :**

1. $\frac{qQ}{4\pi\varepsilon_0 d}$
2. $\frac{qQ}{2\pi\varepsilon_0 d}$
3. $\frac{-qQ}{6\pi\varepsilon_0 d}$
4. $\frac{-qQ}{4\pi\varepsilon_0 d}$

(A) $\frac{qQ}{4\pi\varepsilon_0 d}$
(B) $\frac{qQ}{2\pi\varepsilon_0 d}$
(C) $\frac{-qQ}{6\pi\varepsilon_0 d}$
(D) $\frac{-qQ}{4\pi\varepsilon_0 d}$

**Answer: (C)** $\frac{-qQ}{6\pi\varepsilon_0 d}$ · The council's preliminary key

## Q44 AP EAPCET 2025 · 21 May · Shift 1 MCQ

The force between two point charges kept with a separation of 9 cm in air is 98 N. If a dielectric slab of constant 4, thickness 6 cm and another dielectric slab of constant 9, thickness 3 cm are introduced between the two charges, then the new force becomes

(A) 18 N
(B) 36 N
(C) 49 N
(D) 84 N

**Answer: (A)** 18 N · The council's preliminary key

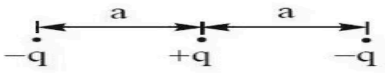
## Q45 AP EAPCET 2025 · 21 May · Shift 1 MCQ

Three point charges shown in the figure lie along a straight line. The energy required to exchange the position of central charge with one of the negative charges is

*(see the figure above)*

Three point charges shown in the figure lie along a straight line. The energy required to exchange the position of central charge with one of the negative charges is

పటంలో చూపిన విధంగా మూడు బిందు ఆవేశాలు ఒక సరళరేఖపై అమర్చబడినవి. వాటిలో మధ్యన గల ఆవేశాన్ని రెండింటిలో ఏదో ఒక ఋణావేశంతో మార్పిడి చేయడానికి అవసరమయ్యే శక్తి




Options :

1. $\frac{q^2}{8\pi\varepsilon_0 a}$
2. $\frac{3q^2}{8\pi\varepsilon_0 a}$
3. $\frac{q^2}{4\pi\varepsilon_0 a}$
4. $\frac{5q^2}{4\pi\varepsilon_0 a}$

(A) $\frac{q^2}{8\pi\varepsilon_0 a}$
(B) $\frac{3q^2}{8\pi\varepsilon_0 a}$
(C) $\frac{q^2}{4\pi\varepsilon_0 a}$
(D) $\frac{5q^2}{4\pi\varepsilon_0 a}$

**Answer: (C)** $\frac{q^2}{4\pi\varepsilon_0 a}$ · The council's preliminary key

## Q46 AP EAPCET 2025 · 21 May · Shift 2 MCQ

Three particles of each charge q are placed at the vertices of an equilateral triangle of side L. The work to be done to decrease the side of the triangle to $\frac{L}{2}$ is

(A) $\frac{1}{4\pi\varepsilon_0}\frac{q^2}{L}$
(B) $\frac{1}{4\pi\varepsilon_0}\frac{2q^2}{L}$
(C) $\frac{1}{4\pi\varepsilon_0}\frac{3q^2}{L}$
(D) $\frac{1}{4\pi\varepsilon_0}\frac{3q^2}{2L}$

**Answer: (C)** $\frac{1}{4\pi\varepsilon_0}\frac{3q^2}{L}$ · The council's preliminary key

## Q47 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If 27 charged water droplets, each of radius $10^{-3}$ m and charge $10^{-12}$ C coalesce to form a single big spherical drop, then the potential of the big drop is

(A) 9 V
(B) 27 V
(C) 39 V
(D) 81 V

**Answer: (D)** 81 V · The council's preliminary key

**Q48** TS EAPCET 2025 · 4 May · Shift 1 MCQ

The electric field due to an infinitely long thin straight wire with uniform linear charge density of $2.5 \times 10^{-7}\,\mathrm{C\,m^{-1}}$ at a radial distance of $x$ from the wire is $7.5 \times 10^{4}\,\mathrm{NC^{-1}}$. Then $x =$

(A) 2 cm
(B) 3 cm
(C) 4 cm
(D) 6 cm

**Answer: (D)** 6 cm · The council's preliminary key

**Q49** TS EAPCET 2025 · 4 May · Shift 2 MCQ

The electrostatic force between two charges kept in air is F. If 30% of the space between the charges is filled with a medium, then the electrostatic force between the charges becomes $\frac{F}{2.56}$. The dielectric constant of the medium is

(A) 8
(B) 3
(C) 9
(D) 4

**Answer: (C)** 9 · The council's preliminary key

**Q50** TS EAPCET 2025 · 4 May · Shift 2 MCQ

729 small identical spheres each charged to an electric potential 3V combine to form a bigger sphere. The electric potential of the bigger sphere is

(A) 9 V
(B) 729 V
(C) 81 V
(D) 243 V

**Answer: (D)** 243 V · The council's preliminary key

**Q51** TS EAPCET 2025 · 3 May · Shift 1 MCQ

Four electric charges $2\ \mu\mathrm{C}$, Q, $4\ \mu\mathrm{C}$ and $12\ \mu\mathrm{C}$ are placed on $x$-axis at distances $x = 0$, $1\ \mathrm{cm}$, $2\ \mathrm{cm}$ and $4\ \mathrm{cm}$ respectively. If the net force acting on the charge at origin is zero, then Q =

(A) $-3.5\ \mu C$
(B) $-1.75\ \mu C$
(C) $-2.75\ \mu C$
(D) $-5.5\ \mu C$

**Answer: (B)** $-1.75\ \mu C$ · The council's preliminary key

**Q52** TS EAPCET 2025 · 3 May · Shift 1 MCQ

If a particle of mass 10 mg and charge 2 $\mu$C at rest is subjected to a uniform electric field of potential difference 160 V, then the velocity acquired by the particle is

(A) $9\ ms^{-1}$
(B) $4\ ms^{-1}$
(C) $6\ ms^{-1}$
(D) $8\ ms^{-1}$

**Answer: (D)** $8\ ms^{-1}$ · The council's preliminary key

**Q53** TS EAPCET 2025 · 3 May · Shift 2 MCQ

An alpha particle and a proton are accelerated from rest in a uniform electric field. The ratio of the times taken by proton and alpha particle to attain equal displacements is

(A) $\sqrt{2}:1$
(B) $1:2$
(C) $1:\sqrt{2}$
(D) $2:1$

**Answer: (C)** $1:\sqrt{2}$ · The council's preliminary key

**Q54** TS EAPCET 2025 · 2 May · Shift 1 MCQ

A thin spherical shell of radius R and surface charge density $\sigma$ is placed in a cube of side 5R with their centers coinciding. The electric flux through one face of the cube is ($\varepsilon_0$ = Permittivity of free space)

(A) $\frac{2\pi R^2\sigma}{3\varepsilon_0}$
(B) $\frac{\pi R^2\sigma}{3\varepsilon_0}$
(C) $\frac{\sigma}{6\varepsilon_0}$
(D) $\frac{\sigma}{4\pi\varepsilon_0 R^2}$

**Answer: (A)** $\frac{2\pi R^2\sigma}{3\varepsilon_0}$ · The council's preliminary key

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**Q55** TS EAPCET 2025 · 2 May · Shift 2 MCQ

An electron and a positron enter a uniform electric field E perpendicular to it with equal speeds at the same time. The distance of separation between them in the direction of the field after a time 't' is

($\frac{e}{m}$ is specific charge of electron)

(A) $\frac{2Et^2e}{m}$
(B) $\frac{Eet^2}{m}$
(C) $\frac{Eet^2}{2m}$
(D) Zero

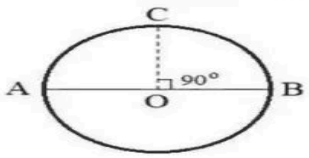
**Answer: (B)** $\frac{Eet^2}{m}$ · The council's preliminary key

**Q56** TS EAPCET 2025 · 2 May · Shift 2 MCQ

A charge q is placed at the centre 'O' of a circle of radius R and two other charges q and q are placed at the ends of the diameter AB of the circle. The work done to move the charge at point B along the circumference of the circle to a point C as shown in the figure is

*(see the figure above)*

A charge q is placed at the centre 'O' of a circle of radius R and two other charges q and q are placed at the ends of the diameter AB of the circle. The work done to move the charge at point B along the circumference of the circle to a point C as shown in the figure is
R వ్యాసార్ధం గల ఒక వృత్త కేంద్రం 'O' వద్ద ఒక ఆవేశం q ను మరియు వృత్తం వ్యాసం AB చివరల q మరియు q ఆవేశాలను ఉంచారు. పటంలో చూపిన విధంగా బిందువు B వద్ద గల ఆవేశాన్ని వృత్త పరిధి వెంబడి బిందువు C వద్దకు కదల్చుటకు చేయవలసిన పని




Options :

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1. $\frac{1}{4\pi\varepsilon_o}\cdot\frac{q^2}{R}(\sqrt{2})$
2. Zero (సున్నా)
3. $\frac{1}{4\pi\varepsilon_o}\cdot\frac{q^2}{R}\left(\frac{\sqrt{2}-1}{2}\right)$
4. $\frac{1}{4\pi\varepsilon_o}\cdot\frac{q^2}{R}\left(\frac{1}{\sqrt{2}}\right)$

(A) $\frac{1}{4\pi\varepsilon_o}\cdot\frac{q^2}{R}(\sqrt{2})$
(B) Zero
(C) $\frac{1}{4\pi\varepsilon_o}\cdot\frac{q^2}{R}\left(\frac{\sqrt{2}-1}{2}\right)$
(D) $\frac{1}{4\pi\varepsilon_o}\cdot\frac{q^2}{R}\left(\frac{1}{\sqrt{2}}\right)$

**Answer: (C)** $\frac{1}{4\pi\varepsilon_o}\cdot\frac{q^2}{R}\left(\frac{\sqrt{2}-1}{2}\right)$ · The council's preliminary key

**Q57** AP EAPCET 2024 · 23 May · Shift 1 MCQ

A particle of mass $0.5\ \mathrm{g}$ and charge $10\ \mu\mathrm{C}$ is subjected to a uniform electric field of $8\ \mathrm{NC}^{-1}$. If the particle is initially at rest, the velocity of the particle after a time of $5$ seconds is

(A) $5\ \mathrm{ms}^{-1}$
(B) $0.5\ \mathrm{ms}^{-1}$
(C) $8\ \mathrm{ms}^{-1}$
(D) $0.8\ \mathrm{ms}^{-1}$

**Answer: (D)** $0.8\ \mathrm{ms}^{-1}$ · The council's preliminary key

**Q58** AP EAPCET 2024 · 23 May · Shift 1 MCQ

125 identical charged small spheres coalesce to form a big charged sphere. If the electric potential on each small sphere is 60 mV, then the electric potential on the bigger sphere formed is

(A) 30 V
(B) 15 V
(C) 1.5 V
(D) 3 V

**Answer: (C)** 1.5 V · The council's preliminary key

**Q59** AP EAPCET 2024 · 23 May · Shift 1 MCQ

Two particles of charges $4\ \mathrm{nC}$ and $Q$ are kept in air with a separation of $10\ \mathrm{cm}$ between them. If the electrostatic potential energy of the system is $1.8\ \mu\mathrm{J}$, then $Q =$

(A) $12\ \mathrm{nC}$
(B) $9\ \mathrm{nC}$
(C) $5\ \mathrm{nC}$
(D) $7\ \mathrm{nC}$

**Answer: (C)** $5\ \mathrm{nC}$ · The council's preliminary key

**Q60** AP EAPCET 2024 · 22 May · Shift 1 MCQ

A neutral ammonia ($\mathrm{NH_3}$) in its vapour state has an electric dipole moment of magnitude $5 \times 10^{-30}$ C-m. How far apart are the molecules centres of positive and negative charge.

(A) $4.125 \times 10^{-12}$ m
(B) $3.125 \times 10^{-12}$ m
(C) $3.125 \times 10^{-6}$ m
(D) $4.125 \times 10^{-6}$ m

**Answer: (B)** $3.125 \times 10^{-12}$ m · The council's preliminary key

**Q61** AP EAPCET 2024 · 22 May · Shift 1 MCQ

If four charges $q_1 = +1 \times 10^{-8}$ C, $q_2 = -2 \times 10^{-8}$ C, $q_3 = +3 \times 10^{-8}$ C, and $q_4 = +2 \times 10^{-8}$ C are kept at the four corners of a square of side 1 m, then the electric potential at the centre of the square is

(A) 300 V
(B) 200 V
(C) 510 V
(D) 410 V

**Answer: (C)** 510 V · The council's preliminary key

**Q62** AP EAPCET 2024 · 22 May · Shift 2 MCQ

The magnitude of an electric field which can just suspend a deuteron of mass $3.2 \times 10^{-27}$ kg freely in air is

(A) $19.6 \times 10^{-8}\ \mathrm{NC}^{-1}$
(B) $196\ \mathrm{NC}^{-1}$
(C) $1.96 \times 10^{-10}\ \mathrm{NC}^{-1}$
(D) $0.196\ \mathrm{NC}^{-1}$

**Answer: (A)** $19.6 \times 10^{-8}\ \mathrm{NC}^{-1}$ · The council's preliminary key

**Q63** AP EAPCET 2024 · 22 May · Shift 2 MCQ

Two charges $5$ nC and $-2$ nC are placed at points $(5\ \mathrm{cm}, 0, 0)$ and $(23\ \mathrm{cm}, 0, 0)$ in a region of space where there is no other external field. The electrostatic potential energy of this charge system is

(A) $10 \times 10^{-7}$ J
(B) $5 \times 10^{-7}$ J
(C) $15 \times 10^{-7}$ J
(D) $25 \times 10^{-7}$ J

**Answer: (B)** $5 \times 10^{-7}$ J · The council's preliminary key

**Q64** AP EAPCET 2024 · 21 May · Shift 1 MCQ

A point charge ‘q’ coulomb is placed at the centre of a cube of side length ‘L’. Then the electric flux linked with each face of the cube is

(A) $\frac{q}{\epsilon_0}$
(B) $\frac{q}{L^2\epsilon_0}$
(C) $\frac{q}{6L^2\epsilon_0}$
(D) $\frac{q}{6\epsilon_0}$

**Answer: (D)** $\frac{q}{6\epsilon_0}$ · The council's preliminary key

## Q65 AP EAPCET 2024 · 21 May · Shift 1 MCQ

Three equal electric charges of each charge 'q' are placed at the vertices of an equilateral triangle of side of length 'L', then potential energy of the system is

(A) $\frac{1}{4\pi\epsilon_0} \cdot \frac{3q^2}{L}$
(B) $\frac{1}{4\pi\epsilon_0} \cdot \frac{q^2}{3L}$
(C) $\frac{1}{4\pi\epsilon_0} \cdot \frac{2q^2}{3L}$
(D) $\frac{1}{4\pi\epsilon_0} \cdot \frac{q^2}{L}$

**Answer: (A)** $\frac{1}{4\pi\epsilon_0} \cdot \frac{3q^2}{L}$ · The council's preliminary key

## Q66 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The electric field intensity (E) at a distance of 3 m from a uniform long straight wire of linear charge density 0.2 $\mu\mathrm{Cm}^{-1}$ is

(A) $1.2 \times 10^3\ \mathrm{Vm}^{-1}$
(B) $0.6 \times 10^3\ \mathrm{Vm}^{-1}$
(C) $1.8 \times 10^3\ \mathrm{Vm}^{-1}$
(D) $2.4 \times 10^3\ \mathrm{Vm}^{-1}$

**Answer: (A)** $1.2 \times 10^3\ \mathrm{Vm}^{-1}$ · The council's preliminary key

## Q67 AP EAPCET 2024 · 20 May · Shift 1 MCQ

Two spheres A & B of radii 4 cm & 6 cm are given charges of $80\ \mu\mathrm{C}$ & $40\ \mu\mathrm{C}$ respectively. If they are connected by a fine wire, the amount of charge flowing from one to the other is

(A) $32\ \mu\mathrm{C}$ from B to A
(B) $32\ \mu\mathrm{C}$ from A to B
(C) $20\ \mu\mathrm{C}$ from A to B
(D) $16\ \mu\mathrm{C}$ from B to A

**Answer: (B)** $32\ \mu\mathrm{C}$ from A to B · The council's preliminary key

## Q68 AP EAPCET 2024 · 20 May · Shift 1 MCQ

The angle between the electric dipole moment of a dipole and the electric field strength due to it on the equatorial line is

(A) $0^\circ$
(B) $90^\circ$
(C) $180^\circ$
(D) $270^\circ$

**Answer: (C)** $180^\circ$ · The council's preliminary key

**Q69** AP EAPCET 2024 · 20 May · Shift 2 MCQ

Three point charges $+q, +2q$ and $+4q$ are placed along a straight line such that the charge $+2q$ lies at equidistant from the other two charges. The ratio of the net electrostatic force on charges $+q$ and $+4q$ is

(A) $1:1$
(B) $1:2$
(C) $1:4$
(D) $1:3$

**Answer: (D)** $1:3$ · The council's preliminary key

**Q70** AP EAPCET 2024 · 20 May · Shift 2 MCQ

A particle of mass 2 g and charge $6\ \mu\text{C}$ is accelerated from rest through a potential difference of 60 V. The speed acquired by the particle is

(A) $0.6\ \text{ms}^{-1}$
(B) $1.2\ \text{ms}^{-1}$
(C) $1.8\ \text{ms}^{-1}$
(D) $0.3\ \text{ms}^{-1}$

**Answer: (A)** $0.6\ \text{ms}^{-1}$ · The council's preliminary key

**Q71** AP EAPCET 2024 · 19 May · Shift 2 MCQ

Two particles of equal mass 'm' and equal charge 'q' are separated by a distance of $16cm$. They do not experience any force. The value of $\frac{q}{m}$ is _____ (if 'G' is the universal gravitational constant and 'g' is the acceleration due to gravity).

(A) $\sqrt{4\pi\epsilon_0 G}$
(B) $\sqrt{\frac{G}{4\pi\epsilon_0}}$
(C) $\sqrt{\frac{\pi\epsilon_0}{G}}$
(D) $\sqrt{4\pi\epsilon_0 g}$

**Answer: (A)** $\sqrt{4\pi\epsilon_0 G}$ · The council's preliminary key

**Q72** AP EAPCET 2024 · 19 May · Shift 2 MCQ

In the following diagram, the work done in moving a point charge from point P to point A, B and C are $W_A, W_B$ and $W_C$ respectively. Then

(A, B, C are points on semicircle and point charge q is at the centre of semicircle)

*(see the figure above)*

In the following diagram, the work done in moving a point charge from point P to point A, B and C are $W_A, W_B$ and $W_C$ respectively. Then
(A, B, C are points on semicircle and point charge q is at the centre of semicircle)
ఒక బిందు ఆవేశాన్ని పటంలో చూపినట్లు P బిందువు నుండి A, B మరియు C బిందువుల వద్దకు తీసుకురావడంలో జరిగే పని వరుసగా $W_A, W_B$ మరియు $W_C$ అయితే (A, B, C లు అర్ధ వృత్తం పై బిందువులు మరియు అర్ధ వృత్తం మధ్య బిందువు వద్ద బిందు ఆవేశం q ఉన్నది)




Options :

1. $W_A = W_B = W_C \neq 0$
2. $W_A = W_B = W_C = 0$
3. $W_A > W_B > W_C$
4. $W_A < W_B < W_C$

(A) $W_A = W_B = W_C \neq 0$
(B) $W_A = W_B = W_C = 0$
(C) $W_A > W_B > W_C$
(D) $W_A < W_B < W_C$

**Answer: (A)** $W_A = W_B = W_C \neq 0$ · The council's preliminary key

**Q73** AP EAPCET 2024 · 18 May · Shift 1 MCQ

Two point charges $+6\ \mu\text{C}$ and $+10\ \mu\text{C}$ kept at certain distance repel each other with a force of $30\ \text{N}$. If each charge is given an additional charge of $-8\ \mu\text{C}$, the two charges

(A) Attract with a force of $2\text{N}$
(B) repel with a force of $2\text{N}$
(C) Attract with a force of $15\ \text{N}$
(D) repel with a force of $15\ \text{N}$

**Answer: (A)** Attract with a force of $2\text{N}$ · The council's preliminary key

**Q74** AP EAPCET 2024 · 18 May · Shift 1 MCQ

In a region, the electric field is $(30\bar{i} + 40\bar{j})\ \mathrm{NC}^{-1}$. If the electric potential at the origin is zero, the electric potential at the point $(1\ \mathrm{m}, 2\ \mathrm{m})$ is

(A) $-60\ \mathrm{V}$
(B) $-75\ \mathrm{V}$
(C) $-55\ \mathrm{V}$
(D) $-110\ \mathrm{V}$

**Answer: (D)** $-110\ \mathrm{V}$ · The council's preliminary key

**Q75** TS EAPCET 2024 · 11 May · Shift 1 MCQ

The electric flux due to an electric field $\vec{E} = (8\hat{i} + 13\hat{j})\ \mathrm{NC}^{-1}$ through an area $3\ \mathrm{m}^2$ lying in the XZ plane is

(A) 39 Wb
(B) 24 Wb
(C) 63 Wb
(D) 15 Wb

**Answer: (A)** 39 Wb · The council's preliminary key

**Q76** TS EAPCET 2024 · 10 May · Shift 1 MCQ

Two point charges $-10\ \mu\mathrm{C}$ and $+5\ \mu\mathrm{C}$ are situated on X-axis at $x = 0$ and $x = \sqrt{2}\ \mathrm{m}$. The point along the X-axis where the electric field becomes zero is

(A) $x = (\sqrt{2} - 1)\ \mathrm{m}$
(B) $x = 2(\sqrt{2} - 1)\ \mathrm{m}$
(C) $x = 2(\sqrt{2} + 1)\ \mathrm{m}$
(D) $x = (\sqrt{2} + 1)\ \mathrm{m}$

**Answer: (C)** $x = 2(\sqrt{2} + 1)\ \mathrm{m}$ · The council's preliminary key

**Q77** TS EAPCET 2024 · 10 May · Shift 2 MCQ

A proton and an '$\alpha$' particle are both accelerated from rest in a uniform electric field. The ratio of works done by the electric field on the proton and the $\alpha$-particle in a given time is

(A) $1 : 1$
(B) $1 : 2$
(C) $1 : 4$
(D) $4 : 1$

**Answer: (A)** $1 : 1$ · The council's preliminary key

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**Q78** TS EAPCET 2024 · 9 May · Shift 1 MCQ

Two positive point charges are separated by a distance of 4 m in air. If the sum of the two charges is $36\ \mu\text{C}$ and the electrostatic force between them is 0.18 N, then the bigger charge is

(A) $30\ \mu\text{C}$
(B) $18\ \mu\text{C}$
(C) $20\ \mu\text{C}$
(D) $16\ \mu\text{C}$

**Answer: (C)** $20\ \mu\text{C}$ · The council's preliminary key

**Q79** TS EAPCET 2024 · 9 May · Shift 2 MCQ

Two point charges of magnitudes $-8\ \mu\text{C}$ and $+32\ \mu\text{C}$ are separated by a distance of $15\ \text{cm}$ in air. The position of the point from $-8\ \mu\text{C}$ charge at which the resultant electric field becomes zero is

(A) $15\ \text{cm}$
(B) $30\ \text{cm}$
(C) $7.5\ \text{cm}$
(D) $5\ \text{cm}$

**Answer: (A)** $15\ \text{cm}$ · The council's preliminary key

**Q80** AP EAPCET 2023 · 19 May · Shift 1 MCQ

A uniformly charged conducting sphere of 2.4 m diameter has a surface charge density of $80.0\ \mu\text{C}\,\text{m}^{-2}$. The charge on the sphere is nearly

(A) $2.5 \times 10^{-3}\ \text{C}$
(B) $1.45 \times 10^{-3}\ \text{C}$
(C) $6.5 \times 10^{-3}\ \text{C}$
(D) $0.15 \times 10^{-3}\ \text{C}$

**Answer: (B)** $1.45 \times 10^{-3}\ \text{C}$ · The council's preliminary key

**Q81** AP EAPCET 2023 · 19 May · Shift 1 MCQ

Two charges +q and −q, each $1\ \mu\text{C}$ are arranged as shown in the figure. If x = 2 cm and y = 3 cm then potential difference $(V_A - V_B)$ is

*(see the figure above)*

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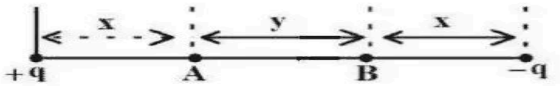
Two charges +q and −q, each 1 μC are arranged as shown in the figure. If x = 2 cm and y = 3 cm then potential difference $(V_A - V_B)$ is

ఒక్కొక్కటి 1 μC గల రెండు విద్యుదావేశాలు +q మరియు −q లను పటంలో చూపినట్లు ఉంచినారు. x = 2 cm మరియు y = 3 cm అయిన పొటెన్షియల్ తేడా $(V_A - V_B)$




**Options :**

1. $5.4 \times 10^2$ V
2. $5.4 \times 10^5$ V
3. $5.2 \times 10^2$ V
4. $2.7 \times 10^5$ V

(A) $5.4 \times 10^2$ V
(B) $5.4 \times 10^5$ V
(C) $5.2 \times 10^2$ V
(D) $2.7 \times 10^5$ V

**Answer: (B)** $5.4 \times 10^5$ V · The council's preliminary key

## Q82 AP EAPCET 2023 · 18 May · Shift 1 MCQ

Flux coming out from a unit positive charge kept in air is

(A) $\varepsilon_0$
(B) $(\varepsilon_0)^{-1}$
(C) $(4\pi\varepsilon_0)^{-1}$
(D) $4\pi\varepsilon_0$

**Answer: (B)** $(\varepsilon_0)^{-1}$ · The council's preliminary key

## Q83 AP EAPCET 2023 · 18 May · Shift 1 MCQ

Three point charges 1 C, 2 C and 3 C are placed at the corners of an equilateral triangle of side one metre. The work done to move these charges to the corners of another equilateral triangle of side 0.5 m is

(A) $199 \times 10^9$ J
(B) $19 \times 10^9$ J
(C) $99 \times 10^9$ J
(D) $29 \times 10^9$ J

**Answer: (C)** $99 \times 10^9$ J · The council's preliminary key

**Q84** AP EAPCET 2023 · 18 May · Shift 2 MCQ

Among the following the charge that does not exist on any type of charged body is

(A) $3.2 \times 10^{-19}$ C
(B) $6.4 \times 10^{-19}$ C
(C) $9.6 \times 10^{-20}$ C
(D) $9.6 \times 10^{-18}$ C

**Answer: (C)** $9.6 \times 10^{-20}$ C · The council's preliminary key

**Q85** AP EAPCET 2023 · 17 May · Shift 1 MCQ

Two charges Q and 4Q are separated by a distance of 6 cm. The distance of the point from 4Q at which net electric field is zero is

(A) 2 cm
(B) 6 cm
(C) 8 cm
(D) 4 cm

**Answer: (D)** 4 cm · The council's preliminary key

**Q86** AP EAPCET 2023 · 17 May · Shift 1 MCQ

Inside a charged hollow sphere, at any point the electric field (E) and potential (V) are

(A) V = 0 and E = 0
(B) V is constant and E = 0
(C) V = 0 and E is constant
(D) V is constant and E is constant

**Answer: (B)** V is constant and E = 0 · The council's preliminary key

**Q87** AP EAPCET 2023 · 17 May · Shift 2 MCQ

An electron of charge 'e' is moving round the nucleus of a hydrogen atom in a circular orbit of radius 'r'. The coulomb force $\vec{F}$ between the two is

(here $K = \frac{1}{4\pi\varepsilon_0}$)

(A) $-K\frac{e^2}{r^3}\hat{r}$

(B) $K\frac{e^2}{r^3}\vec{r}$

(C) $-K\frac{e^2}{r^3}\vec{r}$

(D) $K\frac{e^2}{r^2}\vec{r}$

**Answer: (C)** $-K\frac{e^2}{r^3}\vec{r}$ · The council's preliminary key

**Q88** AP EAPCET 2023 · 17 May · Shift 2 MCQ

The potential is varying with distance (x) as $V=\frac{1}{2}\left(y^2-4x\right)$ volt. The electric field at x = 1 m and y = 1 m is

(A) $2\hat{i}+\hat{j}\ \mathrm{Vm}^{-1}$

(B) $-2\hat{i}+\hat{j}\ \mathrm{Vm}^{-1}$

(C) $2\hat{i}-\hat{j}\ \mathrm{Vm}^{-1}$

(D) $-2\hat{i}+2\hat{j}\ \mathrm{Vm}^{-1}$

**Answer: (C)** $2\hat{i}-\hat{j}\ \mathrm{Vm}^{-1}$ · The council's preliminary key

**Q89** AP EAPCET 2023 · 16 May · Shift 1 MCQ

In a region, the intensity of an electric field is given by $\vec{E}=\left(2\hat{i}+3\hat{j}+\hat{k}\right)\ \mathrm{NC}^{-1}$. The electric flux through a surface of area $10\hat{i}\ \mathrm{m}^2$ in the region is

(A) $5\ \mathrm{Nm^2C^{-1}}$

(B) $10\ \mathrm{Nm^2C^{-1}}$

(C) $15\ \mathrm{Nm^2C^{-1}}$

(D) $20\ \mathrm{Nm^2C^{-1}}$

**Answer: (D)** $20\ \mathrm{Nm^2C^{-1}}$ · The council's preliminary key

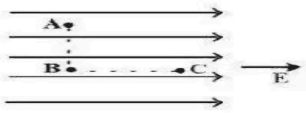
**Q90** AP EAPCET 2023 · 16 May · Shift 1 MCQ

The figure shows three points A, B and C in a uniform electric field ($\vec{E}$). The line AB is perpendicular to BC and BC is parallel to $\vec{E}$. If $V_A$, $V_B$ and $V_C$ are the potentials at A, B and C respectively, then the correct option is

*(see the figure above)*

The figure shows three points A, B and C in a uniform electric field ($\overline{E}$). The line AB is perpendicular to BC and BC is parallel to $\overline{E}$. If $V_A$, $V_B$ and $V_C$ are the potentials at A, B and C respectively, then the correct option is

ఏకరీతి విద్యుత్ క్షేత్రం ($\overline{E}$) లోని మూడు బిందువులు A, B మరియు C లు పటంలో చూపబడినవి. AB గీత BC కి లంబంగా మరియు BC గీత $\overline{E}$ కి సమాంతరంగా ఉన్నవి. A,B, C ల వద్ద విద్యుత్ పొటెన్షియల్ లు వరుసగా $V_A$, $V_B$, $V_C$ అయిన, క్రింది వాటిలో సరియైనది.




**Options :**

1. $V_A = V_B = V_C$
2. $V_A = V_B > V_C$
3. $V_A = V_B < V_C$
4. $V_A > V_B = V_C$

(A) $V_A = V_B = V_C$
(B) $V_A = V_B > V_C$
(C) $V_A = V_B < V_C$
(D) $V_A > V_B = V_C$

**Answer: (B)** $V_A = V_B > V_C$ · The council's preliminary key

## Q91 AP EAPCET 2023 · 16 May · Shift 2 MCQ

An infinite line charge produces a field of $9 \times 10^4\ \mathrm{NC}^{-1}$ at a distance of 2 cm. The linear charge density is

(A) $10^{-7}\ \mathrm{Cm}^{-1}$
(B) $1.5 \times 10^{-7}\ \mathrm{Cm}^{-1}$
(C) $10^{-8}\ \mathrm{Cm}^{-1}$
(D) $1.5 \times 10^{-8}\ \mathrm{Cm}^{-1}$

**Answer: (A)** $10^{-7}\ \mathrm{Cm}^{-1}$ · The council's preliminary key

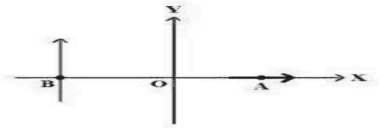
## Q92 AP EAPCET 2023 · 16 May · Shift 2 MCQ

Two electric dipoles, each of dipole moment 'P' are placed at points A (a,0) and B (-a,0) as shown in the figure. The work done in rotating both the dipoles through $90^\circ$ in clockwise direction is

(E = Electric field)

*(see the figure above)*

Two electric dipoles, each of dipole moment 'P' are placed at points A (a,0) and B (-a,0) as shown in the figure. The work done in rotating both the dipoles through 90° in clockwise direction is
(E = Electric field)
పటములో చూపినట్లు, P భ్రామకం గల రెండు విద్యుత్ ద్విధ్రువాలను వరుసగా A (a,0) మరియు B (-a,0) వద్ద ఉంచబడినవి. సవ్యదిశలో ఈ ద్విధ్రువ వ్యవస్థను 90° త్రిప్పుటకు చేయవలసిన పని.
(E = విద్యుత్ క్షేత్ర తీవ్రత)




Options :
1. PE
2. Zero
   సున్నా
3. 2PE
4. $\frac{PE}{2}$

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

**Answer: (B) Zero** · The council's preliminary key

## Q93 AP EAPCET 2023 · 15 May · Shift 1 MCQ

The electric field ($\vec{E}$ in $\mathrm{NC^{-1}}$) in a region is given by $\vec{E} = 3\hat{i} + 5\hat{i}$. The net electric flux through a square area of side 2 m parallel to y – z plane is

(A) $3\ \mathrm{NC^{-1}m^2}$
(B) $6\ \mathrm{NC^{-1}m^2}$
(C) $12\ \mathrm{NC^{-1}m^2}$
(D) $24\ \mathrm{NC^{-1}m^2}$

**Answer: (C)** $12\ \mathrm{NC^{-1}m^2}$ · The council's preliminary key

## Q94 AP EAPCET 2023 · 15 May · Shift 1 MCQ

Two thin conducting concentric shells of radii R and 2R are shown in the figure. The outer shell carries a charge +Q and the inner shell is neutral. Then the correct statement/s is

(a). When the switch is closed, the potential on the inner shell becomes zero

(b). With the switch closed, the charge on the inner sphere is $-\frac{Q}{2}$

*(see the figure above)*

Two thin conducting concentric shells of radii R and 2R are shown in the figure. The outer shell carries a charge +Q and the inner shell is neutral. Then the correct statement/s is

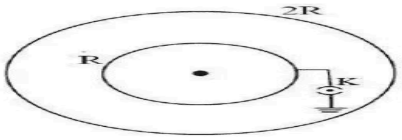
(a). When the switch is closed, the potential on the inner shell becomes zero

(b). With the switch closed, the charge on the inner sphere is $-\frac{Q}{2}$

వ్యాసార్థాలు R మరియు 2R లు గల రెండు పలుచని వాహక ఏక కేంద్ర గోళములు పటములో చూపబడినవి. బాహ్య గోళము పై +Q ఆవేశము గలదు మరియు అంతర గోళం తటస్థం. అయిన సరియైన ప్రవచనము/లు

(a). స్విచ్ ని మూసిన, అంతర గోళం యొక్క పొటెన్షియల్ శూన్యమగును.

(b). స్విచ్ ని మూసిన, అంతర గోళం పై విద్యుదావేశం, $-\frac{Q}{2}$ అగును.




Options :

1. (a) and (b) are correct
(a) మరియు (b) లు సరియైనవి

2. (a) is correct, (b) is wrong
(a) సరియైనది, (b) తప్పు

3. (a) is wrong, (b) is correct
(a) తప్పు, (b) సరియైనది

4. (a) and (b) are wrong
(a) మరియు (b) లు తప్పు

(A) (a) and (b) are correct

(B) (a) is correct, (b) is wrong

(C) (a) is wrong, (b) is correct

(D) (a) and (b) are wrong

**Answer: (A)** (a) and (b) are correct · The council's preliminary key

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**Q95** AP EAPCET 2023 · 15 May · Shift 2 MCQ

The net electric flux due to a uniform electric field of $3 \times 10^3 \hat{i}\ \mathrm{NC}^{-1}$ through a cube of side 20 cm oriented such that its faces are parallel to the coordinate planes is

(A) $30\ \mathrm{Nm^2C^{-1}}$

(B) $15\ \mathrm{Nm^2C^{-1}}$

(C) $0$

(D) $20\ \mathrm{Nm^2C^{-1}}$

**Answer: (C)** $0$ · The council's preliminary key

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**Q96** AP EAPCET 2023 · 15 May · Shift 2 MCQ

A block of mass ‘m’ and charge ‘q’ is connected to a point ‘O’ with an inextensible string. This system is on a horizontal table. An electric field (E) is applied perpendicular to the string and in the plane of the horizontal table. The tension in the string when it becomes parallel to the electric field is

(A) $qE$
(B) $2qE$
(C) $\frac{3qE}{4}$
(D) $3qE$

**Answer: (D)** $3qE$ · The council's preliminary key

**Q97** TS EAMCET 2023 · 14 May · Shift 1 MCQ

If the electric potential at a point on the surface of a hollow conducting sphere of radius R is V, then the electric potential at a point which is at distance $\frac{R}{3}$ from the centre of the sphere is

(A) $V$
(B) $\frac{V}{3}$
(C) $\frac{V}{9}$
(D) $3V$

**Answer: (A)** $V$ · The council's preliminary key

**Q98** TS EAMCET 2023 · 14 May · Shift 2 MCQ

A hollow spherical shell of radius r has a uniform charge density $\sigma$. It is kept in a cube of edge 3r such that the centres of the cube and the shell coincide. Then the electric flux coming out of one face of a cube is

($\varepsilon_0$ - permittivity of free space)

(A) $\frac{\pi r^2\sigma}{\varepsilon_0}$
(B) $\frac{5\varepsilon_0}{2\pi r^2\sigma}$
(C) $\frac{\pi r^2\sigma}{6\varepsilon_0}$
(D) $\frac{2\pi r^2\sigma}{3\varepsilon_0}$

**Answer: (D)** $\frac{2\pi r^2\sigma}{3\varepsilon_0}$ · The council's preliminary key

**Q99** TS EAMCET 2023 · 13 May · Shift 1 MCQ

The flux of the electric field $\vec{E} = 24\hat{i} + 30\hat{j} + 28\hat{k}\ \mathrm{NC}^{-1}$ through an area of $20\ \mathrm{m}^2$ on the $yz$ plane is

(A) $480\ \mathrm{Nm^2C^{-1}}$
(B) $600\ \mathrm{Nm^2C^{-1}}$
(C) $560\ \mathrm{Nm^2C^{-1}}$
(D) $1640\ \mathrm{Nm^2C^{-1}}$

**Answer: (A)** $480\ \mathrm{Nm^2C^{-1}}$ · The council's preliminary key

**Q100** TS EAMCET 2023 · 13 May · Shift 2 MCQ

Two conducting spheres of radii $r_1$ and $r_2$ are charged to the same surface charge density. The ratio of electric fields near their surfaces is

(A) $\frac{r_1^2}{r_2^2}$
(B) $\frac{r_2^2}{r_1^2}$
(C) $\frac{r_1}{r_2}$
(D) $1:1$

**Answer: (D)** $1:1$ · The council's preliminary key

**Q101** TS EAMCET 2023 · 13 May · Shift 2 MCQ

Two electric charges $+2\mu\text{C}$ and $-4\mu\text{C}$ are separated by a distance 3 m in air. At a point P located on the line joining the two charges and in between them, the electric potential is zero. Then the electric field at a point P (in $\text{NC}^{-1}$) is

(A) 9,000
(B) 18,000
(C) 12,000
(D) 27,000

**Answer: (D)** 27,000 · The council's preliminary key

**Q102** TS EAMCET 2023 · 12 May · Shift 1 MCQ

A clock dial has point charges $-q, -2q, -3q, \ldots\ldots\ldots - 12q$ at the positions of the corresponding numbers on the dial respectively. The time at which the hour's hand points the direction of the net electric field at the centre of the dial is
(Assume clock hands do not influence the net electric field)

(A) $8:30$
(B) $9:30$
(C) $10:30$
(D) $12:30$

**Answer: (B)** $9:30$ · The council's preliminary key

**Q103** TS EAMCET 2023 · 12 May · Shift 1 MCQ

The electric potential at a place is varying as $V = \frac{1}{2}\left(y^2 - 4x\right)$ volt. Then the electric field at x = 1 m and y = 1 m is

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(A) $2\hat{i}+\hat{j}\ \mathrm{Vm}^{-1}$
(B) $-2\hat{i}+\hat{j}\ \mathrm{Vm}^{-1}$
(C) $2\hat{i}-\hat{j}\ \mathrm{Vm}^{-1}$
(D) $-2\hat{i}+2\hat{j}\ \mathrm{Vm}^{-1}$

**Answer: (C)** $2\hat{i}-\hat{j}\ \mathrm{Vm}^{-1}$ · The council's preliminary key

## Q104 TS EAMCET 2023 · 12 May · Shift 2 MCQ

The electric field and electric potential at a point due to a point charge are $500\ \mathrm{NC}^{-1}$ and $30\ \mathrm{V}$ respectively, then the magnitude of the charge is

(A) $1.3\times10^{-9}\ \mathrm{C}$
(B) $3\times10^{-12}\ \mathrm{C}$
(C) $2\times10^{-10}\ \mathrm{C}$
(D) $1.6\times10^{-20}\ \mathrm{C}$

**Answer: (C)** $2\times10^{-10}\ \mathrm{C}$ · The council's preliminary key

## Q105 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

Two charges are $+10\,\mu C$ and $-10\,\mu C$ are separated by 10 cm. The magnitude of force acting on another charge $5\,\mu C$ placed at the midpoint of the line joining the two charges will be [Use $\frac{1}{4\pi\varepsilon_0}=9\times10^9$ in SI unit ]

(A) 360 N
(B) 0 N
(C) 320 N
(D) 380 N

**Answer: (A)** 360 N · The council's preliminary key

## Q106 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

A sphere '1' with radius R has charge q. Sphere '2' with radius 3R is far from sphere '1' and is initially uncharged. If the two spheres are now connected with a thin conducting wire, then the ratio $\frac{\sigma_1}{\sigma_2}$ of the surface charge densities is

(A) 2.0
(B) 2.5
(C) 3.0
(D) 9.0

**Answer: (C)** 3.0 · The council's preliminary key

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**Q107** TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

A small block of mass 5 g and charge $5\ \mu$C is placed on insulated, frictionless, inclined plane of angle $60^\circ$. An electric field is applied parallel to the inclined plane. If the block remains at rest then the magnitude of electric field is
(Take $g = 10\ \mathrm{m/s^2}$)

(A) $\frac{10^5}{\sqrt{3}}$ N/C
(B) $\frac{5}{\sqrt{3}} \times 10^4$ N/C
(C) $\sqrt{3} \times 10^4$ N/C
(D) $2 \times 10^4$ N/C

**Answer: (C)** $\sqrt{3} \times 10^4$ N/C · The council's preliminary key

**Q108** TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

Two metal spheres have their radii in the ratio of 4 : 7. They are put in contact and a charge $8.8 \times 10^{-7}\mathrm{C}$ is given to the system. Then they are separated so that each can exert no influence on the other. The potential due to the smaller sphere at 60 m from it in Volt is

(A) 85
(B) 76
(C) 48
(D) 66

**Answer: (C)** 48 · The council's preliminary key

**Q109** TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

Three charges are arranged on the vertices of a right angle triangle as shown in the figure. The magnitude of dipole moment of the combination in the unit of C-cm is
*(see the figure above)*

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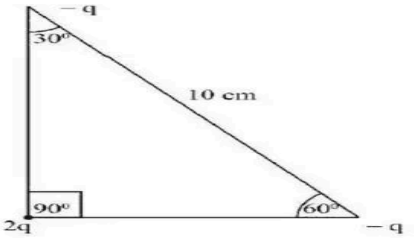
0
Correct Marks : 1 Wrong Marks : 0

Three charges are arranged on the vertices of a right angle triangle as shown in the figure. The magnitude of dipole moment of the combination in the unit of C-cm is




Options :

1. $10\sqrt{2}\,q$
2. $5\,q$
3. $10\sqrt{3}\,q$
4. $10\,q$

(A) $10\sqrt{2}\,\mathrm{q}$
(B) $5\,\mathrm{q}$
(C) $10\sqrt{3}\,\mathrm{q}$
(D) $10\,\mathrm{q}$

**Answer: (D)** $10\,\mathrm{q}$ · The council's preliminary key

## Q110 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

A particle of mass m and charge q travelling with a velocity $v$ along the x - axis enters a uniform electric field $\vec{E}$ directed along the y - axis. What will be the trajectory of the particle?

(A) Circular
(B) Elliptical
(C) Parabolic
(D) Helical

**Answer: (C) Parabolic** · The council's preliminary key

## Q111 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

$6\mu C$ charge is placed at the centre of a cube. What will be the electric flux at each face of the cube? $\left[\text{Take } \frac{1}{4\pi\epsilon_o} = 9 \times 10^9\ Nm^2C^{-2}\right]$

(A) $9\pi \times 10^2\ \mathrm{Nm^2/C}$
(B) $36\pi \times 10^3\ \mathrm{Nm^2/C}$
(C) $3.6\pi \times 10^3\ \mathrm{Nm^2/C}$
(D) $4\pi \times 10^3\ \mathrm{Nm^2/C}$

**Answer: (B)** $36\pi \times 10^3\ \mathrm{Nm^2/C}$ · The council's preliminary key

## Q112 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

There are two thin wire rings, each of radius R, whose axes coincide. The charges of the rings are q and − q. The magnitude of potential difference between the centres of the rings separated by a distance $\sqrt{3}\,R$ is

(A) 0
(B) $\frac{q}{4\pi\varepsilon_0 R}$
(C) $\frac{q}{4\pi\varepsilon_0 R}\ \frac{1}{\sqrt{3}R}$
(D) $\frac{q}{2\pi\varepsilon_0 R}$

**Answer: (B)** $\frac{q}{4\pi\varepsilon_0 R}$ · The council's preliminary key

## Q113 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

An electron is released from a distance of 4 m from a stationary point charge 20 nC. What will be the speed of the electron when it is 2 m away from the point charge?
[Charge of electron = $1.6 \times 10^{-19}$ C, mass of electron = $9 \times 10^{-31}$ kg, $\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9$ S.I unit ]

(A) $2 \times 10^6\ \mathrm{m/s}$
(B) $4 \times 10^6\ \mathrm{m/s}$
(C) $1.6 \times 10^6\ \mathrm{m/s}$
(D) $2.4 \times 10^6\ \mathrm{m/s}$

**Answer: (B)** $4 \times 10^6\ \mathrm{m/s}$ · The council's preliminary key

## Q114 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

A large metal plate has a surface charge density of $8.85 \times 10^{-6}$ C/m$^2$. An electron having initial kinetic energy of $8 \times 10^{-17} J$ is moving towards the center of the plate. If the electron stops just before reaching the plate then the initial distance between the electron and the plate is
[Take $\varepsilon_0 = 8.85 \times 10^{-12}$ C$^2$/Nm$^2$]

(A) 0.5 mm
(B) 0.1 mm
(C) 0.2 cm
(D) 0.02 cm

**Answer: (A)** 0.5 mm · The council's preliminary key

## Q115 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

A large charged plane having surface charge density $4.9 \times 10^{-6}\ \mathrm{C\,m^{-2}}$ lies in the x-y plane. A circular plane of radius of 1 cm is lying completely in the region where x, y and z coordinates are all positive. When the plane's normal makes an angle $60^\circ$ with the z-axis, the electric flux through the circular plane is

$\left(\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9\ \mathrm{Nm^2C^{-2}}\right)$

(A) $43.56\ \mathrm{N\,m^2\,C^{-1}}$

(B) $48.36\ \mathrm{N\,m^2\,C^{-1}}$

(C) $36.76\ \mathrm{N\,m^2\,C^{-1}}$

(D) $32.56\ \mathrm{N\,m^2\,C^{-1}}$

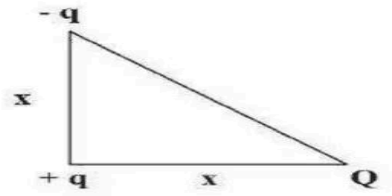
**Answer: (A)** $43.56\ \mathrm{N\,m^2\,C^{-1}}$ · The council's preliminary key

## Q116 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

In the figure, the value of Q so that the electrostatic potential energy of the system becomes zero is *(see the figure above)*

In the figure, the value of Q so that the electrostatic potential energy of the system becomes zero is

ఇచ్చిన పటంలో వ్యవస్థ యొక్క స్థిర విద్యుత్ స్థితిజ శక్తి శూన్యమగుటకు, విద్యుదావేశ Q విలువ




Options :

1. $\frac{q}{\sqrt{2}}$
2. $\frac{-2q}{2+\sqrt{2}}$
3. $\frac{2q}{2-\sqrt{2}}$
4. $\sqrt{2}\ q$

(A) $\frac{q}{\sqrt{2}}$

(B) $\frac{-2q}{2+\sqrt{2}}$

(C) $\frac{2q}{2-\sqrt{2}}$

(D) $\sqrt{2}\,q$

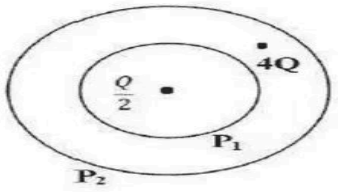
**Answer: (C)** $\frac{2q}{2-\sqrt{2}}$ · The council's preliminary key

## Q117 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

Two concentric spherical surfaces $P_1$ and $P_2$ enclose charges $\frac{Q}{2}$ and $4Q$ as shown in the figure. If $\phi_1$ and $\phi_2$ are the electric fluxes linked with the surfaces $P_1$ and $P_2$ respectively then
*(see the figure above)*

Two concentric spherical surfaces $P_1$ and $P_2$ enclose charges $\frac{Q}{2}$ and $4Q$ as shown in the figure. If $\phi_1$ and $\phi_2$ are the electric fluxes linked with the surfaces $P_1$ and $P_2$ respectively then

రెండు ఏక కేంద్ర గోళాకార తలాలు వరుసగా $\frac{Q}{2}$ మరియు $4Q$ ఆవేశాలను పటంలో చూపిన విధంగా ఆవరణం చేసి ఉన్నాయి. $P_1$ మరియు $P_2$ తలాలకు ముడిపడి ఉన్న విద్యుత్ అభివాహాలు వరుసగా $\phi_1$ మరియు $\phi_2$




Options :

1. $\phi_2 = 9\ \phi_1$
2. $\phi_1 = 9\ \phi_2$
3. $\phi_2 = 2\ \phi_1$
4. $\phi_1 = 2\ \phi_2$

(A) $\phi_2 = 9\,\phi_1$
(B) $\phi_1 = 9\,\phi_2$
(C) $\phi_2 = 2\,\phi_1$
(D) $\phi_1 = 2\,\phi_2$

**Answer: (A)** $\phi_2 = 9\,\phi_1$ · The council's preliminary key

## Q118 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

Three charges $+5q$, Q and $-2q$ are kept along a straight line in the same order such that, $+5q$ and $-2q$ charges are at a distance of $\frac{2r}{3}$ and $\frac{r}{3}$ from the charge Q respectively. If the net force on the charge $-2q$ is zero, then Q is

(A) $+\frac{5}{9}q$
(B) $-\frac{5}{9}q$
(C) $3q$
(D) $-3q$

**Answer: (B)** $-\frac{5}{9}q$ · The council's preliminary key

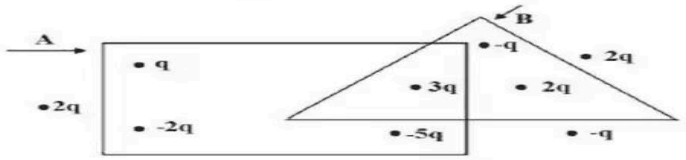
## Q119 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

The distribution of some charges on two Gaussian surfaces A and B are as shown in the figure. If $\phi_A$ and $\phi_B$ are electric fluxes linked with the surfaces A and B respectively, then $\frac{\phi_A}{\phi_B}$ =

*(see the figure above)*

The distribution of some charges on two Gaussian surfaces A and B are as shown in the figure. If $\phi_A$ and $\phi_B$ are electric fluxes linked with the surfaces A and B respectively, then $\frac{\phi_A}{\phi_B} =$

కొన్ని విద్యుదావేశాల అమరిక మరియు రెండు గాసియన్ తలాలు A మరియు B పటంలో చూపిన విధంగా ఉన్నాయి. A మరియు B తలాలతో ముడిపడి ఉన్న విద్యుత్ అభివాహాలు వరుసగా $\phi_A$ మరియు $\phi_B$ అయితే $\frac{\phi_A}{\phi_B} = =$




Options :

1. $-\frac{1}{5}$
2. -3
3. $-\frac{3}{2}$
4. $-\frac{3}{4}$

(A) $-\frac{1}{5}$
(B) $-3$
(C) $-\frac{3}{2}$
(D) $-\frac{3}{4}$

**Answer: (D)** $-\frac{3}{4}$ · The council's preliminary key

## Q120 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

A wire of length L has a charge Q distributed uniformly along its length. The wire is bent in the shape of a semicircle. The magnitude of the electric field at the centre of curvature of the semicircle is

(A) $\frac{1}{4\pi\varepsilon_o}\frac{Q}{L^2}$
(B) $\frac{1}{4\pi\varepsilon_o}\frac{Q^2}{L}$
(C) $\frac{Q}{2\varepsilon_o}\frac{1}{L^2}$
(D) $\frac{1}{2\pi\varepsilon_o}\frac{Q}{L^2}$

**Answer: (C)** $\frac{Q}{2\varepsilon_o}\frac{1}{L^2}$ · The council's preliminary key

## Q121 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

Let $V_1$ be the potential at the center of the square of side 1 m when the charges at the 4 corners are 2 C each. If the same charges are placed at the corners of a square of side 2 m, then the potential at the

center of this square is $V_2$. The value of $\frac{V_2}{V_1}$ is

(A) $\frac{1}{2}$
(B) $\frac{1}{\sqrt{2}}$
(C) $\frac{1}{2\sqrt{2}}$
(D) $\frac{1}{4\sqrt{2}}$

**Answer: (A)** $\frac{1}{2}$ · The council's preliminary key

## Q122 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

An infinite non-conducting sheet has a surface charge density of $7 \times 10^{-7}\ \mathrm{C\,m^{-2}}$ on one side. The distance between equipotential surfaces whose potentials differ by 19.8 V, will be
(Take $\frac{1}{4\pi\varepsilon_o} = 9 \times 10^9$ SI units)

(A) 2.0 mm
(B) 0.25 mm
(C) 1.0 mm
(D) 0.5 mm

**Answer: (D)** 0.5 mm · The council's preliminary key

## Q123 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

Four charges, each charge q coloumb are placed at points $(-1, 0, 0)$, $(1, 0, 0)$, $(0, -1, 0)$ and $(0, 1, 0)$ in the x y - plane. The distances along the axes are measured in meters. The magnitude of the electric field at the point z = 1 m on the z - axis is

(A) $\frac{1}{2\sqrt{2}}\frac{q}{\pi\varepsilon_o}\ \mathrm{Cm^{-2}}$
(B) $\frac{1}{4}\frac{q}{\pi\varepsilon_o}\ \mathrm{Cm^{-2}}$
(C) $\frac{q}{\pi\varepsilon_o}\ \mathrm{Cm^{-2}}$
(D) $\frac{q}{2\pi\varepsilon_o}\ \mathrm{Cm^{-2}}$

**Answer: (A)** $\frac{1}{2\sqrt{2}}\frac{q}{\pi\varepsilon_o}\ \mathrm{Cm^{-2}}$ · The council's preliminary key

## Q124 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

A large number of positive charges each of magnitude q are placed along the x-axis at the origin and at every 1 cm distance in both the directions. The electric flux through a spherical surface of radius 2.5 cm centered at the origin is

(A) $\frac{5q}{\varepsilon_0}$
(B) $\frac{8q}{\varepsilon_0}$
(C) $0$
(D) $\infty$

**Answer: (A)** $\frac{5q}{\varepsilon_0}$ · The council's preliminary key

## Q125 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

The electric field in a region of space is given as $\vec{E} = (5\ \mathrm{NC}^{-1})\, x\, \hat{i}$. Consider point A on the y-axis at $y = 5$ m and point B on the axis at $x = 2$ m. If the potentials at points A and B are $V_A$ and $V_B$ respectively, then $(V_B - V_A)$ is

(A) $-15\ \mathrm{V}$
(B) $8\ \mathrm{V}$
(C) $-10\ \mathrm{V}$
(D) $-12.5\ \mathrm{V}$

**Answer: (C)** $-10\ \mathrm{V}$ · The council's preliminary key

## Q126 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

A charge Q is to be divided between two objects. The values of the charges on the objects so that the electrostatic force between them will be maximum is

(A) $\frac{Q}{2}, \frac{Q}{2}$
(B) $\frac{Q}{3}, \frac{2}{3}Q$
(C) $\frac{Q}{4}, \frac{3}{4}Q$
(D) $\frac{Q}{5}, \frac{4}{5}Q$

**Answer: (A)** $\frac{Q}{2}, \frac{Q}{2}$ · The council's preliminary key

## Q127 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

In a space having electric field $\vec{E} = A(x\hat{i} + y\hat{j})$ the potential at a point (10 m, 20 m) is zero, then the potential at the origin is

$[A = 10\ \mathrm{Vm}^{-2}]$

(A) $500\ \mathrm{V}$
(B) $2000\ \mathrm{V}$
(C) $2500\ \mathrm{V}$
(D) $1500\ \mathrm{V}$

**Answer: (C)** $2500\ \mathrm{V}$ · The council's preliminary key

**Q128** AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

Electric potential due to a space is given by $\phi(x, y, z) = \phi_o \frac{x_o}{x}$; when $x_o = 5$ m and $\phi_o = 8$ V. Find the electric field at (10 m, 5 m, 5 m)

(A) $0.40\ \mathrm{Vm}^{-1}\ \hat{i}$
(B) $-0.40\ \mathrm{Vm}^{-1}\ \hat{i}$
(C) $4.0\ \mathrm{Vm}^{-1}\ \hat{i}$
(D) $-4.0\ \mathrm{Vm}^{-1}\ \hat{i}$

**Answer: (A)** $0.40\ \mathrm{Vm}^{-1}\ \hat{i}$ · The council's preliminary key

**Q129** AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

An electric dipole with dipole moment $5 \times 10^{-7}$ C m is in the electric field of $2 \times 10^{4}\ \mathrm{NC}^{-1}$ at an angle of 60° with the direction of the electric field. The torque acting on the dipole is

(A) $9 \times 10^{-3}$ Nm
(B) $1 \times 10^{-4}$ Nm
(C) $8.66 \times 10^{-3}$ Nm
(D) $2.88 \times 10^{-3}$ Nm

**Answer: (C)** $8.66 \times 10^{-3}$ Nm · The council's preliminary key

**Q130** AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

Two positive point charges of 10 $\mu$C and 12 $\mu$C are placed 10 cm apart in air. The work done to bring them 6 cm closer is

(A) 8.1 J
(B) 3.2 J
(C) 9 J
(D) 13.5 J

**Answer: (A)** 8.1 J · The council's preliminary key

**Q131** AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

A solid sphere of radius R carries a positive charge Q distributed uniformly throughout its volume. A very thin hole is drilled through it's center. A particle of mass m and charge $-q$ performs simple harmonic motion about the center of the sphere in this hole. The frequency of oscillation is

(A) $\frac{1}{2\pi}\left[\frac{Qq}{4\pi\varepsilon_o R^3 m}\right]^{\frac{1}{2}}$

(B) $\frac{1}{2\pi}\left[\frac{Qq}{4\pi\varepsilon_o R^2 m}\right]^{\frac{1}{2}}$

(C) $\frac{1}{2\pi}\frac{Q}{[4\pi\varepsilon_o mR^3]^{\frac{1}{2}}}$

(D) $\frac{1}{2\pi}\left[\frac{Qq}{4\pi\varepsilon_o mR}\right]^{\frac{1}{2}}$

**Answer: (A)** $\frac{1}{2\pi}\left[\frac{Qq}{4\pi\varepsilon_o R^3 m}\right]^{\frac{1}{2}}$ · The council's preliminary key

## Q132 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

Assertion (A): In a region of constant potential, the electric field is zero and there can be no charge inside the region.
Reason (R): According to Gauss law, charge inside the region should be zero if electric field is zero.

(A) Both (A) and (R) are true; (R) is correct explanation of (A)

(B) Both (A) and (R) are true; (R) is not correct explanation of (A)

(C) (A) is true, (R) is false

(D) (A) is false, (R) is true

**Options (2) or (1) were accepted. More than one answer was accepted.** · The council's preliminary key

## Q133 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

Statement (A): Inside a charged hollow metal sphere, E=0, V≠0. (E - electric field, V - electric potential)
Statement (B): The work done in moving a positive charge on an equipotential surface is zero.
Statement (C): When two like charges are brought closer, their mutual electrostatic potential energy will increase.

(A) A, B, C are true

(B) A, B are true, C is false

(C) A, C are true, B is false

(D) B, C are true, A is false

**Answer: (A)** A, B, C are true · The council's preliminary key

## Q134 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

A cube of side 'b' has a charge 'q' at each of its vertices. The electric field at the centre of the cube will be _____

(A) $\frac{q}{2b^2}$
(B) $\frac{q}{b^2}$
(C) $\frac{2q}{b^2}$
(D) $0$

**Answer: (D)** $0$ · The council's preliminary key

## Q135 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

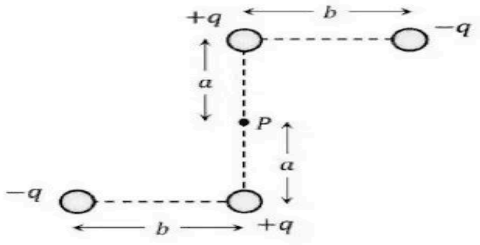
What is electro static potential due to charge configuration, at point $P$, shown in the figure? (given $b \ll a$ )

*(see the figure above)*

**Mandatory : No**

What is electro static potential due to charge configuration, at point $P$, shown in the figure? (given $b \ll a$ )

పటములో చూపిన విద్యుదావేశము ఆకృతి వల్ల బిందువు $P$ వద్ద విద్యుత్ పొటన్షియల్ ఎంత? ($b \ll a$ గా ఇవ్వబడింది)




**Options :**

1. $\frac{qb^2}{4\pi\varepsilon_0 a^3}$
2. $\frac{2qb^2}{4\pi\varepsilon_0 a^3}$
3. $\frac{2q}{4\pi\varepsilon_0 a}$
4. 0

(A) $\frac{qb^2}{4\pi\varepsilon_0 a^3}$
(B) $\frac{2qb^2}{4\pi\varepsilon_0 a^3}$
(C) $\frac{2q}{4\pi\varepsilon_0 a}$
(D) $0$

**Answer: (A)** $\frac{qb^2}{4\pi\varepsilon_0 a^3}$ · Checked by our team

## Q136 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Two insulated charged metallic spheres 'P' and 'Q' of negligible radii have their centres separated by a distance of $60\ \text{cm}$. The mutual force of electrostatic repulsion if the charge on each is $6 \times 10^{-7}\ \text{C}$ is

_____

(A) $9 \times 10^{-3}\ \mathrm{N}$
(B) $2.5 \times 10^{-9}\ \mathrm{N}$
(C) $5.2 \times 10^{-4}\ \mathrm{N}$
(D) $9 \times 10^{-9}\ \mathrm{N}$

**Answer: (A)** $9 \times 10^{-3}\ \mathrm{N}$ · The council's preliminary key

**Q137** AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Two charges $+80\,\mu\mathrm{C}$ and $+20\,\mu\mathrm{C}$ are separated by a distance in air. An unknown third charge $q$ is placed at the centre of the line joining the two charges. If the charges are in equilibrium, then $q$ = _____

(A) $-20\,\mu\mathrm{C}$
(B) $+20\,\mu\mathrm{C}$
(C) $-10\,\mu\mathrm{C}$
(D) $-40\,\mu\mathrm{C}$

**Answer: (A)** $-20\,\mu\mathrm{C}$ · The council's preliminary key

**Q138** AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

An electric dipole is placed in a non-uniform electric field. Then net:

(A) force experienced is zero while torque is not zero
(B) force experienced is zero and torque is also zero
(C) both force and torque are not zero
(D) force experienced is not zero while torque may be zero depending on its orientation

**Answer: (D) force experienced is not zero while torque may be zero depending on its orientation** · The council's preliminary key

**Q139** AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

A circular plate sheet of radius $10\ \mathrm{cm}$ is placed in a uniform electric field of $2\sqrt{3} \times 10^{5}\ \mathrm{N.C^{-1}}$, making an angle of $60^{\circ}$ with the field. Then find the electric flux through the sheet.

(A) $1.36 \times 10^{2}\ \mathrm{N.m^{2}.C^{-1}}$
(B) $9.42 \times 10^{3}\ \mathrm{N.m^{2}.C^{-1}}$
(C) $0.515 \times 10^{2}\ \mathrm{N.m^{2}.C^{-1}}$
(D) $0.515 \times 10^{4}\ \mathrm{N.m^{2}.C^{-1}}$

**Answer: (B)** $9.42 \times 10^{3}\ \mathrm{N.m^{2}.C^{-1}}$ · The council's preliminary key

**Q140** AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Four point-charges are placed at the vertices of a square of side $\sqrt{2}\ \mathrm{m}$ (about $1.41\ \mathrm{m}$) as shown in the figure. Find the electric potential at the centre of the square.

*(see the figure above)*

Mandatory : No

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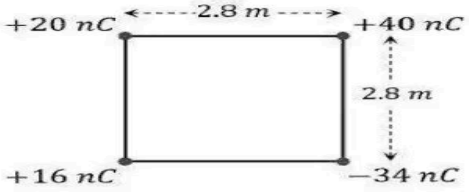
Four point-charges are placed at the vertices of a square of side 2.8 $m$ as shown in the figure. Find the electric potential at the centre of the square.

2.8 $m$ భుజము కలిగిన ఒక చతురస్రము యొక్క నాలుగు శీర్షాల వద్ద పటంలో చూపిన విధంగా బిందు ఆవేశాలు ఉంచబడినవి. అయిన, ఆ చతురస్ర కేంద్రము వద్ద విద్యుత్ పొటన్షియల్ ఎంత?




Options :
1. 450 V
2. 495 V
3. 405 V
4. 378 V

(A) 450 V
(B) 495 V
(C) 405 V
(D) 378 V

**Answer: (D)** 378 V · The council's preliminary key

## Q141 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

An 100 $eV$ electron is fired directly towards a large metal plate having surface charge density $-2 \times 10^{-6}\ cm^{-2}$. The distance from where the electron be projected so that it just fails to strike the plate is

_____

(A) 0.22 $mm$
(B) 0.44 $mm$
(C) 0.66 $mm$
(D) 0.88 $mm$

**Answer: (B)** 0.44 $mm$ · The council's preliminary key

## Q142 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

What is the direction of the lines of force at any point on the equipotential surface?

(A) Parallel to it
(B) Normal to it
(C) Be inclined
(D) Random direction

**Answer: (B) Normal to it** · The council's preliminary key

**Q143** AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

A unit positive charge has to be brought from infinity to a midpoint between two charges $20\ \mu C$ and $10\ \mu C$ separated by a distance of $50\ m$. How much work will be required?

(A) $10.8 \times 10^4\ J$
(B) $10.8 \times 10^3\ J$
(C) $1.08 \times 10^6\ J$
(D) $0.54 \times 10^5\ J$

**Answer: (B)** $10.8 \times 10^3\ J$ · The council's preliminary key

**Q144** AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Two opposite charges each of magnitude $500\ \mu c$ are $10\ cm$ apart. Find electric field intensity at a distance of $25\ cm$ from the midpoint on axial line of the dipole.

(A) $5.76 \times 10^7\ \mathrm{N.C^{-1}}$
(B) $9.28 \times 10^7\ \mathrm{N.C^{-1}}$
(C) $13.1 \times 10^{10}\ \mathrm{N.C^{-1}}$
(D) $20.5 \times 10^7\ \mathrm{N.C^{-1}}$

**Answer: (A)** $5.76 \times 10^7\ \mathrm{N.C^{-1}}$ · The council's preliminary key

**Q145** AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

The minimum work needed to be done to bring a charge $q = 6\ \mu C$ from $\infty$ to a point $0.75\ m$ from a charge $Q = 30\ \mu C$ is _____

(A) $4.16\ \mathrm{J}$
(B) $5.16\ \mathrm{J}$
(C) $2.16\ \mathrm{J}$
(D) $1.16\ \mathrm{J}$

**Answer: (C)** $2.16\ \mathrm{J}$ · The council's preliminary key

**Q146** AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Two electric dipoles of moments $p$ and $27p$ are placed in opposite direction on a line at a distance of $24\ cm$. The electric field will be zero at a point between the dipoles whose distance from the dipole of moment $p$ is

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(A) 6 $cm$

(B) 5 $cm$

(C) 10 $cm$

(D) $\frac{4}{13}$ $cm$

**Answer: (A)** 6 $cm$ · The council's preliminary key

## Q147 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

A uniform electric field of 500 $V.m^{-1}$ is directed at $30^\circ$ with the positive $x$-axis as shown in the figure. The potential difference $(V_B - V_A)$ if $OA = 3\ m$ and $OB = 5\ m$ is _____

*(see the figure above)*

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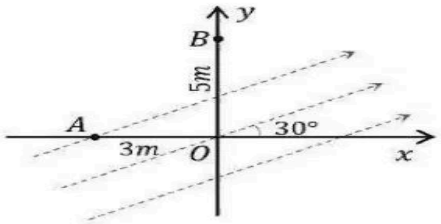
**Mandatory : No**

A uniform electric field of 500 $V.m^{-1}$ is directed at $30^\circ$ with the positive $x$-axis as shown in the figure. The potential difference $(V_B - V_A)$ if $OA = 3\ m$ and $OB = 5\ m$ is _____

500 $V.m^{-1}$ తీవ్రత కలిగిన ఒక ఏకరీతి విద్యుత్ క్షేత్రము ధనాత్మక-$x$ అక్షముతో పటములో చూపిన విధముగా $30^\circ$ కోణము చేస్తున్నది. $OA = 3\ m$ మరియు $OB = 5\ m$ అయితే $(V_B - V_A) =$ _____




**Options :**

1. $-250(3\sqrt{3}+5)\ V$
2. $250(3\sqrt{3}+5)\ V$
3. $-250(3+5\sqrt{3})\ V$
4. $250(3+5\sqrt{3})\ V$

(A) $-250(3\sqrt{3}+5)\ V$

(B) $250(3\sqrt{3}+5)\ V$

(C) $-250(3+5\sqrt{3})\ V$

(D) $250(3+5\sqrt{3})\ V$

**Answer: (A)** $-250(3\sqrt{3}+5)\ V$ · The council's preliminary key

## Q148 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

What is the electric flux for Gaussian surface A that encloses the charged particles in free space? [Given: $q_1 = -14\ \text{nC}$, $q_2 = 78.85\ \text{nC}$, $q_3 = -56\ \text{nC}$]

*(see the figure above)*

Mandatory : No

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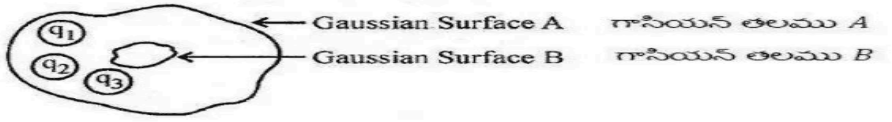
What is the electric flux for Gaussian surface $A$ that encloses the charged particles in free space? [Given: $q_1 = -14\ nC,\ q_2 = 78.85\ nC,\ q_3 = -56\ nC$]

ఖాళీ ప్రదేశములో ఆవేశిత కణములను ఆవరించి ఉన్న గాసియన్ తలము $A$ కలిగి ఉండే విద్యుత్ అభివాహము ఎంత? [$q_1 = -14\ nC,\ q_2 = 78.85\ nC,\ q_3 = -56\ nC$]




Options :

1. $10^3\ N.m^2.C^{-1}$
2. $10^3\ C.N^{-1}.m^{-2}$
3. $632 \times 10^3\ N.m^2.C^{-1}$
4. $632 \times 10^3\ C.N^{-1}.m^{-2}$

(A) $10^3\ \mathrm{N.m^2.C^{-1}}$
(B) $10^3\ \mathrm{C.N^{-1}.m^{-2}}$
(C) $632 \times 10^3\ \mathrm{N.m^2.C^{-1}}$
(D) $632 \times 10^3\ \mathrm{C.N^{-1}.m^{-2}}$

**Answer: (A)** $10^3\ \mathrm{N.m^2.C^{-1}}$ · The council's preliminary key

## Q149 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

Two charges $8\ \mu C$ each are placed at the corners A and B of an equilateral triangle of side $0.2\ \mathrm{m}$ in air. The electric potential at the third corner C is _____.

(A) $7.2 \times 10^5\ \mathrm{v}$
(B) $1.8 \times 10^5\ \mathrm{v}$
(C) $3.6 \times 10^5\ \mathrm{v}$
(D) $3.6 \times 10^4\ \mathrm{v}$

**Answer: (A)** $7.2 \times 10^5\ \mathrm{v}$ · The council's preliminary key

## Q150 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

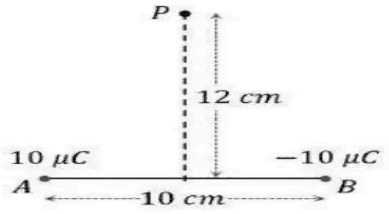
Two charges $10\ \mu\mathrm{C}$ and $-10\ \mu\mathrm{C}$ are placed at points $A$ and $B$ separated by a distance of $10\ \mathrm{cm}$. Find the electric field at a point 'P' on the perpendicular bisector of $AB$, at a distance of $12\ \mathrm{cm}$ from its mid-point.

*(see the figure above)*

**Mandatory : No**

Two charges $10\ \mu C$ and $-10\ \mu C$ are placed at points $A$ and $B$ separated by a distance of $10\ cm$. Find the electric field at a point '$P$' on the perpendicular bisector of $AB$, at a distance of $12\ cm$ from its mid-point.

రెండు ఆవేశాలు $10\ \mu C$ మరియు $-10\ \mu C$ లు $10\ cm$ దూరంలో $A$ మరియు $B$ బిందువుల వద్ద ఏరుచేయబడి ఉన్నాయి. $AB$ యొక్క మధ్య బిందువు నుండి $12\ cm$ దూరములో, దాని లంబ సమద్విఖండన రేఖపై '$P$' బిందువు వద్ద విద్యుత్‌క్షేత్రాన్ని కనుక్కోండి?




**Options :**

1. $16.4 \times 10^6\ N.C^{-1}$
2. $28.4 \times 10^6\ N.C^{-1}$
3. $8.2 \times 10^6\ N.C^{-1}$
4. $4.1 \times 10^6\ N.C^{-1}$

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(A) $16.4 \times 10^6\ \mathrm{N.C^{-1}}$
(B) $28.4 \times 10^6\ \mathrm{N.C^{-1}}$
(C) $8.2 \times 10^6\ \mathrm{N.C^{-1}}$
(D) $4.1 \times 10^6\ \mathrm{N.C^{-1}}$

**Answer: (D)** $4.1 \times 10^6\ \mathrm{N.C^{-1}}$ · The council's preliminary key

## Q151 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

When a number of charged liquid drops coalesce, which of the following quantity does not change?

(A) Charge
(B) Capacitance
(C) Electrostatic energy.
(D) Potential

**Answer: (A) Charge** · The council's preliminary key

## Q152 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

What is the angle between maximum value of potential gradient and equipotential surface?

(A) $0$
(B) $\frac{\pi}{4}$
(C) $\frac{\pi}{2}$
(D) $\pi$

**Answer: (C)** $\frac{\pi}{2}$ · The council's preliminary key

**Q153** AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Which statement(s) among the following are incorrect:
(i) A negative test charge experiences a force opposite to the direction of the field.
(ii) The tangent drawn to a line of force represents the direction of electric field.
(iii) The electric field lines never intersect.
(iv) The electric field lines form a closed loop.

(A) (i) only
(B) (ii) & (iii) only
(C) (iii) only
(D) (iv) only

**Answer: (D) (iv) only** · The council's preliminary key

**Q154** AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Gauss's law helps in:

(A) Determination of electric force between point charges
(B) Situation where Coulomb's law fails
(C) Determination of electric field due to symmetric charge distributions
(D) Determining electric potential due to symmetric charge distributions

**Answer: (C) Determination of electric field due to symmetric charge distributions** · The council's preliminary key

**Q155** AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Charge on the outer sphere is 'q' and the inner sphere is grounded. The charge on the inner sphere is $q'$, for $(r_2 > r_1)$. Then _____

(A) $q'r_1 = qr_2$
(B) $q' = q$
(C) $q' = \frac{r_1}{r_2}q$
(D) $q' = -\left(\frac{r_1}{r_2}\right)q$

**Answer: (D)** $q' = -\left(\frac{r_1}{r_2}\right)q$ · The council's preliminary key

**Q156** TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

A thin non - conducting ring of radius r has a linear charge density $\lambda = \lambda_0 \cos\phi$, where $\lambda_0$ is a constant and $\phi$ is the azimuthal angle. The magnitude of the electric field strength at the centre of the ring is:

(A) $\frac{1}{4\pi\varepsilon_0}\frac{\lambda_0}{r}$
(B) $\frac{1}{2\pi\varepsilon_0}\frac{\lambda_0}{r}$
(C) $\frac{\lambda_0}{4\varepsilon_0 r}$
(D) $\frac{\lambda_0}{2\varepsilon_0 r}$

**Answer: (C)** $\frac{\lambda_0}{4\varepsilon_0 r}$ · The council's preliminary key

## Q157 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

A circular wire-loop of radius $1\ \text{cm}$ carries a total charge $1\times10^{-6}\ \text{C}$ distributed uniformly over its length. If $0.01\,\%$ of its length (circumference) is cut-off, then the electric field at the centre of the loop due to the remaining wire is (Take $\frac{1}{4\pi\varepsilon_0}=9\times10^9$ SI unit)

(A) $3\times10^3\ \text{N/C}$
(B) $6\times10^3\ \text{N/C}$
(C) $9\times10^3\ \text{N/C}$
(D) $1.2\times10^2\ \text{N/C}$

**Answer: (C)** $9\times10^3\ \text{N/C}$ · The council's preliminary key

## Q158 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

A hollow metal sphere of radius $15\ \text{cm}$ is charged such that potential on its surface is $20\ \text{V}$. Then the potential at the centre of sphere is

(A) $0\ \text{V}$
(B) $20\ \text{V}$
(C) $10\ \text{V}$
(D) $15\ \text{V}$

**Answer: (B)** $20\ \text{V}$ · The council's preliminary key

## Q159 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

A semi-infinite non conducting rod lies along +x-axis with its left end at the origin. The rod has uniform linear charge density $\lambda$. The magnitude of electric field $|\vec{E}|$ at a point on the y-axis at the distance L from the origin, will be

*(see the figure above)*

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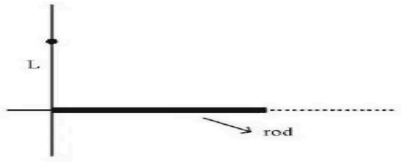
A semi-infinite non conducting rod lies along +x-axis with its left end at the origin. The rod has uniform linear charge density $\lambda$. The magnitude of electric field $|\vec{E}|$ at a point on the y-axis at the distance L from the origin, will be




Options :

1. $\frac{\lambda}{4\pi \in_0 L}$
2. $\frac{\lambda}{2\pi \in_0 L}$
3. $\frac{\lambda}{2\sqrt{2}\pi \in_0 L}$
4. $\frac{\sqrt{2}\lambda}{\pi \in_0 L}$

(A) $\frac{\lambda}{4\pi\epsilon_0 L}$
(B) $\frac{\lambda}{2\pi\epsilon_0 L}$
(C) $\frac{\lambda}{2\sqrt{2}\pi\epsilon_0 L}$
(D) $\frac{\sqrt{2}\lambda}{\pi\epsilon_0 L}$

**Answer: (C)** $\frac{\lambda}{2\sqrt{2}\pi\epsilon_0 L}$ · The council's preliminary key

## Q160 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

A particle of mass $m$ and charge $q$ is thrown perpendicular to an electric field of intensity $E$ with an initial velocity $v$. The particle moves a distance $x$ perpendicular to the field and a distance $y$ along the direction of the field. If $y = \alpha x^2$ then the $\alpha$ is given by

(A) $\frac{qE}{m}$
(B) $\frac{qEv^2}{m}$
(C) $\frac{2qE}{mv^2}$
(D) $\frac{qE}{2mv^2}$

**Answer: (D)** $\frac{qE}{2mv^2}$ · The council's preliminary key

## Q161 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

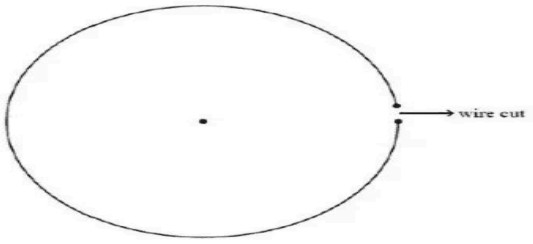
A circular wire loop of radius 10 cm carries a total charge of $10^{-5}$ C distributed uniformly over its length. A small length of $3.14 \times 10^{-6}$ m of wire is cut off. The magnitude of electric field at the center due to the remaining wire is

(Assume $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9$ SI units)

*(see the figure above)*

A circular wire loop of radius 10 cm carries a total charge of $10^{-5}$ C distributed uniformly over its length. A small length of $3.14\times10^{-6}$ m of wire is cut off. The magnitude of electric field at the center due to the remaining wire is

(Assume $\frac{1}{4\pi\epsilon_0}=9\times10^9$ SI units )




Options :

1. 30 N/C
2. 40 N/C
3. 35 N/C
4. 45 N/C

(A) 30 N/C
(B) 40 N/C
(C) 35 N/C
(D) 45 N/C

**Answer: (D)** 45 N/C · The council's preliminary key

## Q162 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

Two infinitely long thin straight wires having uniform linear charge densities $2\lambda$ and $3\lambda$ are arranged parallel to each other at a distance R apart. The intensity at a point midway between them is

(A) $\frac{\lambda}{2\pi\epsilon_0 R}$
(B) $\frac{\lambda}{\pi\epsilon_0 R}$
(C) $\frac{5\lambda}{\pi\epsilon_0 R}$
(D) $\frac{2\lambda}{3\pi\epsilon_0 R}$

**Answer: (B)** $\frac{\lambda}{\pi\epsilon_0 R}$ · The council's preliminary key

## Q163 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

If a charged spherical conductor of radius $10\ cm$ has potential $V$ at a point distant $5\ cm$ from its centre, then the potential at a point distant $15\ cm$ from the centre will be _____

(A) $\frac{1}{3}V$
(B) $\frac{2}{3}V$
(C) $\frac{3}{2}V$
(D) $3\,V$

**Answer: (B)** $\frac{2}{3}V$ · The council's preliminary key

## Q164 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

A point charge of $10^{-7}\ C$ is situated at the centre of cube of $1\ m$ side. The electric flux through its surface is _____

(A) $113 \times 10^4\ N.m^2.C^{-1}$
(B) $11.3 \times 10^4\ N.m^2.C^{-1}$
(C) $1.13 \times 10^4\ N.m^2.C^{-1}$
(D) $0.113 \times 10^4\ N.m^2.C^{-1}$

**Answer: (C)** $1.13 \times 10^4\ N.m^2.C^{-1}$ · The council's preliminary key

## Q165 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

An imaginary equilateral triangle $ABC$ of side length $2\ \mathrm{m}$ is placed in a uniform electric field $\vec{E} = 10\ \mathrm{N.C^{-1}}$ as shown. Then, $V_A - V_B =$

*(see the figure above)*

Orientation : Vertical

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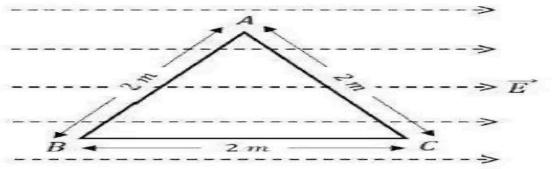
An imaginary equilateral triangle $ABC$ of side length $2\ m$ is placed in a uniform electric field $\vec{E} = 10\ N.C^{-1}$ as shown. Then, $V_A - V_B =$

$A, B, C$ బిందువులతో, $2m$ పొడవున్న భుజాలతో ఏర్పడే ఒక ఉపాత్మక సమబాహు త్రిభుజమును $\vec{E} = 10\ N.C^{-1}$ గల ఒక ఏకరీతి విద్యుత్ క్షేత్రములో, క్రింది పటములో చూపిన విధముగా ఏర్పరిస్తే, $V_A - V_B =$




Options :
1. $-5\ V$
2. $+5\ V$
3. $-10\ V$
4. $+10\ V$

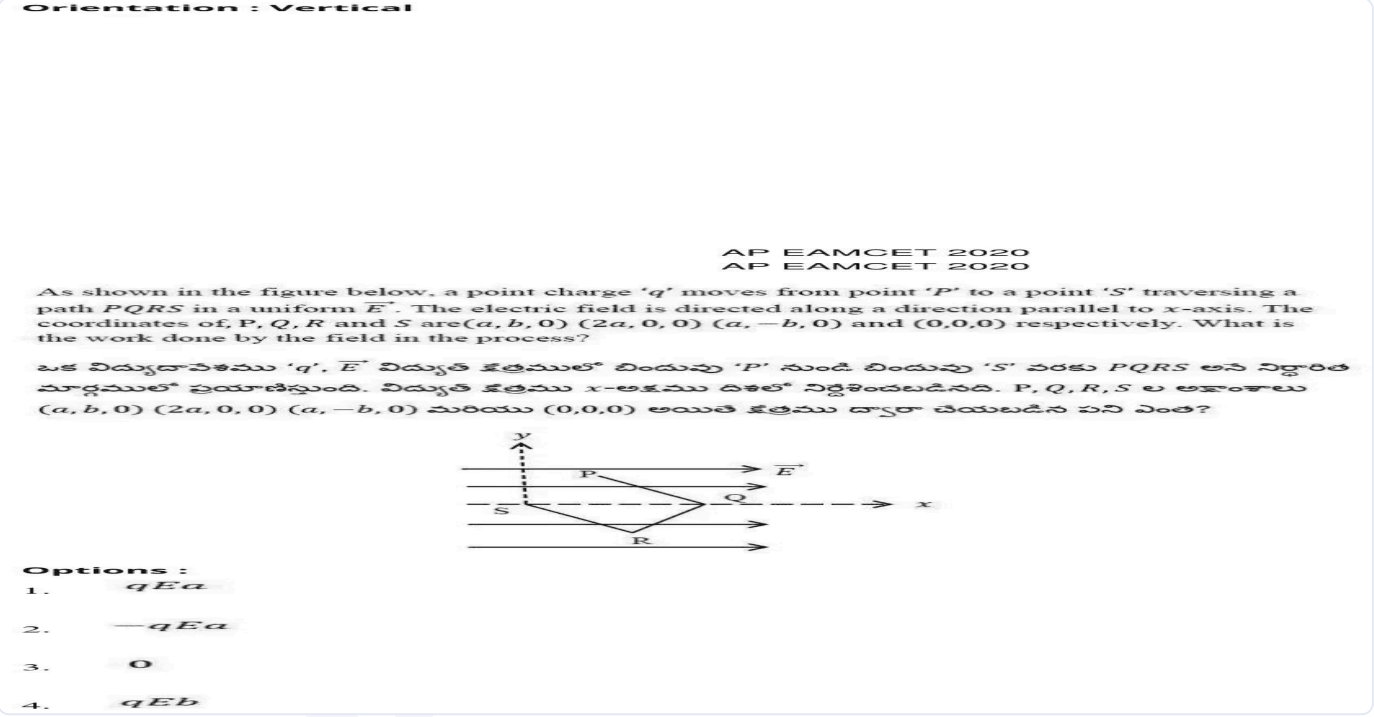
(A) $-5$ V
(B) $+5$ V
(C) $-10$ V
(D) $+10$ V

**Answer: (C)** $-10$ V · The council's preliminary key

## Q166 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

As shown in the figure below, a point charge 'q' moves from point 'P' to a point 'S' traversing a path $PQRS$ in a uniform $\vec{E}$. The electric field is directed along a direction parallel to $x$-axis. The coordinates of, $P, Q, R$ and $S$ are $(a, b, 0)$ $(2a, 0, 0)$ $(a, -b, 0)$ and $(0, 0, 0)$ respectively. What is the work done by the field in the process?

*(see the figure above)*




(A) $qEa$
(B) $-qEa$
(C) $0$
(D) $qEb$

**Answer: (B)** $-qEa$ · The council's preliminary key

## Q167 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

The number of electric lines that emerge from a finite charge $+q$ is _____

(A) infinite
(B) any finite number but not equal to zero
(C) proportional to the charge
(D) zero

**Answer: (C) proportional to the charge** · The council's preliminary key

**Q168** AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

When a $5\ \mathrm{C}$ charge is kept in a uniform electric field, a force of $5000\ \mathrm{N}$ acts on it. Find the potential difference between two points in that field, separated by a distance of $1\mathrm{cm}$.

(A) $10\ \mathrm{V}$
(B) $250\ \mathrm{V}$
(C) $1000\ \mathrm{V}$
(D) $2500\ \mathrm{V}$

**Answer: (A)** $10\ \mathrm{V}$ · The council's preliminary key

**Q169** AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

A dipole is placed in a uniform electric field, its potential energy will be minimum when the angle between its axis and field is

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

**Answer: (A) Zero** · The council's preliminary key

**Q170** AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

The electric potential at the surface of an atomic nucleus ($Z = 50$) of radius $9 \times 10^{-15}\ \mathrm{m}$ is

(A) $4 \times 10^{6}\ \mathrm{V}$
(B) $8 \times 10^{6}\ \mathrm{V}$
(C) $4 \times 10^{-6}\ \mathrm{V}$
(D) $8 \times 10^{-6}\ \mathrm{V}$

**Answer: (B)** $8 \times 10^{6}\ \mathrm{V}$ · The council's preliminary key

**Q171** AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

An infinite line charge produces a field of $9 \times 10^{4}\ \mathrm{N.C^{-1}}$ at a distance of 2 $\mathrm{cm}$. its linear charge density is _____

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(A) 0.1 $\mu C.m^{-1}$
(B) 0.2 $\mu C.m^{-1}$
(C) 10 $\mu C.m^{-1}$
(D) 20 $\mu C.m^{-1}$

**Answer: (A)** 0.1 $\mu C.m^{-1}$ · The council's preliminary key

**Q172** AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

When a charge of 20 C is taken from one point to another separated by a distance of 0.2 $m$, work of 2 J is required to be done. What is the potential difference between the two points?

(A) $2 \times 10^{-2}$ V
(B) $4 \times 10^{-4}$ V
(C) 8 V
(D) 0.1 V

**Answer: (D)** 0.1 V · The council's preliminary key

**Q173** AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

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

**Answer: (B)** $\propto r^{-2}$ · The council's preliminary key

**Q174** AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

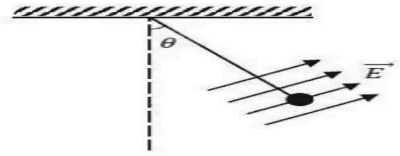
A charged cork ball having mass 1 g and charge 'q' is suspended on a light string in a uniform electric field as shown in figure. The ball is in equilibrium at $\theta = 37^\circ$, when value of electric field is $\vec{E} = (3\hat{i} + 5\hat{j}) \times 10^5$ N.C$^{-1}$. Assume $T$ as tension in the string. Which of the following options are correct? (given $\sin 37^\circ = 0.60$ and $g = 10$ ms$^{-2}$)

*(see the figure above)*

**Orientation : Vertical**

A charged cork ball having mass 1 $g$ and charge '$q$' is suspended on a light string in a uniform electric field as shown in figure. The ball is in equilibrium at $\theta = 37°$, when value of electric field is $\vec{E} = (3\,\vec{i} + 5\vec{j}) \times 10^5\ N.C^{-1}$. Assume $T$ as tension in the string. Which of the following options are correct? (given $\sin 37^0 = 0.60$ and $g = 10ms^{-2}$)

1 $g$ ద్రవరాశి, '$q$' ఆవేశము గల ఒక కార్క్ బంతి పటము చూపిన విధముగా ఒక ఏకరీతి విద్యుత్ క్షేత్రములో సన్నని తాడు ద్వారా వ్రేలాడదీయబడినది. విద్యుత్ క్షేత్ర విలువ $\vec{E} = (3\,\vec{i} + 5\vec{j}) \times 10^5\ N.C^{-1}$ ఉన్నప్పుడు, $\theta = 37°$ వద్ద బంతి నిశ్చల స్థితి లో ఉన్నది. తాడులో తన్యత $T$ అయితే క్రిందివానిలో సరి అయినది ఏది? ($\sin 37^0 = 0.60$ మరియు $g = 10ms^{-2}$)




**Options :**

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1. $q = 11 \times 10^{-8}\ C$
2. $T = 5.55 \times 10^{-3}\ N$
3. $q = 12 \times 10^{-9}\ C$
4. $T = 4.55 \times 10^{-3}\ N$

(A) $q = 11 \times 10^{-8}$ C

(B) $T = 5.55 \times 10^{-3}$ N

(C) $q = 12 \times 10^{-9}$ C

(D) $T = 4.55 \times 10^{-3}$ N

**Answer: (B)** $T = 5.55 \times 10^{-3}$ N · The council's preliminary key

## Q175 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

An electric dipole with dipole moment 'p' is placed with its axis at $30°$ to a uniform electric field. The work done in rotating the dipole to a position where its axis is perpendicular to the field is

(A) $2pE$

(B) $\frac{2pE}{\sqrt{3}}$

(C) $\frac{\sqrt{3}\,pE}{2}$

(D) $0$

**Answer: (C)** $\frac{\sqrt{3}\,pE}{2}$ · The council's preliminary key

## Q176 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Electric lines of force in the field of a positive point charge are _____

(A) radially outward
(B) radially inward
(C) parallel
(D) converged

**Answer: (A) radially outward** · The council's preliminary key

**Q177** AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Electric potential at a point distant $0.5\,\mathrm{m}$ from a spherical conductor of radius $0.2\,\mathrm{m}$ charged to $+1\,nC$ is

(A) $+9\,V$
(B) $-9\,V$
(C) $+18\,V$
(D) $-18\,V$

**Answer: (C)** $+18\,V$ · The council's preliminary key

**Q178** AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Three charges $4q, Q$ and $q$ are placed at positions $0, l/2$ and $l$ respectively along a straight line. If the resultant force on $q$ is zero, then $Q$ is equal to _____

(A) $-q$
(B) $-2q$
(C) $-q/2$
(D) $4qt$ (sic)

**Answer: (A)** $-q$ · The council's preliminary key

**Q179** AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

The electric potential on the surface of a charged spherical conductor of radius $5\ \mathrm{cm}$ is $200\ \mathrm{V}$. Work done in moving a charge of $+5\ \mathrm{C}$ from a point $A$ to another point $B$ situated at distances of $15\ \mathrm{cm}$ and $10\ \mathrm{cm}$ respectively from the centre of the sphere is _____

(A) $16.7\ \mathrm{J}$
(B) $22.3\ \mathrm{J}$
(C) $88.8\ \mathrm{J}$
(D) $166.7\ \mathrm{J}$

**Answer: (D)** $166.7\ \mathrm{J}$ · The council's preliminary key

**Q180** AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

Two opposite and equal charges each of magnitude $4 \times 10^{-8}\ C$ form a dipole. Their separation is $2 \times 10^{-2}\ cm$. When this dipole is placed in an external electric field $4 \times 10^{8}\ N.C^{-1}$, the value of maximum

torque and the work done in rotating it through $180^\circ$ respectively, will be

(A) $64 \times 10^{-4}$ N.m & $64 \times 10^{-4}$ J
(B) $32 \times 10^{-4}$ N.m & $32 \times 10^{-4}$ J
(C) $64 \times 10^{-4}$ N.m & $32 \times 10^{-4}$ J
(D) $32 \times 10^{-4}$ N.m & $64 \times 10^{-4}$ J

**Answer: (D)** $32 \times 10^{-4}$ N.m & $64 \times 10^{-4}$ J · The council's preliminary key

## Q181 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

Five point charges $^{1}/_{\pi}, ^{2}/_{\pi}, ^{3}/_{\pi}, ^{4}/_{\pi}$ and $^{-5}/_{\pi}$ nano-Coulomb are located inside a pyramid. The total electric flux through the surface of the pyramid is

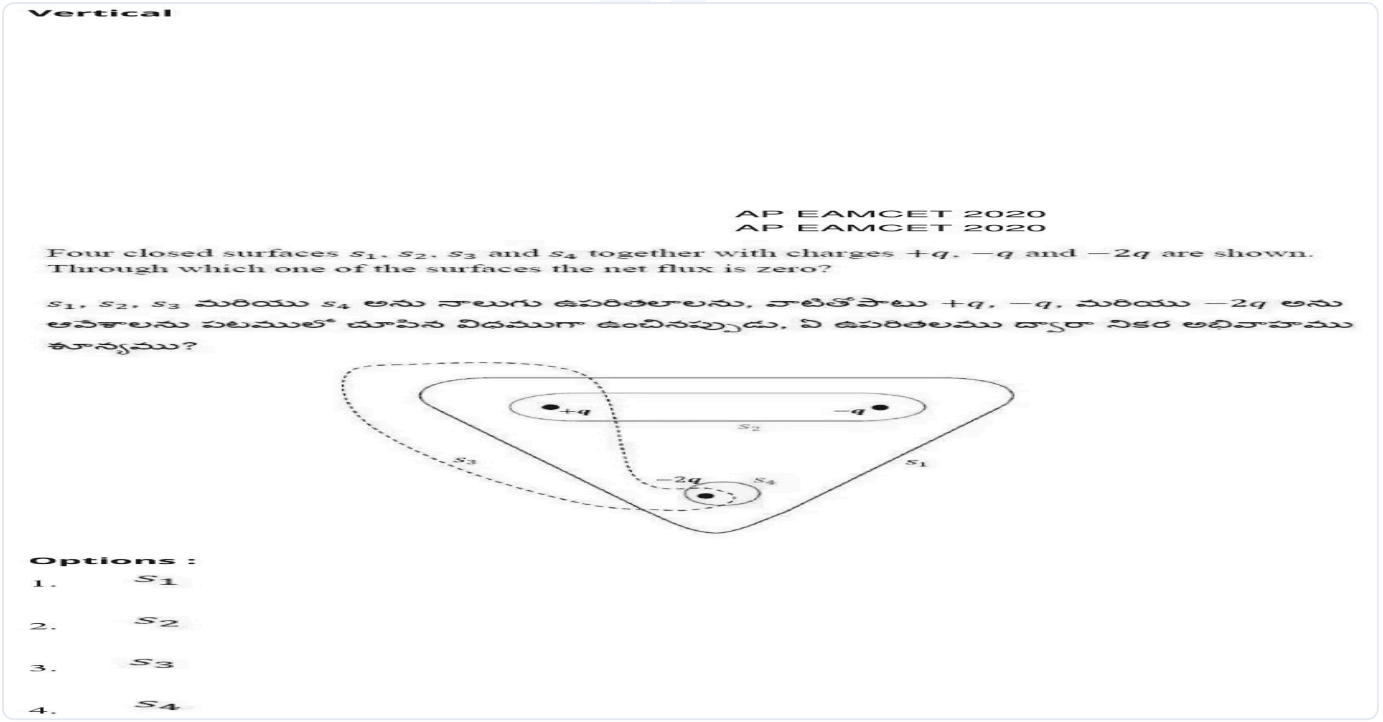
(A) $180\ \mathrm{N.m^2.C^{-1}}$
(B) $90\ \mathrm{N.m^2.C^{-1}}$
(C) $55\ \mathrm{N.m^2.C^{-1}}$
(D) $5\ \mathrm{N.m^2.C^{-1}}$

**Answer: (A)** $180\ \mathrm{N.m^2.C^{-1}}$ · The council's preliminary key

## Q182 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

Four closed surfaces $s_1, s_2, s_3$ and $s_4$ together with charges $+q, -q$ and $-2q$ are shown. Through which one of the surfaces the net flux is zero?

*(see the figure above)*



(A) $s_1$

(B) $s_2$

(C) $s_3$

(D) $s_4$

**Answer: (B)** $s_2$ · The council's preliminary key

## Q183 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If a unit positive charge is taken from one point to another over an equipotential surface, then

(A) Work is done on the charge

(B) Work is done by the charge

(C) Work done is constant

(D) No work is done

**Answer: (D)** No work is done · The council's preliminary key

## Q184 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

An electric dipole is situated in an electric field as shown in figure. The dipole and electric field are both in the plane of paper. The dipole is rotated about an axis, perpendicular to the paper, at point A in anticlockwise direction. If the angle of rotation is measured with respect to the direction of the electric field then the torque for different values of the angle of rotation $\theta$ is correctly represented by which graph among a, b, c, d given in fig(b)?

*(see the figure above)*

Orientation : Vertical

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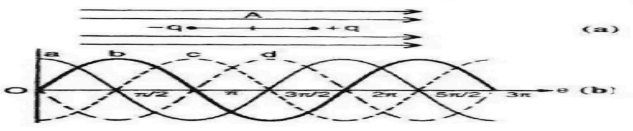
An electric dipole is situated in an electric field as shown in figure. The dipole and electric field are both in the plane of paper. The dipole is rotated about an axis, perpendicular to the paper, at point A in anticlockwise direction. If the angle of rotation is measured with respect to the direction of the electric field then the torque for different values of the angle of rotation θ is correctly represented by which graph among a, b, c, d given in fig(b)?




Options :

1. (a)
2. (b)
3. (c)
4. (d)

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(A) (a)
(B) (b)
(C) (c)
(D) (d)

**Options (2) or (4) were accepted. More than one answer was accepted.** · The council's preliminary key

## Q185 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

The variation of electric potential with distance from a fixed point is shown in figure. What is the value of electric field at $x = 2m$

*(see the figure above)*

Orientation : Vertical

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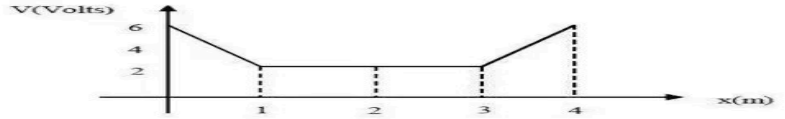
The variation of electric potential with distance from a fixed point is shown in figure. What is the value of electric field at $x = 2m$

ఒక స్థిర బిందువు వద్ద నుంచి దూరముతో మార్పుతో విద్యుత్ పొటెన్షియల్ యొక్క మార్పు కింది పటములో చూపబడినది. $x = 2m$ దూరము వద్ద విద్యుత్ క్షేత్రము విలువ ఎంత ?




Options :
1. 0
2. 3
3. 2
4. 6

(A) 0
(B) 3
(C) 2
(D) 6

**Answer: (A) 0** · The council's preliminary key

## Q186 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Choose the incorrect statement

(A) Gauss's law applies to a closed surface of any shape

(B) according to Gauss's law, if a closed surface encloses no charge, electric field must vanish everywhere on the surface

(C) Gauss's law can be derived from Coulomb's law

(D) according to Gauss's law, the net number of lines crossing any closed surface in an outward direction is proportional to the net charge on surface

**Answer: (B)** according to Gauss's law, if a closed surface encloses no charge, electric field must vanish everywhere on the surface · Official TGCHE final key

## Q187 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

In a regular polygon of 10 sides, each corner is at a distance R from the centre. Identical charges are placed at 9 corners. At the centre, the magnitude of electric field is E and the potential is V. The ratio $\frac{V}{E}$ is

(A) 10 R

(B) 9/R

(C) $\frac{9}{10}R$

(D) 9R

**Answer: (D)** 9R · Official TGCHE final key

## Q188 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

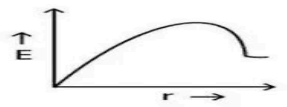
In a uniformly charged sphere of total charge Q and radius R, the electric field E is plotted as function of distance from the centre of the sphere. The graph which would correspond to the above description will be :

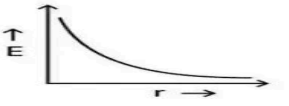
Question Number : 105 Question Id : 7196501385 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

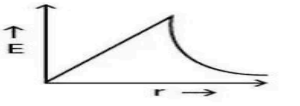
In a uniformly charged sphere of total charge Q and radius R, the electric field E is plotted as function of distance from the centre of the sphere. The graph which would correspond to the above description will be :

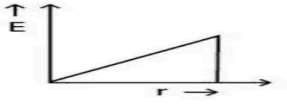
ముద్దం ఆవేశం Q తో సమరితిగా ఆవేశితం చేయబడి R వ్యాసార్ధంగల గోళంలోని విద్యుత్ క్షేత్రం E ను గోళ కేంద్రం నుండి దూరం ప్రమేయంగా పటములో గీయబడింది. వైన చెప్పబడిన వివరణకు సరిపోయే రేఖా చిత్రము

Options :

1. 


2. 


3. 


4. 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

**Answer: (C)** · Official TGCHE final key

## Q189 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

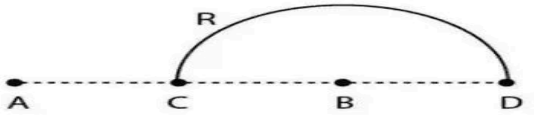
Electric charges $+q$ and $-q$ are placed at points A and B respectively which are at a distance of $2L$ apart. If C is the midpoint between A and B, then the work done in moving a charge $+Q$ along the semi-circle CRD is

*(see the figure above)*

Question Number : 106 Question Id : 7196501386 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Electric charges $+q$ and $-q$ are placed at points A and B respectively which are at a distance of $2L$ apart. If C is the midpoint between A and B, then the work done in moving a charge $+Q$ along the semi-circle CRD is

$2L$ దూరంలో ఉన్న A మరియు B బిందువుల వద్ద విద్యుత్ ఆవేశాలు వరుసగా $+q$ మరియు $-q$ లు ఉంచబడ్డాయి. A మరియు B లకు మధ్య బిందువు 'C' అయితే అర్ధ వృత్తం CRD గుండా ఆవేశం $+Q$ ను జరుపుటకు అవసరమైన పని




Options :

1. $\frac{qQ}{2\pi\varepsilon_0 L}$
2. $\frac{qQ}{6\pi\varepsilon_0 L}$
3. $-\frac{qQ}{6\pi\varepsilon_0 L}$
4. $\frac{qQ}{4\pi\varepsilon_0 L}$

(A) $\frac{qQ}{2\pi\varepsilon_0 L}$
(B) $\frac{qQ}{6\pi\varepsilon_0 L}$
(C) $-\frac{qQ}{6\pi\varepsilon_0 L}$
(D) $\frac{qQ}{4\pi\varepsilon_0 L}$

**Answer: (C)** $-\frac{qQ}{6\pi\varepsilon_0 L}$ · Official TGCHE final key

## Q190 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

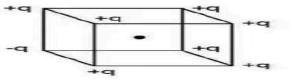
A cube of side L has point charges +q located at its seven vertices and $-$q at remaining one vertex. The electric field at its center is found to be $|\vec{E}| = \alpha\left(\frac{q}{4\pi\epsilon_o L^2}\right)$. The magnitude of constant $\alpha$ is

*(see the figure above)*

Question Number : 105 Question Id : 7196589905 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A cube of side L has point charges +q located at its seven vertices and −q at remaining one vertex. The electric field at its center is found to be $|\vec{E}| = \alpha\left(\frac{q}{4\pi \in_0 L^2}\right)$. The magnitude of constant $\alpha$ is

'L' భుజము-కలిగి గల ఒక ఘనము యొక్క 7 శీర్షాలలో +q బిందు ఆవేశాలు మిగిలిన ఒక శీర్షంలో −q ఉంచబడినవి. దాని మధ్య భాగంలో విద్యుత్ క్షేత్రం విలువ $|\vec{E}| = \alpha\left(\frac{q}{4\pi \in_0 L^2}\right)$ గా ఉన్నప్పుడు స్థిరాంకం 'α' యొక్క పరిమాణం




Options :

1. $\frac{4}{3}$
2. $\frac{8}{3}$
3. 3
4. 1

(A) $\frac{4}{3}$

(B) $\frac{8}{3}$

(C) 3

(D) 1

**Answer: (B)** $\frac{8}{3}$ · Official TGCHE final key

## Q191 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

The electric flux from a cube of edge $l$ is $\phi$ in an enclosed charge. If the edge of the cube is made $\frac{2}{3}\ell$ and the charge enclosed in the cube is doubled, then the electric flux value will be

(A) $4\phi$

(B) $2\phi$

(C) $\phi/2$

(D) $\phi$

**Answer: (B)** $2\phi$ · Official TGCHE final key

## Q192 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

If a proton is moved against the coulomb force of an electric field, then

(A) work is done by the electric field
(B) energy is used from some outside source
(C) the strength of the field is decreased
(D) the strength of the field is increased

**Answer: (B) energy is used from some outside source** · Official TGCHE final key

## Q193 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

Two negative charges of equal magnitude are located in x-y plane as shown below in the figure. The direction of the electric field at point P is
*(see the figure above)*

Question Number : 105 Question Id : 7196505885 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Two negative charges of equal magnitude are located in x-y plane as shown below in the figure. The direction of the electric field at point P is




Options :

1. along positive - x direction
2. along negative - x direction
3. along positive - y direction
4. along negative - y direction

(A) along positive - x direction
(B) along negative - x direction
(C) along positive - y direction
(D) along negative - y direction

**Answer: (B) along negative - x direction** · Official TGCHE final key

## Q194 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

An infinite non-conducting sheet has a surface charge density $2 \times 10^{-7}\ \mathrm{C/m^2}$ on one side. The distance between two equipotential surfaces whose potential differ by 90 V is:
(Assume $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9\ \frac{\mathrm{Nm^2}}{\mathrm{C^2}}$)

(A) $20\,\pi$ mm
(B) $\frac{25}{\pi}$ mm
(C) $\frac{12.5}{\pi}$ mm
(D) $\frac{\pi}{20}$ mm

**Answer: (B)** $\frac{25}{\pi}$ mm · Official TGCHE final key

## Q195 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

A particle of mass $2 \times 10^{-6}$ kg with a charge $5 \times 10^{-6}$ C is hanging in air above a similarly charged conducting surface. The charge density of the surface is (Assume $\epsilon_0 = 8.85 \times 10^{-12}\ \mathrm{C^2N^{-1}M^{-2}}$ and $g = 10\ \mathrm{m/s^2}$)

(A) $35.4 \times 10^{-12}\ \mathrm{C/m^2}$
(B) $23.6 \times 10^{-12}\ \mathrm{C/m^2}$
(C) $53.1 \times 10^{-12}\ \mathrm{C/m^2}$
(D) $17.7 \times 10^{-12}\ \mathrm{C/m^2}$

**Answer: (A)** $35.4 \times 10^{-12}\ \mathrm{C/m^2}$ · Official TGCHE final key

## Q196 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

The electrostatic potential inside a charged spherical ball is given by $\Phi = ar^2 + b$, where $r$ is the distance from the centre and $a, b$ are constant. Then the charge density inside the ball is ($\varepsilon_0$ = Permittivity in free space)

(A) $-6a\varepsilon_0 r$
(B) $-6a\varepsilon_0$
(C) $-24\pi a\varepsilon_0$
(D) $-24\pi a\varepsilon_0 r$

**Answer: (B)** $-6a\varepsilon_0$ · Official TGCHE final key

## Q197 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

A thin metallic spherical shell of radius $r$ contains a charge $Q$ on its surface. A point charge $q_1$ is placed at the centre of shell and another charge $q_2$ is placed outside the shell at a distance $x$ from the centre. Then the forces on charges $q_1$ and $q_2$ respectively are:

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(A) $\frac{1}{4\pi\varepsilon_0}\frac{q}{r^2}, \frac{1}{4\pi\varepsilon_0}\frac{q_1+q_2}{x^2}$

(B) $\frac{1}{4\pi\varepsilon_0}\frac{q}{r^2}, \frac{1}{4\pi\varepsilon_0}\frac{q_1 q_2}{x^2}$

(C) zero, $\frac{q_2}{4\pi\varepsilon_0}\frac{Q}{x^2}$

(D) zero, $\frac{q_2}{4\pi\varepsilon_0}\frac{Q+q_1}{x^2}$

**Answer: (D)** zero, $\frac{q_2}{4\pi\varepsilon_0}\frac{Q+q_1}{x^2}$ · Official TGCHE final key

## Q198 TS EAMCET 2019 · 6 May · Shift 1 MCQ

A spherical volume contains a uniformly distributed charge of density $1.0 \times 10^{-6}$ C/m$^3$. Find the electrical field (in N/C) at a point inside the volume at a distance 1 mm from the centre. (Let $\frac{1}{4\pi\epsilon_o} = 9 \times 10^9\ \mathrm{Nm^2C^{-2}}$)

(A) $\left(\frac{8}{\pi}\right)$

(B) $(6\pi)$

(C) $\left(\frac{\pi}{6}\right)$

(D) $(12\pi)$

**Answer: (D)** $(12\pi)$ · Official TGCHE final key

## Q199 TS EAMCET 2019 · 4 May · Shift 1 MCQ

A non-conducting solid sphere has radius R and uniform charge density. A spherical cavity of radius $R/4$ is hollowed out of the sphere. The distance between center of sphere and center of cavity is $R/2$. If the charge of the sphere is Q after the creation of the cavity and the magnitude of electric field at the center of the cavity is $E = K\left(\frac{Q}{4\pi\epsilon_0 R^2}\right)$, determine the approximate value of K

(A) $0.32$

(B) $0.78$

(C) $0.51$

(D) $0.45$

**Answer: (C)** $0.51$ · Official TGCHE final key

## Q200 TS EAMCET 2019 · 4 May · Shift 2 MCQ

A negative charge is placed at the centre of the non-conducting sphere. The direction of electric field on any point at the surface of the sphere is

(A) Radially inward
(B) Radially outward
(C) Along the tangent to the surface
(D) No electric field produced

**Answer: (A) Radially inward** · Official TGCHE final key

## Q201 TS EAMCET 2019 · 4 May · Shift 2 MCQ

A spherical drop of liquid carrying charge Q has potential $V_0$ at its surface. If two drops of same charge and radius combine to form a single spherical drop, then the potential at the surface of new drop is (Assume $V = 0$ at infinity)

(A) $2^{1/3}V_0$
(B) $4^{1/3}V_0$
(C) $6^{1/3}V_0$
(D) $2^{-1/3}V_0$

**Answer: (B)** $4^{1/3}V_0$ · Official TGCHE final key

## Q202 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Two small conducting balls of identical mass 20 g and identical charge $10^{-10}$ C hang from non conducting threads of length L = 300 cm. If the equilibrium separation of balls is $x$ and $x \ll L$, then the magnitude of $x$ is (Assume $4\pi\epsilon_0 = \frac{1}{9\times10^9}$ F/m and g = 10 m/s$^2$)

(A) $\frac{2}{5^{1/3}}$ mm
(B) $\frac{3}{10^{1/3}}$ mm
(C) $\frac{3^{1/3}}{10}$ mm
(D) $\frac{3^{2/3}}{5}$ mm

**Answer: (B)** $\frac{3}{10^{1/3}}$ mm · Official TGCHE final key

## Q203 TS EAMCET 2019 · 3 May · Shift 1 MCQ

The space between the two large parallel plates is filled with a material of uniform charge density '$\rho$'. Assume that one of the plate is kept at $x = 0$. The potential at any point '$x$' between these plates is given by (A and B are constants)

*(see the figure above)*

Question Number : 106 Question Id : 75123644266 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The space between the two large parallel plates is filled with a material of uniform charge density 'ρ'. Assume that one of the plate is kept at $x = 0$. The potential at any point 'x' between these plates is given by (A and B are constants)

రెండు పెద్ద సమాంతర పలకల మధ్య గల ప్రదేశాన్ని ఏకరీతి విద్యుదావేశ సాంద్రత 'ρ' గల పదార్థంతో నింపినారు. వీటిలో ఒక పలకను $x = 0$ వద్ద ఉంచినారని ఊహించండి. ఈ పలకల మధ్య ఏదైనా బిందువు 'x' వద్ద పొటెన్షియల్ విలువ (A మరియు B లు స్థిరాంకాలు)




TS EAMCET 2019

Options :

1. $-\frac{\rho x^3}{2\epsilon_0}$

2. $-\left(\frac{\rho x^2}{2\epsilon_0} + Ax\right)$

3. $-\left(\frac{\rho x^2}{2\epsilon_0} + Ax + B\right)$

4. $-\left(\frac{\rho x^3}{4\epsilon_0} + Ax^2 + Bx\right)$

(A) $-\frac{\rho x^3}{2\epsilon_0}$

(B) $-\left(\frac{\rho x^2}{2\epsilon_0} + Ax\right)$

(C) $-\left(\frac{\rho x^2}{2\epsilon_0} + Ax + B\right)$

(D) $-\left(\frac{\rho x^3}{4\epsilon_0} + Ax^2 + Bx\right)$

**Answer: (C)** $-\left(\frac{\rho x^2}{2\epsilon_0} + Ax + B\right)$ · Official TGCHE final key

## Q204 TS EAMCET 2019 · 3 May · Shift 2 MCQ

An infinite line of charge with uniform line charge density of 1 C/m is placed along the $y$-axis. A charge of 1 C is placed on the $x$-axis at a distance of $d$ = 3 m from the origin. At what distance ($r$) from the origin on the $x$-axis, the total electric field is zero. (Assume $0 < r < d$)

(A) 1 m

(B) 2 m

(C) 2.5 m

(D) 1.75 m

**Answer: (B)** 2 m · Official TGCHE final key

## Q205 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

Two particles with charges $+3.72\ \mu C$ and $+1.86\ \mu C$ are some distance apart. If 20% of charge is transferred from first particle to second particle then electrostatic force between them is

(A) decreases by 12%
(B) increases by 12%
(C) increases by 4%
(D) decreases by 4%

**Answer: (B) increases by 12%** · Official APSCHE final key

## Q206 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

ABC is a right angled triangle in which $AB = 3$ cm, $BC = 4$ cm and right angle is at B. Three charges $+15\ \mu C$, $+12\ \mu C$ and $-20\ \mu C$ are placed respectively at A, B and C. The force acting on charge at B is

(A) 1250 N
(B) 3500 N
(C) 1200 N
(D) 2250 N

**Answer: (D)** 2250 N · Official APSCHE final key

## Q207 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

Six point charges each of magnitude 'Q' are placed at the vertices of a regular hexagon of side 'a' as shown in the figure. Electric field intensity on the line passing through the centre 'O' and perpendicular to the plane of the figure at a large distance $x(\gg a)$ from 'O' is $\left(\frac{1}{4\pi\epsilon_0} = k\right)$

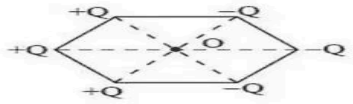
*(see the figure above)*

Question Number : 104 Question Id : 1874634424 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Six point charges each of magnitude 'Q' are placed at the vertices of a regular hexagon of side 'a' as shown in the figure. Electric field intensity on the line passing through the centre 'O' and perpendicular to the plane of the figure at a large distance x(>>a) from 'O' is

$\left(\frac{1}{4\pi\epsilon_0} = k\right)$

ఒక్కొక్కటి 'Q' పరిమాణము గల ఆరు ఆవేశాలను 'a' భుజముగల క్రమషడ్భుజి శీర్షముల వద్ద పటంలో చూపిన విధంగా ఉంచినారు. కేంద్రము 'O' గుండా పోతూ పటతలమునకు లంబంగా గల సరళరేఖపై 'O' నుండి అధికదూరము x(>>a) వద్ద విద్యుత్ క్షేత్ర తీవ్రత $\left(\frac{1}{4\pi\epsilon_0} = k\right)$




Options :

1. $k \times \frac{4Qa}{x^3}$
2. $k \times \frac{2Qa}{x^3}$
3. $k \times \frac{8Qa}{x^3}$
4. 0

(A) $k \times \frac{4Qa}{x^3}$

(B) $k \times \frac{2Qa}{x^3}$

(C) $k \times \frac{8Qa}{x^3}$

(D) 0

**Answer: (A)** $k \times \frac{4Qa}{x^3}$ · Official APSCHE final key

## Q208 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

A regular hexagon of side 5 cm has a charge 10 $\mu$C at each of its vertices. The potential at the centre of hexagon is

(A) 0 V

(B) $18 \times 10^5$ V

(C) $1.08 \times 10^7$ V

(D) $1.08 \times 10^5$ V

**Answer: (C)** $1.08 \times 10^7$ V · Official APSCHE final key

## Q209 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

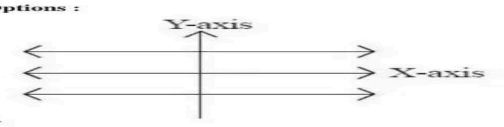
The potential in an electric field varies as $V = (x^2 - y^2)$. The electric lines of the force in X-Y plane are

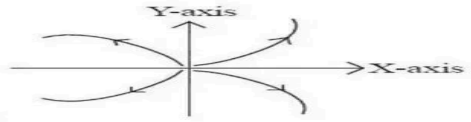
Question Number : 107 Question Id : 1874634427 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

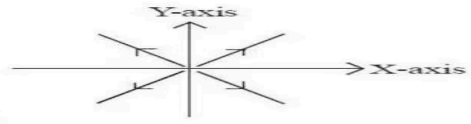
The potential in an electric field varies as $V = (x^2 - y^2)$. The electric lines of the force in $X - Y$ plane are

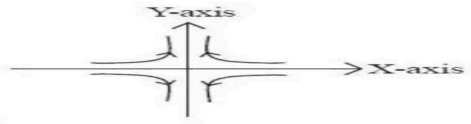
ఒక విద్యుత్ క్షేత్రంలో విద్యుత్ పొటెన్షియల్, $V = (x^2 - y^2)$ తో మారుతూ ఉంది. $X - Y$ తలంలో ఆ క్షేత్ర విద్యుత్ బలరేఖలు

Options :

1. 


2. 


3. 


4. 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

**Answer: (D)** · Official APSCHE final key

## Q210 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

A dipole has two charges $+1\ \mu\text{C}$ and $-1\ \mu\text{C}$ and each of mass $1\ \text{kg}$. The separation between the charges is $1\ \text{m}$. An electric field $20 \times 10^3\ \text{Vm}^{-1}$ is applied on the dipole. If the dipole is deflected through $2^\circ$ from equilibrium position, then the time taken by it to come to equilibrium position again is

(A) $2.5\,\pi\ \text{s}$
(B) $5\,\pi\ \text{s}$
(C) $15\,\pi\ \text{s}$
(D) $\pi\ \text{s}$

**Answer: (A)** $2.5\,\pi\ \text{s}$ · Official APSCHE final key

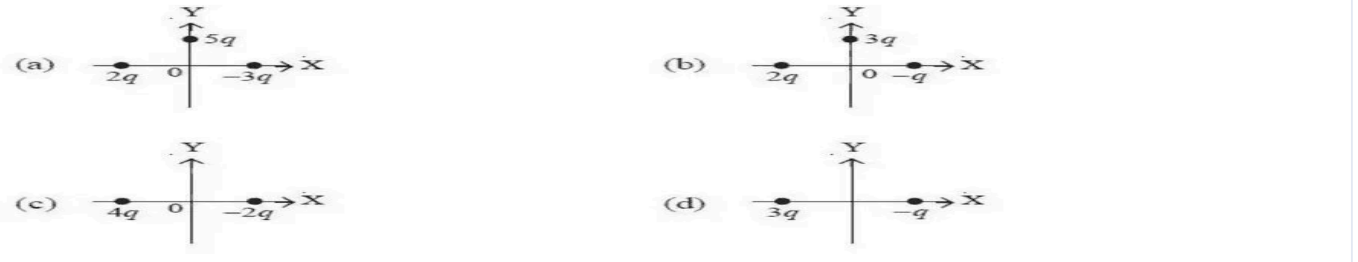
## Q211 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

In the following four cases, charged particles are at equal distances from the origin. Arrange them in the descending order of magnitude of the net electric field at the origin.
*(see the figure above)*

Question Number : 105 Question Id : 1874634585 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the following four cases, charged particles are at equal distances from the origin. Arrange them in the descending order of magnitude of the net electric field at the origin.

క్రింది నాలుగు సందర్భాలలో విద్యుదావేశ కణాలు మూలబిందువు నుండి సమాన దూరాలలో ఉన్నవి. మూలబిందువు వద్ద విద్యుత్ క్షేత్రం విలువలు అవరోహణ క్రమములో




Options :
1. a, b, c, d
2. b, a, c, d
3. a, c, b, d
4. d, c, b, a

(A) a, b, c, d
(B) b, a, c, d
(C) a, c, b, d
(D) d, c, b, a

**Answer: (C) a, c, b, d** · Official APSCHE final key

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**Q212** AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

A charge '5 C' is placed at the centre of shell of radius $r = 3\ \mathrm{m}$ and having charge '5 C'. The potential at a point $\frac{r}{2}$ distance from the centre of the shell will be

(A) $-9 \times 10^9\ \mathrm{V}$
(B) $30 \times 10^9\ \mathrm{V}$
(C) $45 \times 10^9\ \mathrm{V}$
(D) $-15 \times 10^9\ \mathrm{V}$

**Answer: (C)** $45 \times 10^9\ \mathrm{V}$ · Official APSCHE final key

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**Q213** AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

The electric field intensity at a point on the axis of an electric dipole in air is $4\,\mathrm{NC}^{-1}$. Then the electric field intensity at a point on the equitorial line which is at a distance equal to twice the distance on the axial line and if the dipole is in a medium of dielectric constant 4 is

(A) $1\,\mathrm{NC}^{-1}$
(B) $\frac{1}{8}\,\mathrm{NC}^{-1}$
(C) $16\,\mathrm{NC}^{-1}$
(D) $\frac{1}{16}\,\mathrm{NC}^{-1}$

**Answer: (D)** $\frac{1}{16}\,\mathrm{NC}^{-1}$ · Official APSCHE final key

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**Q214** AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

Two small spheres of each charge 'q', mass 'm' and material density 'd' are suspended from a fixed point with the help of inextensible light thread. When the spheres are in air, the angle between the threads is $90^\circ$. When the spheres are suspended in a liquid of density $\frac{2}{3}$ d, the angle between the threads is $60^\circ$. The value of dielectric constant of the liquid is

(A) $6\sqrt{3}$
(B) $2\sqrt{5}$
(C) $5\sqrt{3}$
(D) $7\sqrt{2}$

**Answer: (A)** $6\sqrt{3}$ · Official APSCHE final key

## Q215 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

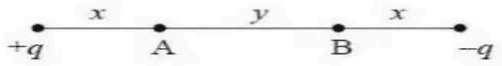
The potential difference $(V_A - V_B)$ in the arrangement shown in figure is ($|q| = 1\,\mu C$, $x = 2$ cm, $y = 3$ cm)

*(see the figure above)*

Question Number : 106 Question Id : 1874634106 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The potential difference $(V_A - V_B)$ in the arrangement shown in figure is ($|q| = 1\ \mu C$, $x = 2$ cm, $y = 3$ cm)

పటములో చూపిన అమరికలో పొటెన్షియల్ భేదం $(V_A - V_B)$ విలువ ($|q| = 1\ \mu C$, $x = 2$ cm, $y = 3$ cm)




Options :

1. $5.4 \times 10^5$ V
2. $2.7 \times 10^5$ V
3. $5.4 \times 10^2$ V
4. $2.7 \times 10^2$ V

(A) $5.4 \times 10^5$ V

(B) $2.7 \times 10^5$ V

(C) $5.4 \times 10^2$ V

(D) $2.7 \times 10^2$ V

**Answer: (A)** $5.4 \times 10^5$ V · Official APSCHE final key

## Q216 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

Two long parallel plates A and B are separated by a distance of 4 cm with an electric field of $45.5\ \mathrm{Vm}^{-1}$ between the plates directed normally from plate A to plate B, as shown in the figure. An electron is projected from plate A with velocity v at an angle of $30^\circ$ with the surface of plate A. The maximum value of v so that the electron does not hit plate B is

(Assume gravity free space, charge of electron $= 1.6 \times 10^{-19}$ C and mass of electron $= 9.1 \times 10^{-31}$ kg )

*(see the figure above)*

Question Number : 105 Question Id : 1874634265 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two long parallel plates A and B are separated by a distance of 4 cm with an electric field of 45.5 $Vm^{-1}$ between the plates directed normally from plate A to plate B, as shown in the figure. An electron is projected from plate A with velocity v at an angle of 30° with the surface of plate A. The maximum value of v so that the electron does not hit plate B is (Assume gravity free space, charge of electron = $1.6 \times 10^{-19}$ C and mass of electron = $9.1 \times 10^{-31}$ kg)

పటంలో చూపిన విధంగా 4 cm దూరంతో వేరుచేయబడిన A మరియు B అనే రెండు సమాంతర పలకల మధ్య 45.5 $Vm^{-1}$ విద్యుత్ క్షేత్రం పలక A నుండి లంబదిశలో పలక B వైపు కలదు. పలక A తలానికి 30° కోణం చేసే విధంగా పలక A నుండి ఒక ఎలక్ట్రాన్‌ను v వేగంతో విసిరారు. ఎలక్ట్రాను పలక B ని తగలకుండా ఉండాలంటే v గరిష్ఠ విలువ (గురుత్వ రహిత ప్రదేశంను తీసుకొనుము, ఎలక్ట్రాన్ ఆవేశం = $1.6 \times 10^{-19}$ C మరియు ఎలక్ట్రాన్ ద్రవ్యరాశి = $9.1 \times 10^{-31}$ kg)




Options :

1. 400 km $s^{-1}$
2. 3200 km $s^{-1}$
3. 800 km $s^{-1}$
4. 1600 km $s^{-1}$

(A) 400 km $s^{-1}$

(B) 3200 km $s^{-1}$

(C) 800 km $s^{-1}$

(D) 1600 km $s^{-1}$

**Answer: (D)** 1600 km $s^{-1}$ · Official APSCHE final key

## Q217 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

Three point charges of 2 mC each are kept at the vertices of an equilateral triangle of side 50 cm. If the system is supplied energy at the rate of 2 kW, the time taken to move one of the charges to the mid point of the line joining the other two charges is

(A) 18 s

(B) 36 s

(C) 72 s

(D) 144 s

**Answer: (C)** 72 s · Official APSCHE final key

## Q218 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

Two identical charged spheres separated by a distance repel each other with a force F. If 10% of electrons are thransferred (sic) from one sphere to the other then the force between them becomes

(A) F

(B) 1.21 F

(C) 0.99 F

(D) 0.81 F

**Answer: (C)** 0.99 F · Official APSCHE final key

## Q219 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

Three charges of each magnitude 100 $\mu$C are placed at the corners A, B and C of an equilateral triangle of side 4 m. If the charges at A and C are positive and the charge at point B is negative, then the magnitude of total force acting on charge at 'C' and angle made by it with $\overrightarrow{AC}$ are

(A) 5.625 N, $60^\circ$

(B) 0.5625 N, $60^\circ$

(C) 5.625 N, $30^\circ$

(D) 0.5625 N, $30^\circ$

**Answer: (A)** 5.625 N, $60^\circ$ · Official APSCHE final key

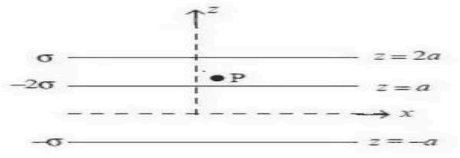
## Q220 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

Three infinitely long charged sheets are placed as shown in the figure. The electric force acting on a charge $-q$ placed at the point P is ($\sigma$ - surface charge density, $\varepsilon_0$ - permittivity of free space)
*(see the figure above)*

Question Number : 104 Question Id : 1874633944 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three infinitely long charged sheets are placed as shown in the figure. The electric force acting on a charge $-q$ placed at the point P is
($\sigma$ - surface charge density, $\varepsilon_0$ - permittivity of free space)

అనంతమైన పొడవుగల ఆవేశ పరచబడిన మూడు పలకలను పటములో చూపిన విధంగా అమర్చినారు.
'P' బిందువు వద్ద ఉంచిన $-q$ ఆవేశం పై పనిచేయు విద్యుత్ బలం
($\sigma$ - ఉపరితల ఆవేశ సాంద్రత, $\varepsilon_0$ - స్వేచ్ఛాంతరాళం యొక్క పెర్మిటివిటి)




Options :

1. $+\frac{2\sigma}{\varepsilon_0}\hat{k}$

2. $-\frac{2\sigma}{\varepsilon_0}\hat{k}$

3. $+\frac{4\sigma}{\varepsilon_0}\hat{k}$

4. $-\frac{4\sigma}{\varepsilon_0}\hat{k}$

(A) $+\frac{2\sigma}{\varepsilon_0}\hat{k}$
(B) $-\frac{2\sigma}{\varepsilon_0}\hat{k}$
(C) $+\frac{4\sigma}{\varepsilon_0}\hat{k}$
(D) $-\frac{4\sigma}{\varepsilon_0}\hat{k}$

**Any attempt was accepted. Full marks for attempting.** · Official APSCHE final key

## Q221 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

Assertion (A) : Half of the charge of an electron does not exist.
Reason (R) : Electric charge is quantized.

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

**Answer: (A)** Both (A) and (R) are correct and (R) is the correct explanation of (A). · Official APSCHE final key

## Q222 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

The potential difference between two points $\mathrm{A}(2,1,0)\mathrm{m}$ and $\mathrm{B}(0,2,4)\mathrm{m}$ in an electric field $(x\hat{i}-2y\hat{j}+z\hat{k})\ \mathrm{Vm}^{-1}$ is

(A) $2\ \mathrm{V}$
(B) $3\ \mathrm{V}$
(C) $1\ \mathrm{V}$
(D) $6\ \mathrm{V}$

**Answer: (B)** $3\ \mathrm{V}$ · Official APSCHE final key

## Q223 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

Three point charges of $3\ \mu\mathrm{C}$, $4\ \mu\mathrm{C}$ and $5\ \mu\mathrm{C}$ are arranged at the three corners of a right angled triangle ABC as shown in the figure. The work done in moving the charges at A and C so that the three charges are located at the three corners of an equilateral triangle of side 3 cm is
*(see the figure above)*

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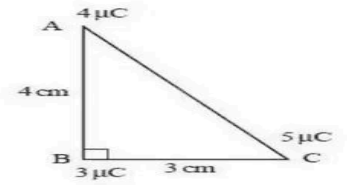
Question Number : 107 Question Id : 1874633947 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three point charges of 3 μC, 4 μC and 5 μC are arranged at the three corners of a right angled triangle ABC as shown in the figure. The work done in moving the charges at A and C so that the three charges are located at the three corners of an equilateral triangle of side 3 cm is

3 μC, 4 μC మరియు 5 μC ఆవేశాలు కలిగిన మూడు బిందు ఆవేశాలు పటంలో చూపిన విధంగా ఒక లంబకోణ త్రిభుజం ABC మూడు శీర్షాల వద్ద కలవు. ఈ మూడు ఆవేశాలను 3 cm భుజం గల ఒక సమబాహుత్రిభుజం శీర్షాల వద్ద ఉండేటట్లు A మరియు C వద్ద గల ఆవేశాలను కదల్చుటకు చేయవలసిన పని




Options :

1. 0.3 J
2. 1.1 J
3. 2.2 J
4. 3.3 J

(A) $0.3$ J

(B) $1.1$ J

(C) $2.2$ J

(D) $3.3$ J

**Answer: (D)** $3.3$ J · Official APSCHE final key

## Q224 TS EAMCET 2018 · 7 May · Shift 1 MCQ

Choose the incorrect statement from the following

(A) The electric field in electrostatics obey principle of superposition

(B) The electric field inside a perfect conductor is zero

(C) The electric dipole will try to orient in a direction opposite to the external electric field

(D) The electric flux passing through any closed surface enclosing the charges remains constant

**Answer: (C) The electric dipole will try to orient in a direction opposite to the external electric field** · The council's preliminary key

## Q225 TS EAMCET 2018 · 5 May · Shift 1 MCQ

A solid sphere of radius $r_1 = 1$ cm carries charge distributed uniformly over it with density $\rho_1 = -3\ \mathrm{C/cm^3}$. It is surrounded by a concentric spherical shell of radius $r_2 = 2$ cm carrying uniform charge density $\rho_2 = \frac{1}{2}\ \mathrm{C/cm^2}$. If $E_d$ denotes the magnitude of the electric field at distance $d$ from the common centre of the spheres, then

(A) $E_d = \dfrac{1}{3\varepsilon_o d^2}, \quad d \leq 1\,\text{cm}$

(B) $E_d = \dfrac{1}{\varepsilon_o d^2}, \quad d \leq 1\,\text{cm}$

(C) $E_d = \dfrac{d}{3\varepsilon_o}, \quad d \leq 1\,\text{cm}$

(D) $E_d = \dfrac{d}{\varepsilon_o}, \quad d \leq 1\,\text{cm}$

**Answer: (D)** $E_d = \dfrac{d}{\varepsilon_o}, \quad d \leq 1\,\text{cm}$ · The council's preliminary key

## Q226 TS EAMCET 2018 · 5 May · Shift 1 MCQ

Two isolated, concentric, conducting spherical shells have radii $R$ and $2R$ and uniform charges $q$ and $2q$ respectively. If $V_1$ and $V_2$ are potentials at points located at distances $3R$ and $\dfrac{R}{2}$, respectively, from the center of shells, then the ratio $\left(\dfrac{V_2}{V_1}\right)$ will be

(A) 2

(B) 1

(C) $\dfrac{1}{2}$

(D) 0

**Answer: (A)** 2 · The council's preliminary key

## Q227 TS EAMCET 2018 · 5 May · Shift 2 MCQ

A thin spherical shell encloses a concentric solid sphere. The radius of the shell is $(0.06)^{\frac{1}{2}}\ \text{m}$ and its surface charge density is $-10^{-6}\ \text{C/m}^2$. The radius of the solid sphere is $(0.01)^{\frac{1}{3}}\ \text{m}$ and its volumetric charge density is $3 \times 10^{-5}\ \text{C/m}^3$. $\epsilon_0$ is the permittivity of free space in $\text{C}^2/\text{Nm}^2$. The electric flux through a spherical surface concentric with the spherical shell and of radius greater than that of the shell, in $Vm$, is

(A) $\dfrac{0.4\pi \times 10^{-7}}{\epsilon_0}$

(B) $\dfrac{0.8\pi \times 10^{-7}}{\epsilon_0}$

(C) $\dfrac{1.2\pi \times 10^{-7}}{\epsilon_0}$

(D) $\dfrac{1.6\pi \times 10^{-7}}{\epsilon_0}$

**Answer: (D)** $\dfrac{1.6\pi \times 10^{-7}}{\epsilon_0}$ · The council's preliminary key

## Q228 TS EAMCET 2018 · 5 May · Shift 2 MCQ

A conducting sphere $S_1$ of radius $r_1$ is connected by a conducting wire to another conducting sphere $S_2$ of radius $r_2$ where $r_1 = 3\ \text{cm}$ and $r_2 = 2\ \text{cm}$. Before they are connected, $S_1$ carries charge of 10

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units. The electric potential at the point which is at a distance $4\ \text{cm}$ from the centre of $S_1$ and a distance $3\ \text{cm}$ from the centre of $S_2$ is

(A) $\frac{1}{4\pi\epsilon_0}\frac{17}{6}$
(B) $\frac{1}{4\pi\epsilon_0}\frac{3}{2}$
(C) $\frac{1}{4\pi\epsilon_0}\frac{1}{6}$
(D) $\frac{1}{4\pi\epsilon_0}\frac{17}{12}$

**Answer: (A)** $\frac{1}{4\pi\epsilon_0}\frac{17}{6}$ · The council's preliminary key

## Q229 TS EAMCET 2018 · 4 May · Shift 1 MCQ

A point charge of 50 $\mu$C is placed in the $XY$ plane at a location with radius vector $\vec{r_0} = 2\hat{i} + 3\hat{j}$ m. The electric field strength and its magnitude at a point with radius vector $\vec{r} = 8\hat{i} - 5\hat{j}$ m is ($\epsilon_0 = 8.85 \times 10^{-12}$ C$^2$ / N-m$^2$)

(A) 4.5 kV/m
(B) 45 kV/m
(C) 0.45 kV/m
(D) 450 kV/m

**Answer: (A)** 4.5 kV/m · The council's preliminary key

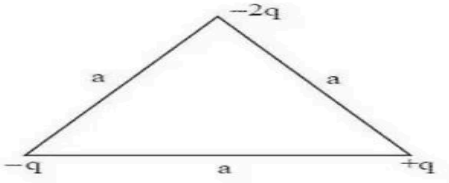
## Q230 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The work done to assemble the three charges in a configuration as shown in the figure below is *(see the figure above)*

Question Number : 106 Question Id : 4928631706 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct : 1 Wrong : 0

The work done to assemble the three charges in a configuration as shown in the figu below is

పటంలో చూపిన ఆకృతిలో మూడు ఆవేశాలను అమర్చడానికి చేయవలసిన పని




Options :
1. $\frac{-3q^2}{4\pi\varepsilon_0 a}$
2. $\frac{-2q^2}{4\pi\varepsilon_0 a}$
3. $\frac{-q^2}{4\pi\varepsilon_0 a}$
4. 0

(A) $\frac{-3q^2}{4\pi\varepsilon_0 a}$
(B) $\frac{-2q^2}{4\pi\varepsilon_0 a}$
(C) $\frac{-q^2}{4\pi\varepsilon_0 a}$
(D) 0

**Answer: (C)** $\frac{-q^2}{4\pi\varepsilon_0 a}$ · Checked by our team

## Q231 TS EAMCET 2018 · 4 May · Shift 2 MCQ

The volume charge density in a spherical ball of radius $R$ varies with distance $r$ from the centre as $\rho(r) = \rho_0\left[1 - \left(\frac{r}{R}\right)^3\right]$ where $\rho_0$ is a constant. The radius at which the field would be maximum is

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

**Answer: (A)** $\frac{R}{2^{1/3}}$ · The council's preliminary key

## Q232 TS EAMCET 2018 · 4 May · Shift 2 MCQ

The potential $\phi(x, y)$ of an electrostatic field $\vec{E} = a(y\hat{i} + x\hat{j})$ is
[$a$ is a constant and $\hat{i}$ and $\hat{j}$ are unit vectors along X and Y axes]

(A) $-2axy + c$ ($c$ is a constant)
(B) $axy + c$ ($c$ is a constant)
(C) $a^2xy + c$ ($c$ is a constant)
(D) $a(xy)^2 + c$ ($c$ is a constant)

**Answer: (A)** $-2axy + c$ ($c$ is a constant) · The council's preliminary key

## Q233 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

Flux coming out from a positive charge of 8 C, placed in a medium of dielectric constant 4 is

(A) $\frac{1}{2\epsilon_0}$
(B) $\frac{2}{\epsilon_0}$
(C) $8\epsilon_0$
(D) $32\epsilon_0$

**Answer: (B)** $\frac{2}{\epsilon_0}$ · The council's preliminary key

## Q234 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

Two charged particles each of mass 9.8 g and charges $+20\ \mu C$ and $-20\ \mu C$ are attached to the two ends of a massless and rigid uniform non-conducting rod of length 50 cm. This arrangement is held

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in a uniform electric field of $12.1\ \mathrm{NC}^{-1}$ such that the rod makes a very small angle with the field direction. If the rod is set free, the minimum time needed for the rod to become parallel to the direction of the electric field is _____ seconds.

(A) 5
(B) 8
(C) 12
(D) 17

**Answer: (A)** 5 · The council's preliminary key

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**Q235** AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

Two charged particles of masses in the ratio 1 : 3 have charges in reciprocal ratio as their masses. They are placed in a uniform electric field and allowed to move. The ratio of their kinetic energies is

(A) $9:1$
(B) $4:3$
(C) $3:1$
(D) $27:1$

**Answer: (D)** $27:1$ · The council's preliminary key

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**Q236** AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

Two point charges $-5\mu\mathrm{C}$ and $+5\mu\mathrm{C}$ are placed at A and B respectively on a straight line separated by 5 cm. At a point C if the resultant field is parallel to the line joining the points A and B then

(A) $AC = BC$
(B) $2AC = BC$
(C) $AC = 2BC$
(D) $AC = \frac{BC}{3}$

**Answer: (A)** $AC = BC$ · The council's preliminary key

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**Q237** AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

Match the following List-I with the List-II
List - I
A) Gauss's law
B) Faraday's law
C) Ampere's law
D) Kirchhoff's law
List - II
I) Surface charge density
II) Electric charge and energy conservation
III) Change in magnetic flux

IV) Change in electric flux
V) Total electric flux
The correct answer is

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

**Answer: (C) A-V, B-III, C-IV, D-II** · The council's preliminary key

## Q238 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

Two equally charged metal spheres A and B repel each other with a force of $4 \times 10^{-5}$ N. Another identical uncharged sphere C is touched to A and then placed at the mid point of the line joining the spheres A and B. The net electric force on the sphere C is

(A) $4 \times 10^{-5}$ N from C to A
(B) $4 \times 10^{-5}$ N from C to B
(C) $8 \times 10^{-5}$ N from C to A
(D) $8 \times 10^{-5}$ N from C to B

**Answer: (A) $4 \times 10^{-5}$ N from C to A** · The council's preliminary key

## Q239 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

Four positive point charges +q are kept at the four corners of a square of side 'l'. The net electric field at the midpoint of any one side of the square is _____
(take $\frac{1}{4\pi\epsilon_0} = k$)

(A) $\frac{4kq}{l^2}$
(B) $\frac{16kq}{5\sqrt{5}\,l^2}$
(C) $\frac{8kq}{\sqrt{5}\,l^2}$
(D) $\frac{kq}{l^2}$

**Answer: (B) $\frac{16kq}{5\sqrt{5}\,l^2}$** · The council's preliminary key

## Q240 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

A Van de Graff generator has a spherical metal shell as an electrode which is at a potential $15 \times 10^6$ V. If the dielectric strength of the surrounding medium is $5 \times 10^7\ \mathrm{Vm}^{-1}$ then the diameter of the shell is

(A) 30 cm
(B) 15 cm
(C) 60 cm
(D) 120 cm

**Answer: (C) 60 cm** · The council's preliminary key

**Q241** AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

A proton and an $\alpha$ - particle start from rest in a uniform electric field. The ratio of times taken by them to travel the same distance in the field is _____

(A) $\sqrt{5} : \sqrt{2}$
(B) $\sqrt{3} : 1$
(C) $2 : 1$
(D) $1 : \sqrt{2}$

**Answer: (D)** $1 : \sqrt{2}$ · The council's preliminary key

**Q242** AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

Two charged balls moving in the same direction with same velocity v are placed in an electric field. After some time, one ball moves with velocity $\frac{v}{2}$ at an angle of $60^\circ$ with the initial direction and the other ball moves at right angles to the initial direction with a velocity v'. Then the value of v' is

(A) $\frac{v}{\sqrt{2}}$
(B) $\frac{v}{\sqrt{3}}$
(C) $\frac{v}{2}$
(D) v

**Answer: (B)** $\frac{v}{\sqrt{3}}$ · The council's preliminary key

**Q243** AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

Electric field vector in a region is given by $\vec{E} = (3\hat{i} + 4y\hat{j})\ \mathrm{Vm}^{-1}$. The potential at the origin is zero. Then the potential at a point (2,1) m is

(A) 7 V
(B) 8 V
(C) $-8$ V
(D) $-7$ V

**Answer: (C)** $-8$ V · The council's preliminary key

**Q244** AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

Two point charges are kept in air with a separation between them. The force between them is $F_1$, if half of the space between the charges is filled with a dielectric of dielectric constant 4 and the force between them is $F_2$, if $\frac{1}{3}$rd of the space between the charges is filled with dielectric of dielectric constant 9. Then $\frac{F_1}{F_2}$ is

(A) $\frac{27}{64}$
(B) $\frac{16}{81}$
(C) $\frac{81}{64}$
(D) $\frac{100}{81}$

**Answer: (D)** $\frac{100}{81}$ · The council's preliminary key

**Q245** AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

The electric field due to a short electric dipole at a distance 'r' on the axial line from its mid point is x times the electric field at a distance 2r on the equitorial line from the mid point of the dipole. Then the value of x is

(A) $16$
(B) $9$
(C) $25$
(D) $36$

**Answer: (A)** $16$ · The council's preliminary key

**Q246** AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

A point charge 'q' is placed at origin. Let $\vec{E}_A$, $\vec{E}_B$ and $\vec{E}_C$ be the electric fields at three points A(1, 2, 3), B(1, 1, $-1$) and C(2, 2, 2) respectively due to the charge 'q'. Then the relation between them is
a) $\vec{E}_A \perp \vec{E}_B$
b) $\vec{E}_A \parallel \vec{E}_C$
c) $|\vec{E}_B| = 4|\vec{E}_C|$
d) $|\vec{E}_B| = 8|\vec{E}_C|$

(A) a, d are correct
(B) b, d are correct
(C) a, c are correct
(D) b, c are correct

**Answer: (C)** a, c are correct · The council's preliminary key

**Q247** AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

An electric dipole consists of two particles each of mass 1 kg separated by 1 m carrying charges $1\ \mu\text{C}$ and $-1\ \mu\text{C}$ respectively. It is in equilibrium in a uniform electric field of $2 \times 10^4\ \text{Vm}^{-1}$. If it is deflected

by a small angle $2^{\circ}$, minimum time taken by it to come back again to the mean position is (in seconds)

(A) $2.5\,\pi$
(B) $2\,\pi$
(C) $5\,\pi$
(D) $4\,\pi$

**Answer: (A)** $2.5\,\pi$ · The council's preliminary key

## Q248 TS EAMCET 2017 · 12 May · Offline MCQ

A positive charge 'Q' is placed on a conducting spherical shell with inner radius $R_1$ and outer radius $R_2$. A particle with charge 'q' is placed at the center of the spherical cavity. The magnitude of the electric field at a point in the cavity, a distance 'r' from center is

(A) zero
(B) $\frac{Q}{4\pi\varepsilon_0 \mathrm{R}^2}$
(C) $\frac{q}{4\pi\varepsilon_0 r^2}$
(D) $\frac{(q+Q)}{4\pi\varepsilon_0 r^2}$

**Answer: (C)** $\frac{q}{4\pi\varepsilon_0 r^2}$ · The council's preliminary key

## Q249 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

The uniform electric field intensity between the two plates of a parallel plate capacitor is $1 \times 10^3\ \mathrm{Vm}^{-3}$ (sic) acting vertically upwards as shown in the figure. The plates are sufficiently long and have separation 2 cm. A particle of negative charge $1\,\mu\mathrm{C}$ and mass 2 g is projected at an angle $45^{\circ}$ with the electric field from the lower plate with a velocity 'u'. The maximum velocity acquired by the particle if it is not hit the upper plate is

*(see the figure above)*

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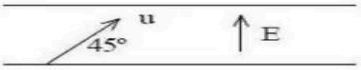
Question Number : 104 Question Id : 1017174584 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The uniform electric field intensity between the two plates of a parallel plate capacitor i $1 \times 10^3\ \mathrm{Vm^{-3}}$ acting vertically upwards as shown in the figure. The plates are sufficientl long and have separation 2 cm. A particle of negative charge 1 μC and mass 2 g is projecte at an angle 45° with the electric field from the lower plate with a velocity 'u'. The maximu velocity acquired by the particle if it is not hit the upper plate is

ఒక సమాంతర పలకల కెపాసిటర్ యొక్క రెండు పలకల మధ్య ఏకరీతి విద్యుత్ క్షేత్ర తీవ్రత $1 \times 10$ $\mathrm{Vm^{-3}}$ నిట్టనిలువుగా పటంలో చూపిన విధంగా పనిచేస్తూ వుంది. ఆ పలకలు తగిన పొడవు మరియ వాటి మధ్య 2 cm దూరం కల్గి వున్నాయి. ఋణ విద్యుదావేశం 1 μC మరియు ద్రవ్యరాశి 2 g గల ఒ కణాన్ని క్రింది పలక నుంచి క్షేత్ర దిశకు 45° కోణంలో 'u' వేగంతో ప్రక్షిప్తం చేసినారు. ఆ కణంపై పలకన ఢీకొనకపోయిన అది పొందే గరిష్ఠ వేగము




Options :

1. $0.1\ \mathrm{ms^{-1}}$
2. $0.2\ \mathrm{ms^{-1}}$
3. $2\ \mathrm{ms^{-1}}$
4. $1\ \mathrm{ms^{-1}}$

(A) $0.1\ \mathrm{ms^{-1}}$

(B) $0.2\ \mathrm{ms^{-1}}$

(C) $2\ \mathrm{ms^{-1}}$

(D) $1\ \mathrm{ms^{-1}}$

**Answer: (B)** $0.2\ \mathrm{ms^{-1}}$ · The council's preliminary key

## Q250 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

An infinitely long thin straight wire has uniform linear charge density of $\frac{1}{3}\ \mathrm{Cm^{-1}}$. Then the magnitude of the force acting on a charge $3\ \mu\mathrm{C}$ situated at a point of 18 cm away from the wire is $\left(\frac{1}{4\pi\epsilon_0} = 9 \times 10^9\ \mathrm{Nm^2C^{-2}}\right)$

(A) $10^5\ \mathrm{N}$

(B) $2 \times 10^5\ \mathrm{N}$

(C) $\frac{1}{3} \times 10^6\ \mathrm{N}$

(D) $3 \times 10^{11}\ \mathrm{N}$

**Answer: (A)** $10^5\ \mathrm{N}$ · The council's preliminary key

## Q251 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

An electrostatic paint sprayer has a metal sphere of diameter 18 cm and at a potential of 25 kV. If it sprays paint droplets, the charge on the metal sphere is

(A) $0.5\ \mu\text{C}$
(B) $0.25\ \mu\text{C}$
(C) $2.5\ \mu\text{C}$
(D) $25\ \mu\text{C}$

**Answer: (B)** $0.25\ \mu\text{C}$ · The council's preliminary key

## Q252 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Two identical simple pendulums each of length 5 cm are suspended from the same support. When the bobs are given equal charge of $2\ \mu\text{C}$ each, distance between the bobs becomes 6 cm. Mass of each bob is ($g = 10\ \text{ms}^{-2}$).

(A) $\frac{4}{3}\ \text{kg}$
(B) $\frac{3}{4}\ \text{kg}$
(C) $\frac{5}{3}\ \text{kg}$
(D) $\frac{3}{5}\ \text{kg}$

**Answer: (A)** $\frac{4}{3}\ \text{kg}$ · The council's preliminary key

## Q253 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

'N' point charges are distributed into two groups and separated by a fixed distance. Then the ratio of maximum to minimum forces between the two groups is (N is even and greater than 2).

(A) $\frac{(N-1)^2}{4N^2}$
(B) $\frac{4N^2}{N-1}$
(C) $\frac{N^2}{4(N-1)}$
(D) $\frac{2N^2}{N-1}$

**Answer: (C)** $\frac{N^2}{4(N-1)}$ · The council's preliminary key

## Q254 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Three charges Q, +q and +q are placed at the vertices of a right angled isosceles triangle as shown in the figure. If the net electrostatic potential energy of the system is zero, the value of Q is

*(see the figure above)*

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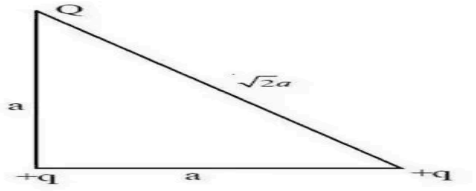
Question Number : 106 Question Id : 1017174746 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three charges Q, +q and +q are placed at the vertices of a right angled isosceles triangle shown in the figure. If the net electrostatic potential energy of the system is zero, the val of Q is

Q, +q మరియు +q అను మూడు ఆవేశాలను పటంలో చూపినట్లుగా లంబకోణ సమద్విబాహు త్రిభుజ శీర్షాల వద్ద వరుసగా అమర్చబడ్డాయి. వ్యవస్థ పరిత స్థిర విద్యుత్ స్థితిజశక్తి శూన్యమయితే Q విలువ




Options :

1. $\frac{-2q}{2+\sqrt{2}}$
2. $\frac{+q}{2+\sqrt{2}}$
3. $\frac{+2q}{2+\sqrt{2}}$
4. $\frac{-q}{2+\sqrt{2}}$

(A) $\frac{-2q}{2+\sqrt{2}}$

(B) $\frac{+q}{2+\sqrt{2}}$

(C) $\frac{+2q}{2+\sqrt{2}}$

(D) $\frac{-q}{2+\sqrt{2}}$

**Answer: (A)** $\frac{-2q}{2+\sqrt{2}}$ · The council's preliminary key

## Q255 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

If 'n' electrons are placed on each of the two small spheres with their centres spaced 3 cm apart so that they repel each other by a force of $10^{-19}$ N then 'n' will be $\left[\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9\ \mathrm{Nm^2C^{-2}}\right]$

(A) 125

(B) 225

(C) 625

(D) 1250

**Answer: (C)** 625 · The council's preliminary key

## Q256 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

Three charged particles of each mass 0.1 g and charge 'q' are suspended from a common rigid point by insulated massless threads of each 1 m long. If the three particles are in equilibrium and are located at the corners of an equilateral triangle of side 3 cm, the charge 'q' on each particle is _____

nC. (The angle made by the line joining the centroid of the triangle and the point of suspension with the vertical is very small). (Acceleration due to gravity = 10 $\mathrm{ms}^{-2}$ and $\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9\ \mathrm{Nm}^2\mathrm{C}^{-2}$)

(A) 100
(B) 10
(C) 1
(D) 0.1

**Answer: (C) 1** · The council's preliminary key

**Q257** AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

Two neutral conducting spheres of diameters 8 cm and 2 cm separated with a distance of 15 cm between their centres are joined by a thin conducting wire. A charge of 100 nC is given to one of the spheres and the system is allowed to reach electrostatic equilibrium. The electric potential at a point on the line joining the centres of the two spheres where the net electric field becomes zero is _____ V. (Neglect the charge acquired by the wire and $\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9\ \mathrm{Nm}^2\mathrm{C}^{-2}$)

(A) $10.8 \times 10^3$
(B) $10.8 \times 10^4$
(C) $5.4 \times 10^3$
(D) $5.4 \times 10^4$

**Answer: (A)** $10.8 \times 10^3$ · The council's preliminary key

**Q258** AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

Electric field in a region is given by $\vec{E} = a\hat{i} + b\hat{j}$, where a and b are constants. The net flux passing through a square area of side $l$ parallel to y-z plane is

(A) $al^2$
(B) $al$
(C) $bl^2$
(D) $bl$

**Answer: (A)** $al^2$ · The council's preliminary key

**Q259** AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

The linear charge densities of two infinitely long thin and parallel wires are $4\ \mathrm{Cm}^{-1}$ and $8\ \mathrm{Cm}^{-1}$ and separation between them is 4 cm. Then the electric field intensity at mid point on the line joining them is

(A) $18 \times 10^{11}\ \mathrm{NC}^{-1}$
(B) $36 \times 10^{11}\ \mathrm{NC}^{-1}$
(C) $9 \times 10^{11}\ \mathrm{NC}^{-1}$
(D) $72 \times 10^{11}\ \mathrm{NC}^{-1}$

**Answer: (B)** $36 \times 10^{11}\ \mathrm{NC}^{-1}$ · The council's preliminary key

## Q260 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

Two conducting spheres of radii 9 cm and 1 cm are separated by a distance of 20 cm in free space. If the spheres are charged to same potential of 10 V each, the force of repulsion between them is

(A) $\frac{4}{9} \times 10^{-9}\ \mathrm{N}$
(B) $\frac{10^{-9}}{4}\ \mathrm{N}$
(C) $\frac{10^{-9}}{3}\ \mathrm{N}$
(D) $4 \times 10^{-9}\ \mathrm{N}$

**Answer: (B)** $\frac{10^{-9}}{4}\ \mathrm{N}$ · The council's preliminary key

## Q261 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

Three concentric spherical metallic shells A, B and C of radii $a = 7$ cm, $b = 17$ cm and 'c' ($a < b < c$) have surface charge densities $\sigma$, $-\sigma$ and $\sigma$ respectively. If A and C are at the same potential, then the value of 'c' is

(A) 20 cm
(B) 10 cm
(C) 34 cm
(D) 24 cm

**Answer: (D)** 24 cm · The council's preliminary key

## Q262 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

A charged bead is sliding freely through a string held vertically under tension. An electric field is applied parallel to the string so that the bead stays at rest at the middle of the string. If the electric field is switched off momentarily and switched on again, then

(A) the bead falls off momentarily and then stopped
(B) the bead moves downwards and then moves upwards
(C) the bead moves downwards with constant acceleration
(D) the bead moves downwards with constant velocity

**Answer: (D) the bead moves downwards with constant velocity** · The council's preliminary key

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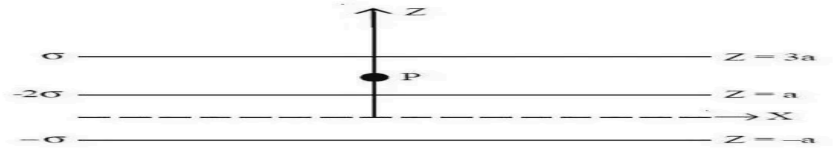
## Q263 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

Three infinitely long charged non-conducting sheets are placed as shown in the figure. The electric field at point 'P' is ($\sigma$ - charge density, $\epsilon_0$ - permittivity of free space) (sic: closing bracket missing in the print)

*(see the figure above)*

Question Number : 196 Question Id : 16171734786 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three infinitely long charged non-conducting sheets are placed as shown in the figure. Th electric field at point 'P' is ($\sigma$ - charge density, $\epsilon_0$ - permittivity of free space)




Options :

1. $\frac{2\sigma}{\epsilon_0}\hat{k}$
2. $\frac{-3\sigma}{\epsilon_0}\hat{k}$
3. $\frac{4\sigma}{\epsilon_0}\hat{k}$
4. $\frac{-2\sigma}{\epsilon_0}\hat{k}$

(A) $\frac{2\sigma}{\epsilon_0}\hat{k}$

(B) $\frac{-3\sigma}{\epsilon_0}\hat{k}$

(C) $\frac{4\sigma}{\epsilon_0}\hat{k}$

(D) $\frac{-2\sigma}{\epsilon_0}\hat{k}$

**Answer: (D)** $\frac{-2\sigma}{\epsilon_0}\hat{k}$ · The council's preliminary key

## Q264 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

Five identical conducting plates, each of face area A are placed parallel to each other with a separation of 'd' between two adjacent plates as shown in the figure. The plates M and N are given charges $Q_1$ and $Q_2$ respectively and the remaining plates are neutral. If the outermost plates are grounded, the potential difference between the plates M and N is _____

*(see the figure above)*

Question Number : 107 Question Id : 1017173787 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Five identical conducting plates, each of face area A are placed parallel to each other with a separation of 'd' between two adjacent plates as shown in the figure. The plates M and N are given charges $Q_1$ and $Q_2$ respectively and the remaining plates are neutral. If the outermost plates are grounded, the potential difference between the plates M and N is _____

ఒక్కొక్కటి A ముఖవైశాల్యం గల ఐదు సర్వసమాన పలకలను, రెండు వరుస పలకల మధ్య దూరం 'd' ఉండేటట్లుగా పటంలో చూపిన విధంగా సమాంతరంగా ఉంచినారు. M మరియు N పలకలకు వరుసగా $Q_1$ మరియు $Q_2$ ఆవేశాలను ఇచ్చి, మిగతా పలకలను తటస్థంగా ఉంచారు. బాహ్య పలకలను భూమికి సంధానించిన, M మరియు N పలకల మధ్య గల పొటెన్షియల్ భేదం _____




Options :

1. $\frac{2d(Q_1 - Q_2)}{\epsilon_0 A}$
2. $\frac{d(Q_1 - Q_2)}{2\epsilon_0 A}$
3. $\frac{4d(Q_1 - Q_2)}{\epsilon_0 A}$
4. $\frac{d(Q_1 - Q_2)}{4\epsilon_0 A}$

(A) $\frac{2d(Q_1 - Q_2)}{\epsilon_0 A}$

(B) $\frac{d(Q_1 - Q_2)}{2\epsilon_0 A}$

(C) $\frac{4d(Q_1 - Q_2)}{\epsilon_0 A}$

(D) $\frac{d(Q_1 - Q_2)}{4\epsilon_0 A}$

**Answer: (B)** $\frac{d(Q_1 - Q_2)}{2\epsilon_0 A}$ · The council's preliminary key

## Q265 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

When 4 C, Q C and 1 C electrical charges are placed along a straight line of length '$l$' at 0, $\frac{l}{2}$ and $l$ respectively. The respective values of Q so that the net force on 4 C is zero and 1 C is zero separately are (in coulomb)

(A) $-1, \frac{1}{4}$

(B) $\frac{-1}{2}, \frac{-1}{4}$

(C) $\frac{-1}{4}, -1$

(D) $\frac{-1}{4}, \frac{-1}{2}$

**Answer: (C)** $\frac{-1}{4}, -1$ · The council's preliminary key

## Q266 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

Two charged particles of each of mass 3 g and charge 0.2 $\mu$C stay in (vacuum) equilibrium on a horizontal surface with a separation of 20 cm. The coefficient of friction is $\left[\frac{1}{4\pi\epsilon_0} = 9 \times 10^9\ \mathrm{Nm^2C^{-2}}\right]$ ( $g = 10\ \mathrm{ms^{-2}}$)

(A) 0.20
(B) 0.18
(C) 0.25
(D) 0.30

**Answer: (D)** 0.30 · The council's preliminary key

## Q267 TS EAMCET 2016 · 15 May · Offline MCQ

Two charged identical metal spheres A and B repel each other with a force of $3 \times 10^{-5}$ N. Another identical uncharged sphere C is touched with sphere A and then it is placed midway between A and B. Then the magnitude of Net force on C is

(A) $1 \times 10^{-5}$ N
(B) $3 \times 10^{-5}$ N
(C) $2 \times 10^{-5}$ N
(D) $5 \times 10^{-5}$ N

**Answer: (B)** $3 \times 10^{-5}$ N · Official TGCHE final key

## Q268 TS EAMCET 2016 · 15 May · Offline MCQ

The electrostatic potential inside a charged sphere is given as $V = Ar^2 + B$, where r is the distance from the center of the sphere; A and B are constants. Then the charge density in the sphere is

(A) $16\,A\,\epsilon_0$
(B) $-6\,A\,\epsilon_0$
(C) $20\,A\,\epsilon_0$
(D) $-15\,A\,\epsilon_0$

**Answer: (B)** $-6\,A\,\epsilon_0$ · Official TGCHE final key

## Q269 AP EAMCET 2016 · 29 Apr · Offline MCQ

Two charges each of charge $+10\ \mu$c are kept on Y-axis at $y = -a$ and $y = +a$ respectively. Another point charge $-20\ \mu$c is placed at the origin and given a small displacement $x$ ($x \ll a$) along X-axis. The force acting on the point charge is ($x$ and $a$ are in metres, $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9\ \mathrm{Nm^2C^{-2}}$)

(A) $\frac{3.6x}{a^2}$ N
(B) $\frac{2.4x^2}{a}$ N
(C) $\frac{3.6x}{a^3}$ N
(D) $\frac{4.8x}{a^2}$ N

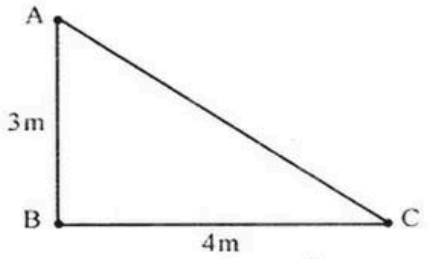
**Answer: (C)** $\frac{3.6x}{a^3}$ N · The council's preliminary key

## Q270 AP EAMCET 2016 · 29 Apr · Offline MCQ

Three idential (sic) charges, each $2\ \mu C$ lie at the vertices of a right angled triangle as shown in the figure. Forces on the charge at B due to the charges at A and C respectively are $F_1$ and $F_2$. The angle between their resultant force and $F_2$ is *(see the figure above)*

105. Three idential charges, each 2 μC lie at the vertices of a right angled triangle as shown in the figure. Forces on the charge at B due to the charges at A and C respectively are $F_1$ and $F_2$. The angle between their resultant force and $F_2$ is

ఒక్కొక్కటి 2 μC గల సర్వసమానమైన ఆవేశాలు పటంలో చూపబడిన లంబకోణ త్రిభుజం మూలల వద్ద వరుసగా ఉన్నాయి. B వద్ద గల ఆవేశముపై A మరియు C వద్ద గల ఆవేశముల వలన బలములు వరుసగా $F_1$ మరియు $F_2$. ఈ బలముల ఫలిత బలానికి $F_2$ కి మధ్య గల కోణము




(1) $\tan^{-1}\left(\frac{9}{16}\right)$ (2) $\tan^{-1}\left(\frac{9}{7}\right)$ (3) $\tan^{-1}\left(\frac{16}{9}\right)$ (4) $\tan^{-1}\left(\frac{7}{9}\right)$

(A) $\tan^{-1}\left(\frac{9}{16}\right)$

(B) $\tan^{-1}\left(\frac{9}{7}\right)$

(C) $\tan^{-1}\left(\frac{16}{9}\right)$

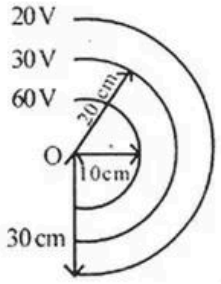
(D) $\tan^{-1}\left(\frac{7}{9}\right)$

**Answer: (C)** $\tan^{-1}\left(\frac{16}{9}\right)$ · The council's preliminary key

## Q271 AP EAMCET 2016 · 29 Apr · Offline MCQ

The figure shows equipotential surfaces concentric at 'O'. The magnitude of electric field at a distance 'r' meters from 'O' is *(see the figure above)*

106. The figure shows equipotential surfaces concentric at 'O'. The magnitude of electric field at a distance 'r' meters from 'O' is
పటం నందు 'O' ఏక కేంద్రంగా గల సమ పొటన్షియల్ తలాలు సూచించబడినవి. 'O' నుండి 'r' మీటర్ల దూరంలో విద్యుత్ క్షేత్ర విలువ




(1) $\frac{9}{r^2}\mathrm{Vm}^{-1}$ (2) $\frac{16}{r^2}\mathrm{Vm}^{-1}$ (3) $\frac{2}{r^2}\mathrm{Vm}^{-1}$ (4) $\frac{6}{r^2}\mathrm{Vm}^{-1}$

(A) $\frac{9}{r^2}\ \mathrm{Vm}^{-1}$
(B) $\frac{16}{r^2}\ \mathrm{Vm}^{-1}$
(C) $\frac{2}{r^2}\ \mathrm{Vm}^{-1}$
(D) $\frac{6}{r^2}\ \mathrm{Vm}^{-1}$

**Answer: (D)** $\frac{6}{r^2}\ \mathrm{Vm}^{-1}$ · The council's preliminary key

## Q272 AP EAMCET 2016 · 29 Apr · Offline MCQ

A region contains a uniform electric field $\vec{E} = (10\hat{i} + 30\hat{j})\ \mathrm{Vm}^{-1}$. A and B are two points in the field at (1, 2, 0) m and (2, 1, 3) m respectively. The work done when a charge of 0.8 C moves from A to B in a parabolic path is

(A) 8 J
(B) 80 J
(C) 40 J
(D) 16 J

**Answer: (D)** 16 J · The council's preliminary key

## Q273 AP EAMCET 2014 · 22 May · Offline MCQ

A charge Q is divided into two charges q and Q − q. The value of q such that the force between them is maximum, is

(A) $Q$
(B) $\frac{3Q}{4}$
(C) $\frac{Q}{2}$
(D) $\frac{Q}{3}$

**Answer: (C)** $\frac{Q}{2}$ · The council's preliminary key

## Q274 AP EAMCET 2014 · 22 May · Offline MCQ

Two concentric hollow spherical shells have radii r and R (R $\gg$ r). A charge Q is distributed on them such that the surface charge densities are equal. The electric potential at the centre is

(A) $\frac{Q(R+r)}{4\pi\epsilon_0(R^2+r^2)}$
(B) $\frac{Q(R^2+r^2)}{4\pi\epsilon_0(R+r)}$
(C) $\frac{Q}{R+r}$
(D) $0$

**Answer: (A)** $\frac{Q(R+r)}{4\pi\epsilon_0(R^2+r^2)}$ · The council's preliminary key

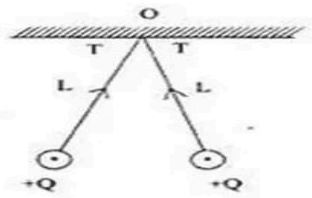
## Q275 AP EAMCET 2012 · 12 May · Offline MCQ

Two small spheres each having equal positive charge Q (Coulomb) on each are suspended by two insulating strings of equal length L (meter) from a rigid hook (shown in Fig.). The whole set up is taken into satellite where there is no gravity. The two balls are now held by electrostatic forces in horizontal position, the tension in each string is then

*(see the figure above)*

**109.** Two small spheres each having equal positive charge Q (Coulomb) on each are suspended by two insulating strings of equal length L (meter) from a rigid hook (shown in Fig.). The whole set up is taken into satellite where there is no gravity. The two balls are now held by electrostatic forces in horizontal position, the tension in each string is then

ఒక్కొక్కటి సమాన విద్యుదావేశం (+ Q) కలిగిన రెండు చిన్న గోళాలు L మీ పొడవు గల బంధకం తీగలతో ఒక కొక్కెం నుండి వేలాడదీయబడి ఉన్నాయి (పటంలో చూపినట్లుగా). ఈ మొత్తం వ్యవస్థ గురుత్వాకర్షణ లేని శాటిలైట్‌లోనికి తీసుకొని వెళ్ళబడింది. ఆ రెండు గోళాలు కేవలం స్థిర విద్యుత్ బలం మూలంగా క్షితిజ సమాంతర పట్టుతో ఉంటాయి. ఇప్పుడు తీగలో ఉండే తన్యత విలువ




(1) $\frac{Q^2}{16\pi\varepsilon_0 L^2}$ (2) $\frac{Q^2}{8\pi\varepsilon_0 L^2}$ (3) $\frac{Q^2}{4\pi\varepsilon_0 L^2}$ (4) $\frac{Q^2}{2\pi\varepsilon_0 L^2}$

(A) $\frac{Q^2}{16\pi\epsilon_0 L^2}$
(B) $\frac{Q^2}{8\pi\epsilon_0 L^2}$
(C) $\frac{Q^2}{4\pi\epsilon_0 L^2}$
(D) $\frac{Q^2}{2\pi\epsilon_0 L^2}$

**Answer: (A)** $\frac{Q^2}{16\pi\epsilon_0 L^2}$ · Official APSCHE final key

## Q276 AP EAMCET 2010 · 30 May · Offline MCQ

The potential difference between two parallel plates is $10^4$ volts. If the plates are separated by 0.5 cm, the force on an electron between the plates is :

(A) $32 \times 10^{-13}$ N
(B) $0.32 \times 10^{13}$ N
(C) $0.032 \times 10^{-13}$ N
(D) $3.2 \times 10^{-13}$ N

**Answer: (D)** $3.2 \times 10^{-13}$ N · Official APSCHE final key

## Q277 AP EAMCET 2010 · 30 May · Offline MCQ

Three particles $\alpha$-particle, proton and deuteron are accelerated by the same potential difference. The velocities of them are in the ratio :

(A) $1 : \sqrt{2} : 1$
(B) $\sqrt{2} : 1 : 1$
(C) $1 : 2 : 4$
(D) $4 : 2 : 1$

**Answer: (A)** $1 : \sqrt{2} : 1$ · Official APSCHE final key

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