

PhysicsByAaryan

CSIR NET . GATE . JEST . BARC - Physics

Multipoles - CSIR NET Physics PYQs

Electromagnetism . All PYQs (2015-2025) with answer key

4 questions . Answer key included

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Q1. [Dec 2017] . 3.5 marks

Electromagnetism > Multipoles

CSIR NET	2017 Dec	3.5M
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Two point charges $+3Q$ and $-Q$ are placed at $(0,0,d)$ and $(0,0,2d)$ respectively, above an infinite grounded conducting sheet kept in the xy - plane. At a point $(0,0,z)$, where $z \gg d$, the electrostatic potential of this charge configuration would approximately be

1. $\frac{1}{4\pi\epsilon_0} \frac{d^2}{z^3} Q$

2. $\frac{1}{4\pi\epsilon_0} \frac{2d}{z^2} Q$

3. $\frac{1}{4\pi\epsilon_0} \frac{3d}{z^2} Q$

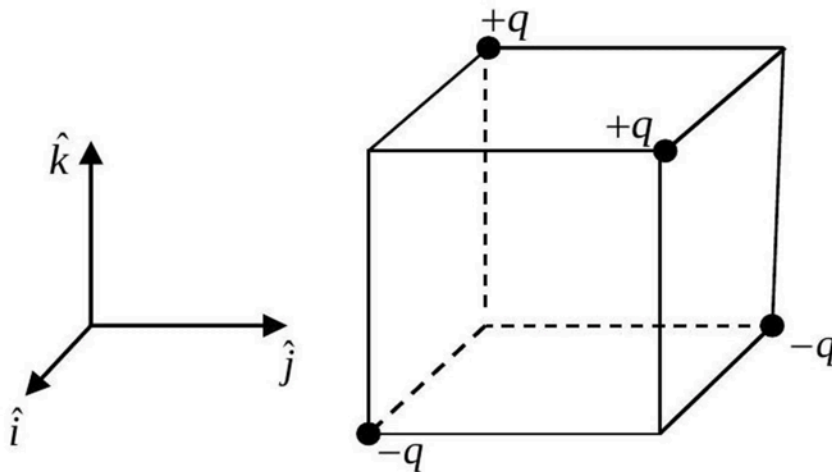
4. $-\frac{1}{4\pi\epsilon_0} \frac{d^2}{z^3} Q$

Q2. [June 2022] . 3.5 marks

Electromagnetism > Multipoles

CSIR NET	2022 June	3.5M
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Two positive and two negative charges of magnitude q are placed on the alternate vertices of a cube of side a (as shown in the figure).



The electric dipole moment of this charge configuration is

1. $-2qa\hat{k}$
2. $2qa\hat{k}$
3. $2qa(\hat{i} + \hat{j})$
4. $2qa(\hat{i} - \hat{j})$

Q3. [June 2024] . 3.5 marks

Electromagnetism > Multipoles

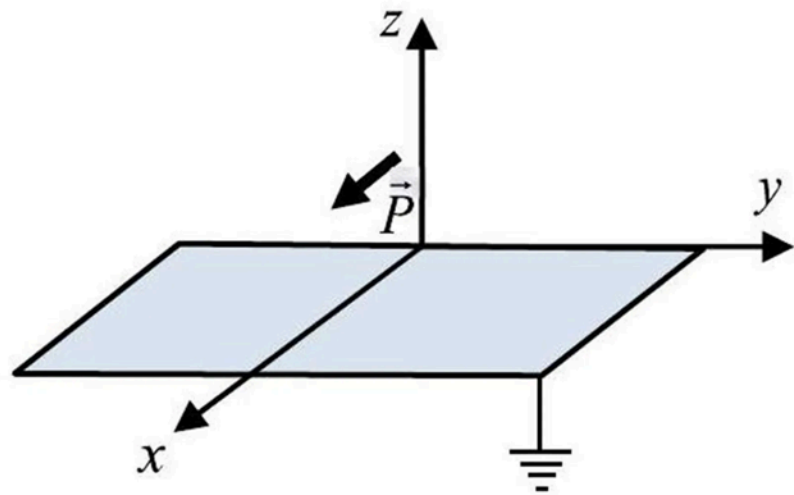
CSIR NET

2024 June

3.5M

A point electric dipole $\vec{P} = p_x \hat{i}$ is placed at a vertical distance d above a grounded infinite conducting xy plane as shown in the figure. At a point \vec{r} ($r \gg d, z > 0$) far away from the dipole, the electrostatic potential $V(r)$ varies approximately as

1. $\frac{1}{r^2}$
2. $\frac{1}{r^6}$
3. $\frac{1}{r^3}$
4. $\frac{1}{r^4}$



Q4. [Dec 2025] . 3.5 marks

Electromagnetism > Multipoles

CSIR NET	2025 Dec	3.5M	EMT
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A circular disc of radius R is made of 2 halves (as shown in the figure), separated by a dielectric of negligible thickness (along the y axis.)

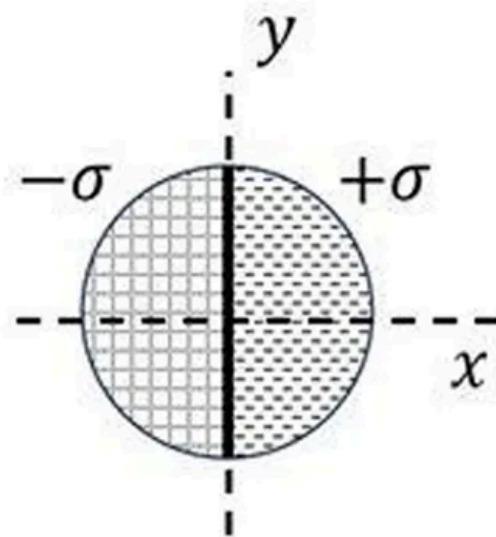
If the surface charge density on the right half is $+\sigma$ and that on the left half is $-\sigma$, the dipole moment of the disc is

$$1. P_x = 0, P_y = \frac{1}{3} \sigma R^3$$

$$2. P_x = 0, P_y = \frac{4}{3} \sigma R^3$$

$$3. P_x = \frac{1}{3} \sigma R^3, P_y = 0$$

$$4. P_x = \frac{4}{3} \sigma R^3, P_y = 0$$



Answer Key

4 questions . Subject and topic for quick revision

Q. No	Subject	Topic	Answer
Q1	Electromagnetism	Multipoles	2
Q2	Electromagnetism	Multipoles	2
Q3	Electromagnetism	Multipoles	3
Q4	Electromagnetism	Multipoles	4

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