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NEET ELECTRIC CHARGES AND FIELDS — COULOMB'S LAW — PYQS

Max. Marks: 36 **Questions:** 9

Section A (MCQ) — 9 questions

Q.1 Two identical charged conducting spheres A and B have their centres separated by a certain distance. Charge on each sphere is q and the force of repulsion between them is F. A third identical uncharged conducting sphere is brought in contact with sphere A first and then with B and finally removed from both. New force of repulsion between spheres A and B (Radii of A and B are negligible compared to the distance of separation so that for calculating force between them they can be considered as point charges) is best given as:

[NEET (UG) 2025]

(1) $\frac{F}{2}$ (2) $\frac{3F}{8}$ (3) $\frac{3F}{5}$ (4) $\frac{2F}{3}$

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Q.2 The ratio of Coulomb's electrostatic force to the gravitational force between an electron and a proton separated by some distance is 2.4×10^{39}. The ratio of the proportionality constant, $K = \frac{1}{4\pi\varepsilon_0}$ to the gravitational constant G is nearly (Given that the charge of the proton and electron each $= 1.6 \times 10^{-19}$ C, the mass of the electron $= 9.11 \times 10^{-31}$ kg, the mass of the proton $= 1.67 \times 10^{-27}$ kg) : [NEET (UG) 2022 (Phase 2)]

(1) 10 (2) 10^{20} (3) 10^{30} (4) 10^{40}

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Q.3 Two point charges A and B, having charges +Q and −Q respectively, are placed at certain distance apart and force acting between them is F. If 25% charge of A is transferred to B, then force between the charges becomes : [NEET (UG) 2019]

(1) F (2) $\frac{16F}{9}$ (3) $\frac{9F}{16}$ (4) $\frac{4F}{3}$

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Q.4 Suppose the charge of a proton and an electron differ slightly. One of them is −e, the other is (e + Δe). If the net of electrostatic force and gravitational force between two hydrogen atoms placed at a distance d (much greater than atomic size) apart is zero, then Δe is of the order of
[Given : mass of hydrogen $m_h = 1.67 \times 10^{-27}$ kg]

[NEET 2017]

(1) 10^{-23} C (2) 10^{-37} C (3) 10^{-47} C (4) 10^{-20} C

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Q.5 Two identical charged spheres suspended from a common point by two massless strings of lengths l, are initially at a distance d ($d \ll l$) apart because of their mutual repulsion. The charges begin to leak from both the spheres at a constant rate. As a result, the spheres approach each other with a velocity v. Then v varies as a function of the distance x between the spheres, as [NEET 2016 (Phase 1)]

(1) $v \quad x^{-1/2}$ (2) $v \quad x^{-1}$ (3) $v \quad x^{1/2}$ (4) $v \quad x$

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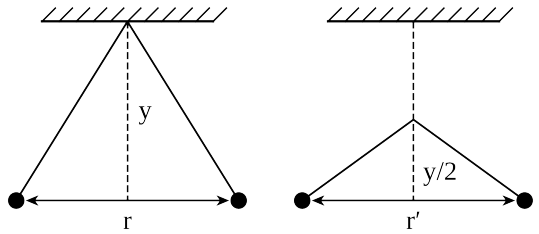
Q.6 Two pith balls carrying equal charges are suspended from a common point by strings of equal length, the equilibrium separation between them is r. Now the strings are rigidly clamped at half the height. The equilibrium separation between the balls now becomes [NEET 2013]



(1) $\left(\frac{2r}{\sqrt{3}}\right)$ (2) $\left(\frac{2r}{3}\right)$

(3) $\left(\frac{1}{\sqrt{2}}\right)^2 r$ (4) $\left(\frac{r}{\sqrt[3]{2}}\right)$

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Q.7 Two positive ions, each carrying a charge q, are separated by a distance d. If F is the force of repulsion between the ions, the number of electrons missing from each ion will be (e being the charge on an electron) [AIPMT 2010 (Prelims)]

(1) $\frac{4\pi\varepsilon_0 F d^2}{e^2}$ (2) $\sqrt{\frac{4\pi\varepsilon_0 F e^2}{d^2}}$

(3) $\sqrt{\frac{4\pi\varepsilon_0 F d^2}{e^2}}$ (4) $\frac{4\pi\varepsilon_0 F d^2}{q^2}$

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Q.8 The unit of permittivity of free space, ε_0, is [AIPMT 2004]

(1) coulomb/newton-metre

(2) newton-metre^2/coulomb^2

(3) coulomb^2/newton-metre^2

(4) coulomb^2/(newton-metre)^2

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Q.9 An electron 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 [AIPMT 2003]

(1) $K\frac{e^2}{r^2}\hat{r}$ (2) $-K\frac{e^2}{r^3}\hat{r}$ (3) $K\frac{e^2}{r^3}\hat{r}$ (4) $-K\frac{e^2}{r^2}\hat{r}$

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9		
Ans.	**2**	**2**	**3**	**2**	**1**	**4**	**3**	**3**	**4**		