Physicsaholics

DPP – 1 (Electrostatics)

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Q 1. The minimum electrostatic force between two charged particles placed at a distance of 1 m is:

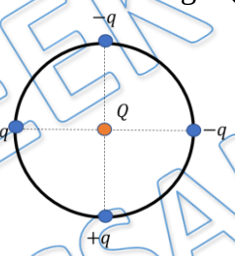
a) 2.3×10^{-28} N b) 6.2×10^{-34} N

c) 1.02×10^{-26}N d) 4.2×10^{-27}N

Q 2. If the distance between two point charges is increased by 3%, then calculate percentage decrease in force between them.

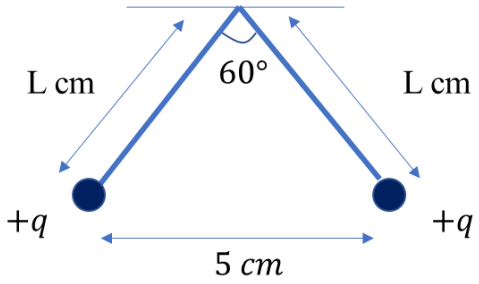
a) 3 % b) 5.7 % c) 9 % d) 1.5 %

Q 3. In the given figure calculate the force on charge Q placed at centre of circle of radius r.



(a) $\frac{1}{\sqrt{2}\pi\varepsilon_0}\frac{qQ}{r^2}$ (b) $\frac{1}{2\sqrt{2}\pi\varepsilon_0}\frac{qQ}{r^2}$ (c) $\frac{1}{\sqrt{2}\pi\varepsilon_0}\frac{qQ}{r}$ (d) $\frac{1}{8\pi\varepsilon_0}\frac{qQ}{r^2}$

Q 4. Two identically charged point spheres of mass 10 gm are suspended by thread of length L cm as shown in the figure. Calculate the charge on each sphere, If the distance between balls at equilibrium is 5 cm. [given: $(3)^{\frac{5}{4}} \approx 4$]



a) $12.5 \times 10^{-9}\ C$ b) $12.5 \times 10^{-8}\ C$ c) $12.5 \times 10^{-7}\ C$ d) $12.5 \times 10^{-6}\ C$

Q 5. The force between two charges when separated by a distance of 50 cm in air is 40 newtons. What will be the force between them if the distance becomes 25 cm?

a) 160 N b) 80 N c) 20 N d) 120 N

Q 6. A charge q is placed at the centre of the line joining two charges Q. The system of three charges will be in equilibrium if q is equal to

a) $-\frac{Q}{2}$ b) $-\frac{Q}{4}$

c) $+\frac{Q}{2}$ d) $+\frac{Q}{4}$

Q 7. A force F is acting between charges placed in vacuum. If the glass plate of dielectric constant K = 6 is now placed between them, the net force on charges now will be:

a) $6F$ b) $\frac{F}{6}$ c) $Zero$ d) $\frac{F}{36}$

Q 8. Three charges each of 5×10^{-6} coloumbs are placed at vertex of an equilateral triangle of side 10 cm. The force exerted on the charge of 1 μC placed at centre of triangle in Newton will be:

a) 13.5 b) zero c) 4.5 d) 6.75

Q 9. Three charges of equal magnitude are placed at three corners of square. If the force acting between q_1 and q_2 (placed along a side) is F_{12} and that between q_1 and q_3 (placed along a diagonal) is F_{13} then the ratio of $\frac{F_{12}}{F_{13}}$ will be:

a) $\frac{1}{2}$ b) $\frac{1}{\sqrt{2}}$ c) 2 d) $\sqrt{2}$

Q 10. At all the four corners of a square a charge + q is placed. What should be the value of charge which is to be placed at the centre of square such that the entire system will be in equilibrium:

a) 5q b) -5q c) -0.96q d) q

Answer Key

Q.1 a	**Q.2 b**	**Q.3 a**	**Q.4 b**	**Q.5 a**
Q.6 b	**Q.7 b**	**Q.8 b**	**Q.9 c**	**Q.10 c**