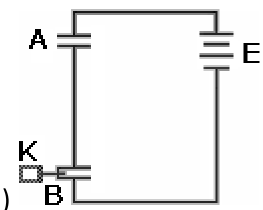
Guess Paper – 2014
Class – XII
Subject –Physics

Identical capacitors A and B, each of capacitance ‘C’ are connected in series. The combination is connected to a battery of emf E. A dielectric slab of dielectric constant K is slipped between the plates of capacitor B to cover entire space between the plates (fig.)



Ratio of potential differences across B before and after the introduction of dielectric slab in B will be

a) 1 : 1 b) K : 1 c) (K + 1) : 2 d) K + 1 : 2K

After introduction of dielectric slab in B, the ratio of potential differences across A and B will be

a) 1 : 1 b) 1 : K c) K : 1 d) 1 : √K

After introduction of dielectric slab in B, the ratio of potential differences across A and B will be

a) 1 : 1 b) K : 1 c) (K + 1) : 2 d) K + 1 : 2K

Two condenser of capacities 2C and C are joined in parallel and charged up to potential V. The battery is removed and the condenser of capacity C is filled completely with a medium of dielectric constant K. The potential difference across, the capacitor will now be

a) 3V / K + 2 b) 3V / K c) V / K + 2 d) V / K

Two metal plates from a parallel plate capacitor. The separation between the plates is d. Now half of the separation between the plates is filled with a dielectric of relative permittivity 2 and of same area. The new arrangement gets punchered when a potential difference just exceeding 1200 V is applied

a) 300V b) 400V c) 600V d)800V

Two metal plates from a parallel plate capacitor. The separation between the plates is d. Now half of the separation between the plates is filled with a dielectric of relative permittivity 2 and of same area. The new arrangement gets punchered when a potential difference just exceeding 1200 V is applied

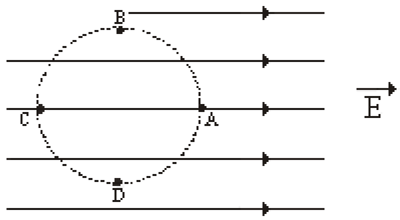
The ratio of capacitance before and after insertion of dielectric is :

a) 1 : 2 b) 2 : 1 c) 3 : 4 d) 4 : 3

Which of the following is the SI unit of electric field?

a) N b) N x C c) N / C d) N/m^2

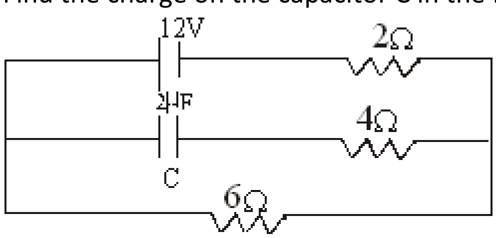
The electric field in a region surrounding the origin is uniform and along the x-axis. A small circle is drawn with the centre at the origin



cutting the axes at points A, B, C, D having co – ordinates (a , 0); (0 , a); (-a, 0); (0, -a) respectively as shown in the figure. Then the potential is minimum at the point

a) A b) B c) C d) D

Find the charge on the capacitor C in the following circuit:



a) 12 μC b) 14 μC c) 20 μC d) 18 μC

Two insulated charged conducting spheres of radii 20 cm and 15 cm respectively and having an equal charge of 10μC are connected by a copper wire and then they are separated. Then

a) Both spheres will have equal charges b) Surface charge density on the 20 cm sphere will be greater than that on the 15 cm sphere c) Surface charge density on the 15 cm sphere will be greater than that on the 20 cm sphere d) Surface charge density on the two spheres will be equal

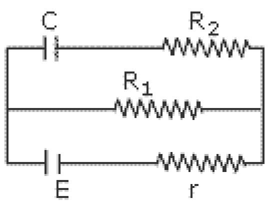
A solid conducting sphere having a charge Q is surrounded by an uncharged concentric conducting spherical shell. The potential difference between the surface of solid sphere and the shell is V. The shell is now given a charge -3Q. The new potential difference between the same surface will be

a) V b) 2V c) 4V d)-2V

Two isolated spheres having capacitances c_1 and c_2, potentials v_1 and v_2, charges q_1 and q_2 are connected by a conducting wire. After connecting, if new charges on spheres are q^1 and q^2, then q^1 / q^2 will be

a) c_1 / c_2 b) q_1 / q_2 c) v_1 / v_2 d) $(c_1v_1 + c_2v_1) / (c_1 + c_2)$

The numerical value of the charge on either plate of capacitor C shown in fig is



a) CE b) $CER_1 / (R_1 + r)$ c) $CER_2 / (R_2 + r)$ d) $CER_1 / (R_2 + r)$

There is an electric field E in X - direction. If work done in moving a charge 0.2 C through a distance of 2 m along a line making an angle of 60° with X - axis is 4.0 joule, What is the value of $\vec{E}$?

a) $\sqrt{3}$newton per coulomb b) 4 newton per coulomb c) 20 newton per coulomb d) None of these

In an arrangement of two concentric conducting shells, with centre at origin and radii a and b (a < b), charges Q_1 and Q_2 are given to the inner and outer shell respectively. Answer the question assuming that at infinite distance from origin, potential is taken as zero.

There will be a constant potential at any point inside the inner shell for

a) $Q_1 = -Q_2$ b) $aQ_1 = -bQ_2$ c) $bQ_1 = -aQ_2$ d) Any values of Q_1 and Q_2

In an arrangement of two concentric conducting shells, with centre at origin and radii a and b (a < b), charges Q_1 and Q_2 are given to the inner and outer shell respectively. Answer the question assuming that at infinite distance from origin, potential is taken as zero.

The potential of the inner shell is

a) $V = \frac{kQ_1}{a} + \frac{kQ_2}{b}$ b) $V = \frac{kQ_1}{r} + \frac{kQ_2}{b}$ c) $V = \frac{kQ_1}{a} + \frac{kQ_2}{r}$ d) $V = \frac{k(Q_1 + Q_2)}{b}$

Paper Submitted by:

Name: Shetanshu shekhar

Email: shekfuroven@rediffmail.com

Phone No. 9463587187