Electrostatic Potential And Capacitance

Q.No.1:
A parallel-plate capacitor is charged to a potential difference V by a dc source. The capacitor is then disconnected from the source. If the distance between the plates is doubled, state with reason how the following change:
(i) electric field between the plates
(ii) capacitance, and
(iii) energy stored in the capacitor

CBSE Board Paper 2010

Q.No.2:
Why should electrostatic field be zero inside a conductor?

CBSE Board Paper 2012

Q.No.3: An electric dipole of length 1 cm, which placed with its axis making an angle of 60° with uniform electric field, experience a torque of $6\sqrt{3}$ Nm. Calculate the potential energy of the dipole if it has charge ±2 nC.

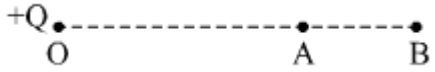
CBSE Board Paper 2014

Q.No.4: Two capacitors of unknown capacitances C_1 and C_2 are connected first in series and then in parallel across a battery of 100 V. If the energy stored in the two combinations is 0.045 J and 0.25 J respectively, determine the value of C_1 and C_2. Also calculate the charge on each capacitor in parallel combination.

CBSE Board Paper 2015

Q.No.5: A point charge $+Q$ is placed at point O, as shown in the figure. Is the potential difference $V_A - V_B$ positive, negative or zero?

CBSE Board Paper 2016



Q.No.6:

A hollow metal sphere of radius 10 cm is charged such that the potential on its surface is 5 V. What is the potential at the centre of the sphere?

CBSE Board Paper 2011

Q.No.7:

(i) Net capacitance of three identical capacitors in series is 2 μF. What will be their net capacitance if connected in parallel?

(ii) Find the ratio of energy stored in the two configurations if they are both connected to the same source.

CBSE Board Paper 2011

Q.No.8:

What is the geometrical shape of equipotential surfaces due to a single isolated charge?

CBSE Board Paper 2013

Q.No.9:

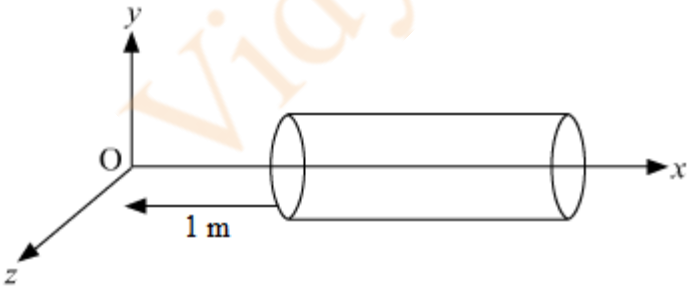
A capacitor of unknown capacitance is connected across a battery of V volts. The charge stored in it is 300 μC. When potential across the capacitor is reduced by 100 V, the charge stored in it becomes 100 μC. Calculate The potential V and the unknown capacitance. What will be the charge stored in the capacitor if the voltage applied had increased by 100 V?

OR

A hollow cylindrical box of length 0.5 m and area of cross-section 25 cm^2 is placed in a three dimensional coordinate system as shown in the figure. The electric field in the region is given by $\vec{E} = 20x\hat{i}$, where E is NC^{-1} and *x* is in metres. Find

(i) Net flux through the cylinder.

(ii) Charge enclosed by the cylinder.



CBSE Board Paper 2013

Q.No.10:

Draw a plot showing the variation of (i) electric field (E) and (ii) electric potential (V) with distance r due to a point charge Q.

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