

E-1

A cone with a circular base of radius 2.00 cm and height 3.00 cm is situated in a uniform electric field of magnitude 3.5×10^4 N/C making an angle 40° with the perpendicular to the base. There is no charge inside the cone. What is the flux through the sides of the cone.

Ans. $33.7 \text{ N m}^2/\text{C}$

E-2

Two charged concentric cylinders of infinite length have radii 4.00 and 6.00 cm. The charge per unit length on the inner cylinder is 2.0×10^6 C/m and on the outer cylinder -2.0×10^6 C/m. Find the electric field at a point 5.00 cm from the axis of the cylinder.

E-3

The intensity of the earth's electric field near its surface is 130 N/C, pointing toward the center of the earth. What is the charge of earth, assuming it is uniformly distributed?

E-4

What is the electric field between two parallel plate infinite planes of charge, one with a charge per unit area 6×10^{-7} C/m² and the other with charge per unit area 9×10^{-7} C/m²?

E-5

A conducting spherical shell of radius 10 cm carries a net charge of $-2 \mu\text{C}$ uniformly distributed on its surface, Find the electric field at a point 15 cm away from the center of the shell.

E-6

A square sheet of copper of sides 20 cm is placed in an extended electric field of $5 \times 10^3 \text{ N/C}$ directed perpendicular to the sheet. Find the charge density of each face of the sheet.

E-7

A solid conducting sphere of radius [a] has a net positive charge of [3 Q]. Concentric with this sphere is a thin conducting spherical shell of radius [b > a] which has a net negative charge of magnitude Q. Find the electric field at a distance 3b.

E-8

A point charge is placed at the center of an uncharged hollow conducting sphere. The inside radius of the sphere is [a], and the outside radius is [b], What is the induced charge per unit area on the inner surface of the hollow sphere?