APPLICATION OF GAUSS LAW – PROBLEM SESSION

Problem-1

- Consider a coaxial cable where radius of the inner conductor is *a* and that of outer conductor is *b*. The length of the conductor is L and line charge density of the inner conductor is ρ_L. Determine the electric field **E** in terms of ρ_L at the region:

a) Between the two conductors of the coaxial cable
b) Outside the coaxial cable

Problem-2

- If $\mathbf{D} = (2y^2 + z)\mathbf{a_x} + 4xy\mathbf{a_y} + x\mathbf{a_z}$ C/m^2, find

a) The volume charge density at $(-1, 0, 3)$
b) The flux through the cube defined by $0 \leq x \leq 1, 0 \leq y \leq 1, 0 \leq z \leq 1$
c) The total charge enclosed by the cube

Problem-3

- A charge distribution in free space has ρ_v = 2r nC/m^3 for $0 \leq r \leq 10$m and zero otherwise. Determine **E** at r = 2m and r = 12m