

QUIZEN – Electrostatics CCWS12P01.3

Learning Level 1	Learning Level 2	Learning Level 3
Q - Remembering (knowledge-based questions) U - Understanding (comprehension-based questions)	I - Applying (application-based questions) Z - Analyzing (analysis-based questions)	E - Evaluating (evaluation-based questions) N - Creating (creation-based questions)

Learning Level 1

1. Define electric flux and give its SI unit.
2. State Gauss's law in electrostatics.
3. What is the net electric flux through a closed surface that encloses a point charge q ?
4. Explain how to use Gauss's law to find the electric field due to a uniformly charged spherical shell.
5. A point charge $+q$ is located at the center of a closed Gaussian surface. What is the electric flux through the surface?

Learning Level 2

6. A point charge $+q$ is located at the center of a uniformly charged spherical shell of radius R and total charge Q . Use Gauss's law to find the electric field at a point inside the shell, at a distance r from the center ($r < R$).
7. A conducting sphere of radius R has a total charge Q uniformly distributed on its surface. Use Gauss's law to find the electric field at a point inside the sphere, at a distance r from the center ($r < R$).
8. A point charge q is placed at a distance d from a uniformly charged infinite plane. Use Gauss's law to find the electric field at a point on the plane.
9. A long charged cylinder of radius R has a uniform charge density ρ . Use Gauss's law to find the electric field at a point inside the cylinder, at a distance r from the axis ($r < R$).

10. A point charge $+q$ is located at the center of a square of side a . The square lies in the xy plane and is centered at the origin. Use Gauss's law to find the electric flux through each face of the square.

Learning Level 3

11. A hollow metal sphere of radius R has a total charge Q uniformly distributed on its surface. Use Gauss's law to find the electric field at a point outside the sphere, at a distance r from the center ($r > R$).

12. A long charged cylinder of radius R has a linear charge density λ that varies with distance r from the axis according to the equation $\lambda = \lambda_0 (1 - r/R)$, where λ_0 is a constant. Use Gauss's law to find the electric field at a point inside the cylinder, at a distance r from the axis ($r < R$).

13. A point charge $+q$ is located at a distance d from an infinite line of charge with linear charge density λ . Use Gauss's law to find the electric field at a point on the line.

14. A uniformly charged solid sphere of radius R has a total charge Q . Use Gauss's law to find the electric field at a point inside the sphere, at a distance r from the center ($r < R$).

15. A point charge $+q$ is located at the center of a closed Gaussian surface consisting of two concentric spheres of radii R_1 and R_2 ($R_1 < R_2$). Use Gauss's law to find the electric flux through the surface.