

Gauss's Law Assignment 1

Question 1

A point charge (Q) is located at the centre of a cube of edge length a , find the final electric flux over one face of the cube

- a. Q/ϵ_0
- b. $Q/6\epsilon_0$
- c. $6Q/\epsilon_0$
- d. none of the above

Question 2

Three point charges $q + Q$, q , $q - Q$ are enclosed by the surface S . What the net flux crosses S

- a. $3q$
- b. $2q$
- c. $3q - Q$
- d. can not be determine based on the data given in question

Question 3

Find the electric field inside the sphere which carries a charge density proportional to the distance from the origin

$$\rho = kr$$

- a. ρ/ϵ_0
- b. $\rho r/\epsilon_0$
- c. $\rho r^2/\epsilon_0$
- d. none of the above

Question 4

A point charge $Q(C)$ is placed at the origin. Find the electric flux of which an area $4\pi m^2$ on a concentric spherical shell of radius R

- a. $Q/R^2\epsilon_0$
- b. Q/ϵ_0
- c. $Q/4R^2\epsilon_0$
- d. none of the above

Question 5

As per Gauss law

$$\int \mathbf{E} \cdot d\mathbf{S} = q_{in}/\epsilon_0$$

Which of the following is true about this

- a. This is valid for symmetrical surface only
- b. E is the electric field to the charge inside the surface
- c. Electric flux on the closed surface due to outside charge is always zero
- d. none of the above

Question 6

A uniform line charge with linear density λ lies along the y-axis. What flux crosses a spherical surface centered at the origin with $r = R$

- a. $2R\lambda/\epsilon_0$
- b. $R\lambda/\epsilon_0$
- c. λ/ϵ_0
- d. none of the above

Answers:-

- 1. (b)
- 2. (a)
- 3. (b)
- 4. (a)
- 5. (c)
- 6. (a)