

DAV PUBLIC SCHOOL, SECL BISHRAMPUR
SESSION: 2026-27
SUMMER VACATION HOME WORK
CLASS-XII
Subject : Physics

Electrostatics

Section A: MCQs (1 mark each)

1. The force between two charges is doubled if:
 - a) Distance is doubled
 - b) Distance is halved
 - c) Charges are halved
 - d) Charges are doubled

2. Electric field intensity at a point due to a point charge depends on:
 - a) Charge only
 - b) Distance only
 - c) Both charge and distance
 - d) Medium only

3. Electric field lines:
 - a) Intersect each other
 - b) Are always circular
 - c) Never intersect
 - d) Start from negative charge

4. SI unit of electric flux is:
 - a) N/C
 - b) Nm^2/C
 - c) Joule
 - d) Volt

5. Gauss's law is valid for:
 - a) Only symmetric charge distribution
 - b) Only point charges
 - c) All closed surfaces
 - d) Only spherical surfaces

Section B: Assertion-Reason (2 marks each)

6. Assertion: Electric field inside a conductor is zero.
Reason: Charges reside only on the surface.

7. Assertion: Electric field lines are perpendicular to conductor surface.
Reason: Otherwise charges would move.
8. Assertion: Flux depends on enclosed charge.
Reason: Flux depends on total field lines entering surface.
9. Assertion: Electric field due to infinite plane sheet is constant.
Reason: Field depends on distance.
10. Assertion: Net flux through closed surface can be zero.
Reason: No charge is enclosed.

Section C: Short Answer (2–3 marks)

11. Define electric field and write its SI unit.
12. Write Coulomb's law in vector form.
13. What is electric flux? Write its formula.
14. State Gauss's theorem.
15. Define electric dipole and write expression for electric field on axial line.

Section D: Case-Based Questions (4 marks each)

Case Study 1:

A spherical Gaussian surface encloses a charge of $+5 \mu\text{C}$.

- 16.
- Calculate electric flux through surface.
 - What happens if radius is doubled?
 - What if charge is outside surface?

Case Study 2:

Two point charges $+q$ and $-q$ are placed at distance d forming a dipole.

- 17.
- Define dipole moment.
 - Direction of electric field at equatorial line?
 - What happens to field if distance increases?

Section E: Long Answer Questions (5 marks each)

18. Derive expression for electric field due to a point charge using Coulomb's law.

19. Using Gauss's theorem, derive electric field due to infinite plane sheet of charge.

20. Derive expression for electric field inside and outside a uniformly charged spherical shell using Gauss's law.