PHYSICS

BOOKS - BETTER CHOICE PUBLICATION

GAUSS'S THEOREM

VERY SHORT ANSWER TYPE QUESTIONS

1. What is the unit of solid angle ?

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2. Define Gauss's theorem in electrostatics.

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3. Write down a relation between electric flux and electric field intensity.

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4. What do you mean by electric flux ? Write its Sl-unit.

5. A box enlcoses an electrical diple consisting of charge $5\mu C$ and $-5\mu C$ and of length 10 cm. What is the total electric flux through the box?

MOST EXPECTED QUESTIONS

1. Is electric flux a scalar or a vector? Give the SI untis of electric flux.

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2. A box enlcoses an electrical diple consisting of charge $5\mu C$ and $-5\mu C$ and of length 10 cm. What is the total electric flux through the box?

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3. Gauss's theorem

4. How does electric field at a point change with distance r from an infinite thin sheet of charge?

5. A sensitive instrument is to be shielded from the strong electrostatic fields in its environment. Suggest a possible way.

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6. What is a gaussian surface?

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7. Supose a gaussian surface does not include any net charge. Does it necessarily mean that E is equal to zero for all points on the surface?

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8. What do you mean by positive flux and negative flux ?

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9. If the electric flux entering and leaving an enclosed surface is ϕ_1 and ϕ_2 respectively then what is the electric charge inside the surface ?

10. Supose a gaussian surface does not include any net charge. Does it necessarily mean that E is equal to zero for all points on the surface?

1. What is the use of Gaussian surface in electrostatics ?

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2. What is the importance of Gauss'theorem in electrostatics ?

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3. State and prove Gauss's theorem in electrostatics.

4. Using Gauss's law, determine the electric field intensity due to a long thin wire of uniform charge density.

5. State Gauss' law in electrostatics. Using this law, derive an expression for the electric field due to an infinitely long straight charged wire at a point distant r from it. Plot a graph showing the variation of electric field with r.

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6. State Gauss' theorem in electrostatics. Derive an expression for the electric field

intensity at any point of to an infinite plane sheet of charge.

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7. State Gauss's theorem.How Coulomb's law can be derived from it ?

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8. What is electriG flux ? Explain how the electric flux through a surface is related to

electric field intensity, when the surface is heldinside the electric field.

LONG ANSWER TYPE QUESTIONS

1. State Gauss' law and using this law , derive an expression for the electric field intensity due to a uniformly charged thin spherical shell at a point outside the shell.

2. Derive expression for the electric field due to a uniformly charged spherical shell at a point outside the shell.

3. State Gauss's theorem with the help of diagram, derive an expression for the electric field intensity due to uniformly charged thin spherical shell at a point inside

4. State Gauss's theorem with the help of diagram, derive an expression for the electric field intensity due to uniformly charged thin spherical shell at a point outside

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5. State Gauss' theorem in electrostatics. Using it, derive an expression for the electric charged thin spherical shell at a point inside

6. State Gauss' theorem in electrostatics. Derive an expression for the electric field intensity at any point of to an infinite plane sheet of charge.

7. State Gauss' theorem in electrostatics. Derive an expression for the electric field

intensity at any point of to an infinite plane sheet of charge.

8. State Gauss' theorem in electrostatics. Using it, derive an expression for the electric charged thin spherical shell at a point inside

9. State Gauss' theorem in electrostatics. Derive an expression for the electric field intensity at any point of to an infinite plane sheet of charge.

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MOST EXPECTED NUMERICALS

1. A box encloses an electric dipole of $3\mu C$ and $-3C$, if the dipole length is 6 cm,

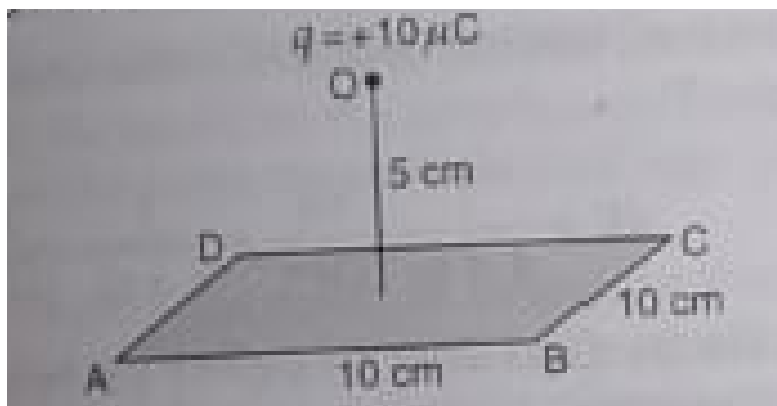then find total electric flux associated with box.

2. A point charge of $4\mu C$ is at the centre of a cube gaussian surface whose each side is 2 cm. What is the net electric flux through the surface ?

3. A point charge $+10\mu C$ is at a distance 5 cm directly above the centre of a square of side 10 cm as show in the figure.

What is the magnitude of the electric flux through the square?

4. An infinite line charge produces a field of $9 \times 10^4 N/C$ at a distance of 2 cm. Calculate the linear charge density.